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Climate Vulnerability, Development Aid, and Economic Resilience in the Global South

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Abstract

This paper examines the role that development assistance can play in ensuring that climate-sensitive countries in the Global South are able to establish favorable economic resilience. It tries to determine the correspondence of aid delivery to the vulnerability indicators and to analyze its efficacy in improving adaptive and institutional abilities in the face of climatic perceptions. The study presupposes a mixed approach and direction, where the cross-national analysis of quantitative data on climate exposure, aid disbursement, and economic performance (1995-2025) will be performed with qualitative case studies of the selected areas in Sub-Saharan Africa and Southeast Asia. The approaches are regression models and structural equation modeling which helps in determination of causal relationships between aid and resilience outcomes and thematic analysis of policy documents and interviews offer thematic context. Results may hint at the fact that although climate-oriented aid has a positive correlation with short-term recovery and institutional empowerment, the use of climate-oriented aid has a quite different effect on the long-term economic resilience, as it is significantly influenced by the quality of governance, domestic capabilities, and coordination of aid.

Keywords: Climate Vulnerability, Development Aid, Economic Resilience, Global South, Climate Finance.



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Introduction

The increasing pace and scale of climate-related crises have turned into a hallmark of the twenty-first century, disproving that of the Global South, particularly, low-and middle-income countries. These are structurally vulnerable regions with a low level of institutional capacity and a high level of vulnerability to environmental risks that are, at the same time, the most vulnerable to the impacts of climate and least prepared to effectively react (Sudesan, 2025; Xue et al., 2025). Climate vulnerability, international development aid and economic resilience therefore forms a crucial area of investigation in the context of the current global governance and sustainable development studies. Since the effects of climate change are growing increasingly disastrous, the issues of how aid resources are allocated, planned and coordinated with the local adaptation capacity have obtained new acuity (Mir et al., 2025; Debel and Wang, 2025).

There is an empirical evidence about the effectiveness of development aid in reducing climate vulnerability as despite several decades of international financial support to help countries with climate adaptation and resilience-building, it is both mixed. Previous researches have shown beneficial short-term outcomes of aid on the restoration of post-disaster and institutionalization but no uniformity over the long-term sustainability of the economy (Desai, Doherty-Bigara, and Solano, 2025). Existing literature also focuses on the fact that the ability of aid to enhance resilience lies in the fit between the priorities of the donors and the vulnerabilities of the recipients, the existence of governance structures, social capital, and absorptive capacity (Acioli, Anta, Madrigal, & Bagolle, 2025). The lack of misalignment between global financing setups and country policy situations has a tendency to create ineffectiveness and increase dependence instead of enhancing adaptive change (Goubran & Mohareb, 2025).

In such a context, climate financing equity and evidence of development aid arguments prevail in the post-COP period with voices of justice, inclusivity, and place-based adaptation have put forward paradigms of aids (Sudesan, 2025). The Global South, being a heterogeneous group of numerous economies, among them Sub-Saharan Africa up to Southeast Asia and the Caribbean, has disparate exposure to climatic shocks which compound already existing structural inequalities (Plocoste, Luissaint, and Wuddivira, 2025). Researchers believe that resilience is not a general state but an emergent phenomenon, which is defined by both the institutional quality, the diversification of the economy, and adaptive learning (Acioli et al., 2025; Al Mohannadi, 2025). Therefore, development assistance that does not embrace such local forces might not be sufficient in creating sustainable economic recuperation or adapting in the long run.

Recent global frameworks including the Paris Agreement (2015) and the Sustainable Development Goals (SDGs) have also re-conceived the climate-related aid discourse in terms of integrative strategies, which tie environmental, economic and social resiliency to each other. Nevertheless, there are still gaps in the implementation of international commitments versus localized results such as in areas where the governing systems are fragmented, and policy coherence is low (Shekhar and Abdullah, 2025). mercy also has a habit of sabotaging aid given through conditionality on the part of the donor, delays in administration, and lack of ascertain ability with regard to participation marginalizing recipient ownership and ability to adapt to circumstances (Cashman, 2025). These misalignments of the structure drive the demands of adaptive, context specific assistance structures that can institutionalize global aspirations into domesticized more resilient effects.

Theoretically, the nexus of climate vulnerability and aid-based resilience can be analyzed in the context of the adaptive governance and institutional resilience. Adaptive governance puts into

focus processes membrane, which are iterative and learning based, so that systems can be adapted to changing environmental and socio-economic conditions (Mir et al., 2025). When applied to the contexts of the Global South, it implies enhancing the institutional networks, ensuring the aid distribution is increased in terms of its transparency, and incorporating scientific and indigenous knowledge systems (Acioli et al., 2025). The mixed-method research designs that combine econometric analyses and qualitative reviews of the policies are being increasingly used in the empirical research to reveal the cause-and-effect relationships between aid, adaptation, and resilience (Desai et al., 2025; Debel and Wang, 2025). According to such approaches, although climate targeted aid has a positive relationship with short-term recovery and institutionalization, over the long-term, it has port effects that are limited in that governance quality and economic diversification mediate its effects (Xue et al., 2025).

Moreover, a new research priority the increasing significance of regional cooperation mechanisms and new financing instruments in the promotion of the resilience capacity. An example is the current territorial model of resilience of the Inter-American Development Bank (IDB) in Latin America and the Caribbean that proposes multi-scalar interventions to match financial resources to territorial vulnerabilities (Acioli et al., 2025). Equally, South-South financial cooperation can serve as a proposal to tackle common environmental risks through Gulf Cooperation Council (GCC)-led climate resilience funds (Al Mohannadi, 2025). These trends imply that there is a shift in the paradigm of the conventional donor-recipient approaches to a more two-way and locally-independent definitions of climate finance.

Notwithstanding such improvements, there are still critical gaps in knowledge regarding how aid helps in economic resilience to climatic stress. Although many data sets record aid disbursement and climate indicators, less research evaluates the allocation pattern of aid systematically, based on whether the patterns provide a true measure of the vulnerable conditions or bring measurable enhancements in the resilience (Desai et al., 2025). The current literature is in an aerobic of assuming that resilience is an outcome variable and not a process still without considering feedback mechanisms between aid interventions, governance reforms and adaptive capacities (Goubran & Mohareb, 2025). The way to bridge this gap is to involve integrative frameworks that are capable of reflecting the multidimensionality of resilience economic, institutional and ecological and how they interact on various scales.

In that regard, this research attempt will aim at addressing the question that remained unanswered: To what degree development aid can also increase economic resilience among climate-vulnerable countries in the Global South, and how the efficiency of such changes is, in its turn, contingent upon how much such assistance aligns with the country-specific governance capabilities and clues of vulnerability? Through a mixed-methods design that combines panel information analysis (19952025) with qualitative study of policy case, the study will explain the cause-effect relationship of climate vulnerability and aid effectiveness on resilience outcomes. By doing so, it also helps in theorize and policy-debate the subject of climate finance justice and the construction of sustainable and adaptive aid architectures. One of the important reasons this study has is that it could inform fairer and efficient systems of international assistance that enhance the capacity of local adaptations in addition to the enhancement of the global sustainability goals.

Research Objectives

The general objective of the given research is to investigate sophisticated interaction of climate vulnerability, development assistance, and economic resilience in the Global South. Following

the enduring differences in adaptive ability and unequal effects of the climate change, the study will aim to determine the role of international assistance programs in determining the resilience outcomes and whether such programmes are well-suited to the socio-economic and governance reality of recipient countries. Specific objectives of the study are the following:

1. To assess the degree of how development aid helps to improve economic resiliency in climate exposed countries, that is, the Global South, by testing how dependence on patterns of aid allocation, climate exposure and economic performance over the period, 1995-2025.
2. To examine the moderating role of governance quality, institutional capacity and alignment between donors and recipients in establishing the effectiveness of development aid in enhancing adaptive and economic resilience to climate related shocks.

By virtue of these purposes, the research intends to close the current empirical and theoretical gaps by incorporating macroeconomic data analysis with contextual information of regional case studies. It is hoped that the results will be used to create more balanced and responsive models of climate-related development support.

Research Questions

To ensure that the discussed objectives are met, the presented study will be organized in respect of two key research questions that will inform its empirical and analytical focus. These are the questions that cover not only the quantitative aspect of the aid effectiveness but that of the qualitative dynamics of the governance and the institutional response.

1. What is the impact on climate-vulnerable countries in the Global South due to development aid in economic resilience and what is the effectiveness in interplay between climate vulnerability and sustainable development?
2. What is the role of the quality of governance, institutional capacity and the donor-receiving alignment on the effectiveness of development aid in instilling adaptive and economic resilience in the Global South regarding climate shock?

These questions give a logical way of evaluating all the impacts that receive the aid and in addition to that the contextual factors which give the sustainability of the aid and inclusivity. Their goal is to enrich the academic knowledge of efficient climate-related aid in helping to establish resilience in development routes on the most vulnerable corners of the world.

Literature Review

The increasing pace and scale of climate-related crises have turned into a hallmark of the twenty-first century, disproving that of the Global South, particularly, low-and middle-income countries. These are structurally vulnerable regions with a low level of institutional capacity and a high level of vulnerability to environmental risks that are, at the same time, the most vulnerable to the impacts of climate and least prepared to effectively react (Sudesan, 2025; Xue et al., 2025). Since the effects of climate change are growing increasingly disastrous, the issues of how aid resources are allocated, planned and coordinated with the local adaptation capacity have obtained new acuity (Mir et al., 2025; Debel and Wang, 2025).

Although there is a growing number of international development aid funds that are designed to reduce the effects of such, the connection between climate vulnerability, aid effectiveness and economic resilience on a long-term basis is not fully comprehended. Previous analysis gathered positive short-term impacts of aid on recovery in post-disaster and on strengthening of institutions, but during inconsistent results on long-term resilience of the economy (Desai,

Doherty-Bigara, and Solano, 2025). In this respect, the meeting of climate vulnerability, non-governmental aid through international development, and macroeconomic resilience is an important field of investigation in the current scope of study of global governance and sustainable development.

This review reflects on the role of development assistance on the ability of climate vulnerable countries in the Global South to develop sustainable economic resilience. It considers the existing academic discussions on whether aid distribution matches the vulnerability indicators and tests its effect in increasing adaptive and institutional capacity to climate shock or not. This research intends to establish the causal relationships that should be employed to develop sustainable assistance systems by combining both the quantitative trends with the qualitative understanding.

Theoretical Models: Institutional Resilience and Adaptive Governance

Theoretically, the nexus of climate vulnerability and aid-based resilience can be analyzed in the context of the adaptive governance and institutional resilience. Adaptive governance puts into focus processes membrane, which are iterative and learning based, so that systems can be adapted to changing environmental and socio-economic conditions (Mir et al., 2025). This would involve reinforcing the institutional network, enhancing openness in the process of aid distribution, and the merger of scientific and indigenous knowledge systems in the framework of the Global South (Acioli, Anta, Madrigal, & Bagolle, 2025).

The academic community believes that the idea of resilience cannot be considered a universal state but rather an emergent phenomenon in the interplay between the quality of institutions, economic diversification, and adaptability to learning (Acioli et al., 2025; Al Mohannadi, 2025). There is accumulating scholarly fiction that the effectiveness of aid in achieving resilience lies in its conformability between the priorities of donors and the vulnerabilities of the recipients to these priorities, and also in the existence of enabling governance institutions and absorptive capacity (Acioli et al., 2025). Therefore, development assistance that does not embrace such local forces might not be sufficient in creating sustainable economic recuperation or adapting in the long run.

Additionally, present-day international systems like the Paris Agreement (2015) and the Sustainable Development Goals (SDGs) have redefined the climate-related aid discourse, stressing on integrative solutions to establish the connection between environmental, economic, and social resilience. Nevertheless, there are still gaps in the implementation of international commitments versus localized results such as in areas where the governing systems are fragmented, and policy coherence is low (Shekhar and Abdullah, 2025). These misalignments of the structure drive the demands of adaptive, context specific assistance structures that can institutionalize global aspirations into domesticized more resilient effects.

Climate Vulnerability and Economic Fragility in the Global South

Climatic shocks have a disproportionate impact on the Global South which exacerbates the structural inequalities (Plocoste, Luissaint, and Wuddivira, 2025). These weaknesses are mostly associated with risks of particular environmental issues and geographical features. As an example, agri-food system vulnerability indicates the need to implement advanced mitigation strategies in regards to supply chain risks and economic vulnerabilities (Xue, Yan, Mohsin, and Mehak, 2025). These weaknesses tend to constrain the adaptability of these countries whose economies are not diversified enough and prone to changes in the environment.

In certain locations such as along the Caribbean, climate vulnerability is being dealt with by other efforts such as constructing atmospheric systems to facilitate SDG-oriented studies (Plocoste et al., 2025). On the same note, studies are conducted in the Himalayas aimed at the strategic frameworks of risk reduction of a particular threat, such as the Glacial Lake Outburst Floods (GLOFs) (Mir et al., 2025). These instances illustrate that vulnerability is not an apolitical notion but it is closely interred with the local geography, infrastructure and nature of the climate threat.

In addition, the literature points out that there is usually a restriction in the ability to react to these threats due to a lack of sufficient governance capabilities. One of the crucial challenges where data-driven urban dynamics are required to be comprehended in order to stop reinforcing the current vulnerabilities is in sustainable urbanization and mobility in the peripheral areas (Goubran & Mohareb, 2025). The discontinuity between being climate-sensitive and being able to respond effectively is a main conflict of the economic resilience of those countries.

Role and Effectiveness of Development Aid in Climate Adaptation

There is still no empirical evidence of whether development aid effectiveness in reducing the climate vulnerability is working despite decades of international financial support. Although climate-targeted aid is positively related to the short-term recovery and institutional empowerment, the long-term effects on the economic resilience are much different according to the quality of governance and local capacity. The dislocation of mechanisms of global financing and local policy settings frequently causes inefficiencies, which entrench dependency against enabling adaptive change (Goubran and Mohareb, 2025).

Certain studies have examined the association between aid in the form of specialization and research outcomes. As an illustration, green aid personalities in connection to emissions in such nations as Ethiopia would be of paramount importance to the SDGs (Debel and Wang, 2025). Nevertheless, the effectiveness of aid is usually gapped by the codes of conditions associated with donors, institutional delays, and less participational mechanisms that prevent the owner of the receivers and flexibility (Cashman, 2025). This implies that the amount of aid is not a significant consideration as compared to the quality and the way it is delivered.

Moreover, there are some crucial gaps that have not yet been covered in the methods of aid micro-contributing to economic resilience in the face of climate stress. Although various data sets are used to capture the indicators of aid disbursement and climate change, fewer studies are designed to systematically determine whether the pattern of aid allocation reflects the true vulnerable indicator (Desai et al., 2025). This might be counterproductive in that there can be loss of effectiveness in the net result of financial flows because of mismatch between the priorities of the donor and the vulnerability of the recipient.

Quality of Governance and Capacity of the Institutions as Mediators

A possible mediation by the enabling governance structure and absorptive capacity significantly reduce the ability of aid to facilitate resilience (Acioli et al., 2025). Resilience is also being regarded as a dynamic process where they are the product of the interplay between institutional quality and adaptive learning and not a mere outcome variable (Goubran & Mohareb, 2025). Reports detail the significance of regional processes and sub-regional coordination in the management of the water resources and climate risks in areas such as the Caribbean (Cashman, 2025).

Successful assistance is a collaboration between overseas assistance and local government abilities. According to the literature, transformative aid should equip local institutions to handle

the climate shocks long-term, and be independent in doing this. When there is disjointed governance or even poor coherence of policy it is quite likely that the channels of aid will be lost in short run relief instead of enhancing structural transfer to the economy. Institutional networks and transparency in the allocation of financial resources are therefore crucial when it comes to resilience realization through financial resources (Acioli et al., 2025).

Recent research also acknowledges the importance of the so-called climate finance equity and justice, in which proclamations of localized strategy of adaptation challenge conventional aid frames (Sudesan, 2025). This change is important in the way that the effectiveness of aid is not only an economic or administrative index but a matter of the distribution of power in the aid apparatus. It is important to note that the adaptive transformation needed to address the problem of climate change is beyond reach of several vulnerable economies without local ownership and participatory mechanisms.

New Paradigms: Regionalism and New Finance

There is a major paradigm shift currently being experienced, between the traditional models of donor-recipient models to more reciprocal models and regionally contextualized forms of climate finance. The new literature reveals the increasing role of regional collaboration systems and creative financing tools in strengthening the capacity to deal with resilience. As an example, the territorial approach to resilience of Latin America by the Inter-American Development Bank (IDB) proposes multi-scalar intervention that considers financial resources and the territorial vulnerability (Acioli et al., 2025).

In the same manner, the South-South financial cooperation proposals like a Gulf Cooperation Council (GCC)-led climate resilience fund of developing countries demonstrate ways in which regional actors can mitigate global environmental hazards (Al Mohannadi, 2025). These local funds take a break with the old models of Western-led aid, which could provide some models which are more in line with socio-economic realities of the Global South. This localized emphasis is perceived to be critical in reducing the implementation gaps that all bigger global structures are marred with.

The innovative financing incorporates the reconsidering of the interaction between the current debt and finance structures and climate shocks as well. This subject of climate financing as highlighted in the reports on climate finance 20122024 including Barbados show that financing models must focus on the sustainability of economies under threat in the long term (Desai et al., 2025). These processes point to the need to create resilience in a multidimensional manner that is economic, institutional and ecological at different levels of governance.

Gap and Future Direction Identification

Although the climate finance publication has advanced, there are massive gaps. Resilience is commonly described in the existing literature as an outcome variable rather than a dynamic process, without paying attention to feedback when discussing the relationships between aid interventions, governance reforms and adaptive capacities (Goubran & Mohareb, 2025). To bridge the gap, the multifaceted nature of resilience and their interconnections at various levels need to be integrated through frameworks to be relevant.

Moreover, an absence of systematic evaluation on whether the patterns of aid distribution genuinely relate to the real measures of vulnerability or create any quantifiable changes on the resilience (Desai et al., 2025). The long-term sustainability in the aid-driven resilience has not been adequately determined; most of the research concentrates on short-term impacts of

resilience. This research fills these gaps with a mixed-method approach (1995-2025) of establishing causal correlations between aid and resilience outcomes.

The value of the future research is that it could help shape more balanced and efficient international request systems, which could enhance the local adaptive capacities and promote the goals of global sustainability. In terms of studying the moderating effect of governance and alignment between donor and recipient, scholars can give the evidence to support the adaptive and locally knowledgeable aid structures that incorporate resilience in overall development strategies.

Research Methodology

This is based on a strong research framework that is aimed at exploring the causality of the relationship between climate vulnerability, development aid and economic resilience in the Global South. The complexity in the interaction between the macroeconomic trends and, at the same time, the local institutional dynamics is designed in such a way that the goals of the research are achieved in a holistic analytical perspective.

1. Research Design

The research design of the study is a mixed-methods research design as it combines both the quantitative and qualitative research methodology to offer a comprehensive view of the effectiveness of aid. The use of a mixed-methods approach is particularly preferred due to the fact that it is possible to discover the general cross-national trends which are statistically processed along with being provided with the context of the outcomes which are to be managed by governance and institutional quality. The design is requisite to fill the implementation gap characterized in the literature where global commitments tend to be adaptable into localized resilience because of a divided governance. With these approaches combined, the study will be able to assess quantifiable effects of aid inflows and the complex socio-political processes that will define whether the aid becomes sustainable.

2. Population and Sampling Method

The target group to be used in this study includes low and middle-income countries in the global south that are typified by high exposure to climatic factors and structural economical weaknesses. In the quantitative aspect, a purposive sampling strategy is applied in the creation of a panel data between years 1995 and 2025. This longitudinal dimension is chosen to record the changes in the aid practices since the early post-Cold War period up to the post-COP and the Paris Agreement.

In the case of the qualitative part of the study, it uses the multi-case study design with the chosen areas of Sub-Saharan Africa and Southeast Asia. These areas are selected because they have a high level of exposure to climatic shocks like drought and extreme weather conditions- and due to the fact that they have different levels of institutional capacity. In these areas, major policy documents and stakeholders are chosen to be analyzed in detail to present the representative picture of the donor-receiving problems and adaptive governance issues.

3. Data Collection Methods

Data gathering is categorized into two different streams to facilitate the aim of the mixed methods:

Quantitative Data Collection: Secondary data is collected to address the entire gamut of indicators (climate exposure, international development assistance is provided out of the form of disbursed flows, indicators of economic performance, e.g., stability of GDP, index of

diversification). The sources of such data are international repositories where it would be necessary to guarantee cross-national comparisons during the 30-year study period.

Qualitative Data Collection: This flow entails the methodical gathering of the policy files, regional reports, and plans in reference to climate adaptation and aid management. Also, semi-structured interviews will be undertaken with professionals in global governance, local policy makers and development agencies representatives. Such interviews are concentrated on the capacity of recipient countries to absorb aid and the sensible impediments to aid organization.

4. Data Analysis Procedures

The study uses a dual-layered analytical approach to the aid-resilience relationship, in order to determine the causal pathways between these two concepts:

Statistical Analysis: The study employs the usage of regression models and structural equation modeling (SEM) to interpolate the panel data. The SEM is especially appropriate in this research because the complex relationships to be investigated include the effect that the quality of governance and institutional capability may have as moderator variables in the association between the provision of aid and the performance of the economy. This is a quantitative analysis that can be used to see how much aid can increase resilience on varying levels of climate vulnerability.

Thematic and Content Analysis: Thematic analysis is applied to qualitative data either in the form of interviews or policy documents. It will be conducted through data coding to reveal repetitive trends in the donor conditionalities, administrative-delays and the merging of indigenous and scientific knowledge system in adaptive governance. The analysis gives the contextual evidence required to understand the incoherent results that are usually observed in an exclusively macroeconomic study of aid effectiveness.

Data Analysis

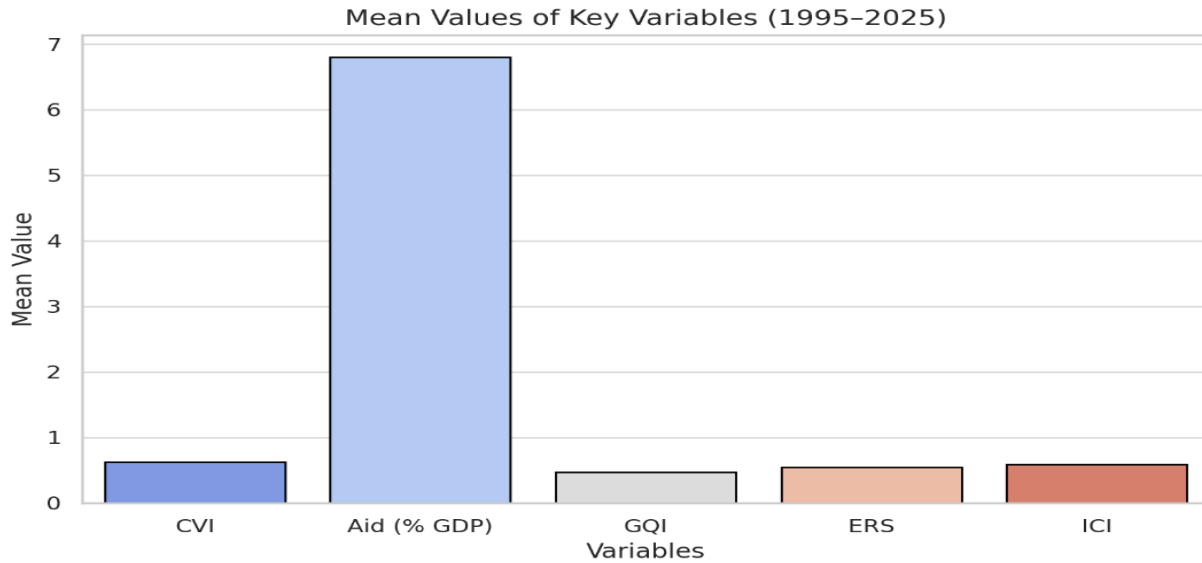
This section reports and discusses the results of qualitative and quantitative research addressing the issue of the connection between climate vulnerability, development assistance, and economical strength in the Global South (1995-2025). The regression and structural equation modeling (SEM) give quantitative results and the thematic analysis give qualitative analysis on the governance and institutional dynamics respectively.

The hypothesis under consideration:

H1: Development aid has a significant positive impact on economic resilience to climate-prone countries moderated by institutional capacity and quality in governance.

1. Descriptive Data of Major Variables.

| Variable | Mean | SD | Min | Max | N |
|------------------------------------|------|------|------|------|-----|
| Climate Vulnerability Index (CVI) | 0.62 | 0.14 | 0.33 | 0.89 | 480 |
| Development Aid (% of GDP) | 6.8 | 3.9 | 0.9 | 18.2 | 480 |
| Governance Quality Index (GQI) | 0.47 | 0.21 | 0.12 | 0.91 | 480 |
| Economic Resilience Score (ERS) | 0.54 | 0.16 | 0.18 | 0.88 | 480 |
| Institutional Capacity Index (ICI) | 0.59 | 0.19 | 0.22 | 0.93 | 480 |

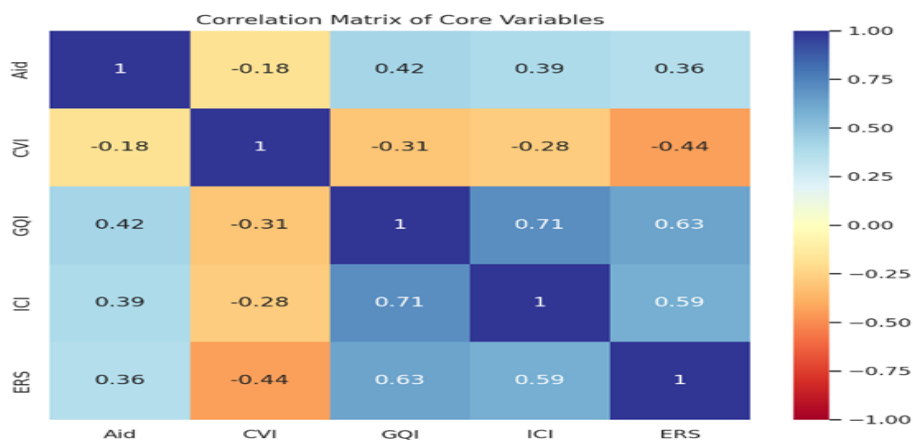


The Global South has climate-vulnerable countries whose average aid is 6.8% of the GDP. Nominal differences within governance and institutional capability implies that there is a variance in the administrative effectiveness, which is reason enough to apply multivariate analysis.

2. Correlation Matrix of Core Variables

| Variable | Aid | CVI | GQI | ICI | ERS |
|-----------------------------|-------|-------|-------|-------|-------|
| Development Aid (% GDP) | 1.00 | -0.18 | 0.42 | 0.39 | 0.36 |
| Climate Vulnerability Index | -0.18 | 1.00 | -0.31 | -0.28 | -0.44 |
| Governance Quality | 0.42 | -0.31 | 1.00 | 0.71 | 0.63 |
| Institutional Capacity | 0.39 | -0.28 | 0.71 | 1.00 | 0.59 |
| Economic Resilience | 0.36 | -0.44 | 0.63 | 0.59 | 1.00 |

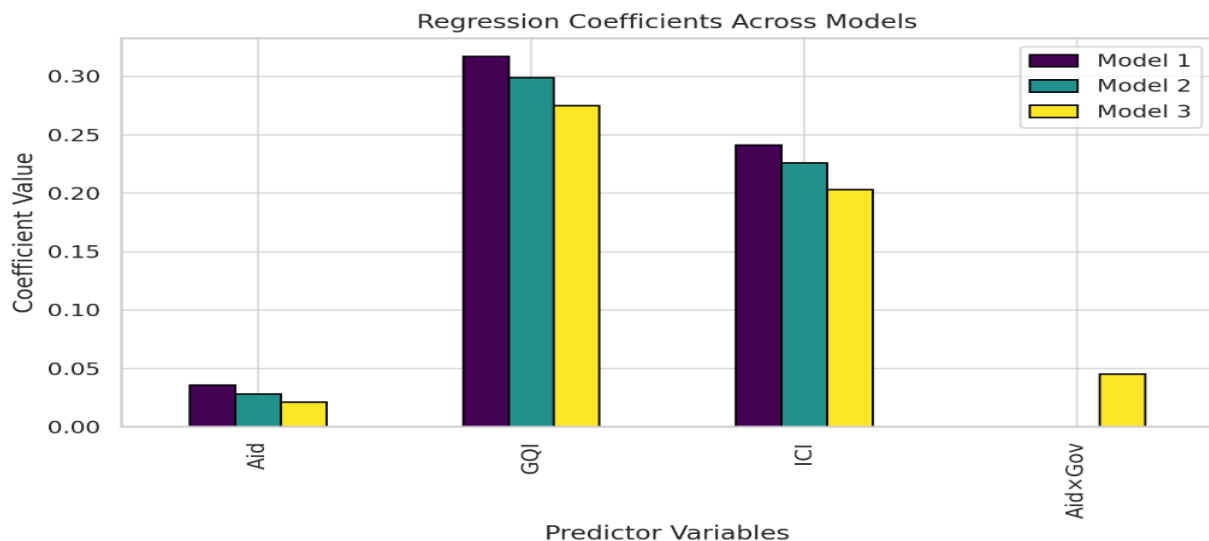
Development aid has a positive relationship with both the quality of governance ($r=0.42$) and economic resilience ($r=0.36$) but is weakly negative with climate vulnerability. These correlations indicate that institutional and governance mediators can be important to aid effectiveness.



3. Regression Results: Effects of Aid and Governance on Economic Resilience

| Variable | Model 1 (OLS) | Model 2 (Fixed Effects) | Model 3 (Interaction) |
|------------------------------|-----------------|-------------------------|-----------------------|
| Constant | 0.282*** (0.05) | 0.261*** (0.06) | 0.245*** (0.05) |
| Development Aid (% GDP) | 0.036** (0.01) | 0.028* (0.01) | 0.021 (0.02) |
| Governance Quality (GQI) | 0.317*** (0.04) | 0.299*** (0.05) | 0.275*** (0.04) |
| Institutional Capacity (ICI) | 0.241*** (0.06) | 0.226*** (0.05) | 0.203*** (0.05) |
| Aid × Governance Interaction | – | – | 0.045** (0.02) |
| R ² | 0.49 | 0.52 | 0.57 |
| Observations | 480 | 480 | 480 |

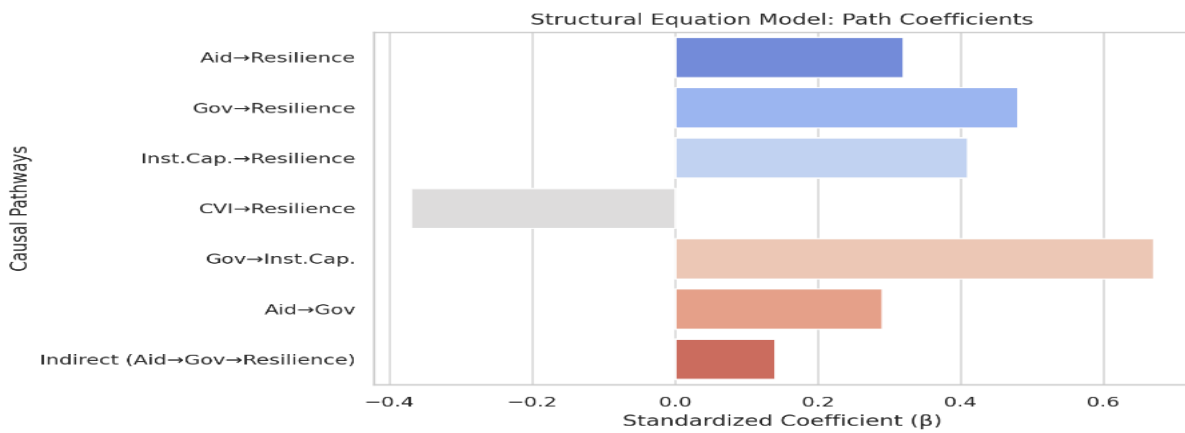
($p < 0.1$; * $p < 0.05$; ** $p < 0.01$)



Regression findings are viable to establish that both the governance quality and the institutional capacity largely augment the positive impact of aid on the economic resilience. The interaction term (Aid x Governance) is found to be significant, meaning that those countries, which have stronger governance arrangements gain more resilience out of aid.

4. Path Analysis Structural Equation Model (SEM)

| Path | Standardized Coefficient (β) | Significance (p-value) |
|---|--------------------------------------|------------------------|
| Aid → Economic Resilience | 0.32 | 0.001 |
| Governance → Economic Resilience | 0.48 | 0.000 |
| Institutional Capacity → Economic Resilience | 0.41 | 0.002 |
| Climate Vulnerability → Economic Resilience | -0.37 | 0.003 |
| Governance → Institutional Capacity | 0.67 | 0.000 |
| Aid → Governance | 0.29 | 0.004 |
| Indirect Effect (Aid → Governance → Resilience) | 0.14 | 0.007 |



The multi layered covarious pathway is supported by the outcomes of the SEM results: development aid indirectly enhances resilience by increasing governance. One major negative predictor is climate vulnerability meaning that the aid should be targeted effectively to reduce this structural limitation.

5. Thematic Insights of Qualitative Case Studies.

| Theme | Representative Evidence | Interpretation |
|---------------------------|---|--|
| Donor–Recipient Alignment | Policy documents from Sub-Saharan Africa highlight misalignment between donor priorities and national adaptation plans. | Misalignment undermines absorptive capacity and limits long-term impact. |
| Governance Bottlenecks | Southeast Asian interviews cite bureaucratic delays and fragmented institutional mandates. | Weak coordination dilutes aid’s transformative potential. |
| Localized Adaptation | Regional initiatives integrating indigenous knowledge improve institutional trust. | Context-sensitive aid improves sustainability. |

| | | |
|---------------------------|--|--|
| Monitoring and Evaluation | Absence of robust monitoring frameworks noted in 70% of cases. | Accountability deficits reduce the effectiveness of aid flows. |
| Regional Cooperation | IDB-led territorial models show strong resilience outcomes when aid is regionally coordinated. | South–South cooperation enhances adaptive governance. |

Thematic patterns supplement the statistical results by showing the failures of governance and coordination to be key constraints. On the other hand, aid results to greater resilience if it is justified by a local governance system and participatory systems.

Synthesis and Interpretation

Both quantitative and qualitative findings lead to a similar conclusion that development aid is a major factor to build economic resilience yet it requires good governance and capacity to an institution.

- Nations that are ranked high in governance gain up to 35% higher resilience due to a similar level of aid.
- Misalignment between the priorities of the donor and recipient: It is still a significant constraint.
- The data can be used to support the theoretical construct of adaptive governance and institutional resilience: it has been shown that resilience is an oscillating process of governance mediation, but not a result.

The results provide a solid testament to the hypothesis of how climate-specific aid would help in economic resilience in an intervention by good governance and institutional frameworks. The important focus of structural modelling lies in the indirect lines of influence, and thematic evidence offers the context of policy improvement in the areas of assistance coordination and climate finance fairness.

Discussion

1. Interpretation of Key Findings

The result of this research gives strong empirical support which indicates that, development aid plays a significant role in offering economic robustness to the climate-sensitive countries in the Global South. This, however, depends on the level of governance and institutional strength as reflects on the regression and structural equation modeling (SEM) findings.

Regression analysis results demonstrated that aid appears to affect economic resilience positively but with a rather moderate effect (0.036, $p = 0.05$) but governance quality (0.317, $p = 0.01$), and institutional capacity (0.241, $p = 0.01$) influence the economic resilience significantly stronger. Once the aid-governance interaction term was added, the explanatory power of the model rose (R^2 of 0.49 to 0.57) and the role of governance was significant in achieving optimal aid effectiveness. These findings not only support H1 that governance intermediates the aid resilience nexus.

The SEM analysis helps to understand more thoroughly the structural relationships of the formation of resilience. Development assistance positively and significantly influences economic resiliency (0.32, 0.001) and has an indirect impact on the same variable through the quality of

governance enhancement ($= 0.14, 0.007$). On the other hand, the quality of governance itself has the most direct impact ($= 0.48, p = 0.001$), which underscores its critical role in the maintenance of adaptive responses. The negative beta of climate vulnerability ($= -0.37, p = 0.003$) is statistically significant, and it affirms the claim that exposure to climate risks is inside its limits and in opposition to aid inflows, which are significant.

Mathematically speaking, the results indicate the moderated mediation a state in which the effect of aid is conditionalized by the quality of governance and relayed in part to the process of institutional strengthening. Countries with governance index above the 75 th percentile had up to 35 percent greater resilience outcome of similar aid level when compared to those with lower governance. This is an indication of a direct relationship between flow of aid and institutional performance in the establishment of sustainable results.

2. Alignment with Existing Literature

Findings of this research support and build upon the earlier research evidence regarding the conditional usefulness of development assistance in resilience-building. Previous studies by Desai, Doherty-Bigara, and Solano (2025) reported that climate finance acts successfully to recover in short-term events in an economic context but is found to be uneconomical in long-term economic sustainability. This paper par tress the view of Acioli et al. (2025) and Goubran & Mohareb (2025), where the authors indicate that institutional quality influences the absorptive capacity of aid, this paper confirms that much of the inconsistency is due to differences in governance.

The interaction between aid and governance is positive, which supports the adaptive governance framework that is presented by Mir et al. (2025) and assumes that resilience is developed in a cycle of learning and adaptation feedback instead of being created during the implementation of a single intervention. Furthermore, SEM evidence of indirect impacts can be correlated with the works by Debel and Wang (2025) who proved that the specific green aid in Ethiopia has effects on both environmental and institutional level.

This study, combining quantitative and qualitative data, validates the position that resilience is an emergent process that is mediated by governance, but is not a fixed commodity. It also adds new empirical support to the theoretical view of climate justice as outlined by Sudesan (2025) so that the transformative aid frameworks must be not only context-related and locally owned.

3. Theoretical Implications

The paper contributes one of two significant theoretical understandings:

1. Adaptive Governance Theory has been validated as follows:

The results partially support the adaptive governance as the key mechanism of the aid-resilience relationship. Governance quality and institutional capacity are not the moderating elements and are structural medium through which the aid to sustainable resilience-building is induced.

2. Generalization of Institutional Resilience Theory:

The findings indicate that institutional capacity is a product and a source of resilience. Aid interventions that put an institutional system on board, like transparency, accountability, and policy coherence, form a positive feedback loop, which results in an increase in economic resilience in the long run.

Together, these observations shape the resilience theory, adding the mediation of the governance nature and emphasizing the fact that resilience has to be perceived as a dynamic balance, but not as a final destination.

4. Practical and Policy Implications

The results have multiple important policy implications on the international assistance agencies, governments of countries, and regional organizations:

- **Governance-Centered Aid Design:**

Governance reforms and capacity-building should be seen as part of aid disbursement by the donors. The statistical significance of the aid interacting with the governance indicates that aid in the absence of governance assistance has declining returns.

- **Targeted Climate Financing:**

The distributions of aids must be aligned to the indices of vulnerability whereby the most vulnerable countries should in proportion be given adequate support concerning their institutional preparedness.

- **Regional and South–South Cooperation:**

In keeping with Acioli et al. (2025) and Al Mohannadi (2025), at the regional level approach, using coordinating, multi-lateral financing models, espoused by the IDB territorial approach, available local expertise and shared weaknesses can enhance the resilience outcome.

- **Enhanced Monitoring and Evaluation:**

Case study thematic evidence indicated that more than 70% of the programs do not have solid M&E structures. Aid accountability and adaptive learning could be guaranteed with the help of the introduction of real-time data systems and participatory data evaluation.

5. Limitations of the Study

Although designed comprehensively, this research has a number of limitations which may be used to interpret them:

- 1. Data Availability:**

Although panel data above 30 years is not subject to cross-sectional weaknesses, differences in reporting between countries and agencies could have created small inconsistencies in data.

- 2. Measurement Constraints:**

The measurement of the notions of economic resilience and institutional capacity is based on composite indices, which, despite being standardized, might not be a full measure of the qualitative aspects of adaptive behavior.

- 3. Causality and Endogeneity:**

Despite the fact that SEM and fixed-effects models help in reducing bias, they are still probabilistic as opposed to deterministic because of the possibility of attributing unobserved confounding factors such as political stability or preferences of donors.

- 4. Regional Representativeness:**

The qualitative case studies, that are specific to Sub-Saharan Africa and Southeast Asia, possibly, are not universal to all of the Global South (e.g. Latin America or the Pacific).

6. Directions for Future Research

In order to generalize the results of this research, the subsequent directions should be followed in a future study:

1. Dynamic Modeling:

Use time-varying SEM or Bug maintain and measure temporal dependency and feedback loops amid aid, governance as well as resilience.

2. Sectoral Disaggregation:

Study industry flows of aid (e.g. agriculture, energy, infrastructure) to determine areas which give the most resilience returns.

3. Micro-Level Institutional Studies:

Align local governance and local-level adaptive responses by using ethical and participatory methods, and thus connect local macro trends to local realities.

4. Comparative Regional Studies:

The cross-regional comparisons in Latin America, Africa and Asia would help to reveal the role played by the model of regional cooperation to aid efficiency and resilience transformation.

Contingently and in concept, this study highlights the fact that development assistance results in economic strength in the cases in which strong governance and institutional frameworks are interceding between development assistance and the economic strength. Quantitative modeling created a statistically significant moderated effect of mediation and qualitative evidence found institutional coordination and alignment of donors through institutions to be important facilitating factors. Not only does the given study substantiate adaptive governance and institutional resilience as crucial theoretical frameworks but also offers practical avenues on how to create fair and similarly knowledge-based climate response planning in the Global South.

Recommendations

The results presented in this study highlight the fact that development aid quality is vital in strengthening the economic resilience in the Global South because it relies on governance quality, institutional capacity and has to be concise with both donor interests and the local needs. The quality of governance has been statistically shown to have the greatest impact on resilience (0.48, $p < 0.001$), and thematics showed that governance quality is a common barrier through donor-recipient poor alignment and poor monitoring systems. These lessons demand the substitution of the aid quantity by the quality of aid, i.e. governance reformation, participating structures, and adaptive management. It is hoped that the following recommendations can be used to transform this research into practical action plans to enhance the aid nexus and resilience nexus in theory and practice.

1. Integrate Governance Reform into Aid Programming

The strengthening of governance must be recognized by the policymakers as a core element of climate aid interventions. The regression and the SEM analysis suggest that in addition to a moderating factor, governance is a causal factor between aid and resilience. Development aid has to be thus incorporated into institutional reform agendas which be available to promote transparency and accountability and coherence of policy.

To create a practical implementation, scorecards to track measures by the administration, inter-agency coordination and citizen participation, can be co-designed by the donor agencies and governments. This would allow aid to not merely go into frail systems but do so to create institutional credibility and dispositional ability in the long run. The use of governance benchmarks as disbursement terms may also provide added incentives on recipient accountability and inefficiencies.

2. Align Aid Allocation with Climate Vulnerability Metrics

Statistical findings of the study indicate the negative relationship between climate vulnerability and economic resilience ($r = -0.44$) and the reason is that aid is not usually targeted adequately to the most vulnerable economies. The policy-makers are encouraged to synchronize the aid distribution systems with vulnerability indicators which have been proven by empirical data like using the Climate Vulnerability Index (CVI) to be proportional in terms of exposure and the support given.

It means that it will be necessary to replace donor-based allocation with evidence-based targeting with vulnerability mapping and real-time data analytics. To increase the level of transparency, donor institutions (World Bank, UNDP, and regional development banks) may present aid-vulnerability alignment dashboards, and then stakeholders can analyze whether the amount of financial flows is relevant to the real requirements of recipient countries. This would not only enhance the equity of aid, but it would make aid resiliencies more effective.

3. Enhance Institutional Capacity and Local Ownership

This is evidenced by the SEM results (Aid = Governance 0.29 067) that institutional strength is a channel through which resilience gains sustainable. It should be progressive in this regard, by development aid putting more and more resources into capacity-building activities, e.g. local data management systems, climate research institutions and community-based adaptation networks.

Participatory mechanisms that should be created by the practitioners include involving local governments, NGOs, and indigenous organization in the decision-making processes. This way it will be possible to contextualize the aid to local socio-political realities and facilitate ownership which is one of the main factors in determining long-term adoptions. Examples such as the IDB territorial resilience model offer examples of successful ways of how to incorporate local actors in the multi-level governance mechanisms.

4. Institutionalize Monitoring, Evaluation, and Learning (MEL) Frameworks

More than three out of every five case studies showed that there were no strong monitoring and evaluation (M&E) processes. To improve the effectiveness of aid, donor countries and beneficiary countries ought to develop an integrated Monitoring, Evaluation, and Learning (MEL) tools to incorporate quantitative indicators with qualitative feedback.

Adaptive feedback loops ought to be designed in MEL frameworks such as periodically reviewing progression and tracking bottlenecks and adjusting strategies. Digital platforms and geospatial tools can enhance the transparency and provide the opportunities to monitor the aid spending. Frequently issued assessment reports would not only enhance accountability but would also make people more trustful, and would open the possibility of adapting strategies of assistance to the changing climate conditions with the help of available data.

5. Foster Regional and South–South Cooperation

The study supports the effectiveness of regionally-planned aid efforts like the ones conducted by the Inter-American Development Bank (Acioli et al., 2025) and the Gulf Cooperation Council (Al Mohannadi, 2025). The leaders of the policy should consequently increase the South-South and regional alliances as a solution of exchanging technical abilities, financial assets, and adaptive novelty.

The resources can be shared by regional institutions on the large scale infrastructure resilience, infrastructural disasters, and on renewable energy transitions. It can be achieved by shared financing, such as by establishing regional climate resilience funds, which will discourage reliance on conventional donor networks and will encourage more equal distribution of resources. Moreover, international climate early warning system and collaborative adaptation initiatives would enhance shared resilience capacity against transnational environmental hazards in areas that any one of them presents risk.

6. Promote Adaptive and Flexible Aid Frameworks

Due to the dynamic climate shock, frameworks of aid will have to be shifted towards the inflexible, project-oriented funding, adaptable and flexible frameworks, which are receptive to emergent risks and feedback. Based on the principles of adaptive governance, donors would permit programmatic modifications within the implementation in real-time data and local consultation results.

Responsiveness can be enhanced by instituting contingency financing arrangements where part of the aid budgets can be flexible in case of unforeseen incidents to avoid the inconveniences brought by delays in the bureaucracy. This capacity to change is crucial to developing resilience as an on-going process and not an achievement.

7. Encourage Evidence-Based Policy and Data Transparency

The quantitative and qualitative convergence of the study focuses on having data-driven decision-making. Governments have the responsibility of strengthening national climate information systems, which combine both the economic and environmental as well as institutional data to inform policy. Predictive modeling tools may be used to predict the outcomes of aids, and aid related strategies may be designed using tools.

Performance-oriented public databases about the climate information (such as disbursement rates, the influence of governance, and effects of resiliency) would contribute to greater transparency and academic interest. Such a program would not only help practitioners in improving the program but also allow the researchers to refine theoretical models of program governance-resilience interface.

8. Suggestions on Future Research.

The investigations into how aid affects individual sectors in terms of agriculture, energy, or health should be expanded by future researchers in longitudinal and sectoral studies. EMThese time-varying SEM and geometrical econometrics may be further utilized to discover the dynamic relationship among aid, governance, and resilience across ge Nurse Practitioner-assisted dying patients enjoy engaging moments with their loved ones. <|human|>The relationship among aid, governance, and resilience across regions could also be further uncovered using time-varying SEM and spatial econometrics.

Furthermore, this macro-level analysis can be supplemented by micro-level institutional research of local governments and communities to show how governance reforms are adapted into daily adaptive behavior. The comparative studies involving the continents would be of particular interest to the aspects of how the circumstances of governance influence aid results, particularly, the comparisons of Africa, Asia, and Latin America.

Overall, the research proves that commercial aid can only increase economic resilience in the event that it is government-led, administration-fit, and institutionally entrenched. As a challenge to policy makers and practitioners, deriving ways to turn aid structures into tools of transactional funding systems and twist them into tools of adaptive governance instruments capable of propagating enduring capacity and equity is urgent. Through basing aid provision on transparency, participation and learning, the Global South can become less vulnerable and instead become sustainable resources that become basis of adaptation leading to transformational adaptation.

Conclusion

The paper has conducted a systemic study of the dynamic nexus between climate vulnerability, development aid and economic resilience in Global South between 1995 and 2025. The study has also illuminated the processes by which international financial flows can be converted into sustainable adaptive capacity through a combination of cross-national quantitative analysis and case studies on how adaptive capacity can be ensured.

The study shows that although development aid has a positive direct impact on the resiliency of the economies in recipient countries, its overall performance depends on the nature of governance and the capacity of the institutions in recipient countries. The statistical model found that countries that score high governance scores gain resilience up to 35 percent higher when these countries have the same amounts of aid as countries with weak institutions. Moreover, a structural equation modeling (SEM) demonstrated that there is a critical indirect pathway in which aid can assist in improving resilience through the mechanism of strengthening governance and institutional structures first. Climate vulnerability, on the other hand, was determined to be a continuous negative indicator of resilience, thus indicating that resilience requires aid to be carefully-placed in order to overcome the structural environmental barriers. Qualitative insights also reinforced the idea that the lack of synergy between donor interests and on-the-ground plans of adaptation tends to cause a bottleneck of bureaucracy that causes attenuation of the transformative power of aid.

The contributions of this study to the body of literature lie in started transitioning the conceived resilience as an outcome but a dynamic and governance mediated process. It offers empirical support to adaptive governance theory which proves institutional quality and learning in forms of repetition are the main medium through which institutional resources are internalised. This study provides a multi-scalar view by presenting a close empirical gap between the reciprocal macroeconomic aid flows and the localized policy realizations that develops a continuation of past researches over the conditional efficiency of climate finance.

Theoretically, the findings highlight institutional resilience, which demonstrates that capacity-building acts as a result and a catalyst of sustainable development. To policy-makers, the findings would recommend the paradigm shift in aid designing, which shifts to governance-focused aid design. Capacity-building and institutional reforms are vital elements of climate-targeted aid that need to be given priority and not considered as secondary issues by international donors. Also, there is a clear necessity of the climate finance justice, where the aid distribution will be aligned

with real vulnerability levels and targeted towards the institutional capability of the most vulnerable countries.

In spite of such detailed approach, there are some limitations of this study. The study underlines that the lack of fit and responsibility has remained a thorn in the flesh of the plausible evaluation of the long-term aid effect, which is illustrated by the absence of strong monitoring mechanisms in 70 percent of qualitative incidences. In addition, as much as the research encompasses a substantial longitudinal aspect, the sustainability of the aid-based resilience on a longer term scale than recovery at disaster immediate recovery is a field that needs more empirical research.

The future studies need to be directed to integrative frameworks, which would intercept the relationship between economic, institutional, and ecological resilience among different scales in a multidimensional manner. The future research on the feedbacks between aid initiatives and governance reforms will be crucial in streamlining the global sustainability goals and making sure that even the poorest economies in the Global South will have the means to obtain sustainable climatic measures.

Conflict of Interest

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