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Federal Government Actions Supporting the Reconstruction of Rio Grande do Sul, Brazil: An Analysis of Public Policies

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Abstract
The floods of May 2024 in Rio Grande do Sul resulted in severe impacts on infrastructure and public health, exposing vulnerabilities and challenges for economic recovery. This study explores the strategies implemented by the federal government, focusing on the allocation of resources for post-disaster recovery, particularly in the areas of housing and economic impacts. The research employed a mixed-methods approach, combining documentary analysis of official reports and scientific articles by experts. Economic and public health data were collected to assess the effects of the floods and the effectiveness of recovery measures. The results indicated the relative effectiveness of some policies, particularly those of medium and long-term scope, while highlighting the socioeconomic vulnerability of low-income populations and the challenges faced by key economic sectors in pursuing economic recovery.

Keywords: Economic Impacts. Urban Planning. Climate Change. Post-Disaster Recovery.

Ações do Governo Federal no apoio à reconstrução do Rio Grande do Sul/Brasil: uma análise das políticas públicas

Resumo
As enchentes de maio de 2024 no Rio Grande do Sul resultaram em impactos severos na infraestrutura e na saúde pública, expondo a vulnerabilidade e os desafios para recuperação econômica. Este estudo explora as estratégias implementadas pelo governo federal, com foco na alocação de recursos para recuperação pós-desastre, particularmente para as áreas de habitação e impactos econômicos. A pesquisa utilizou uma abordagem mista, combinando análise documental de relatórios oficiais e artigos científicos de especialistas. Dados econômicos e de saúde pública foram coletados para avaliar os efeitos das enchentes

e a eficácia das medidas de recuperação. Os resultados indicaram a efetividade relativa de algumas das políticas, principalmente aquelas de longo e médio prazo, enquanto evidenciam a vulnerabilidade socioeconômica das populações de baixa renda, e os desafios enfrentados por setores chaves da economia na busca pela recuperação econômica.

Palavras–chave: Políticas Públicas. Mudanças Climáticas. Planejamento de Crises.

Acciones del Gobierno Federal en el apoyo a la reconstrucción de Rio Grande do Sul/Brasil: Un análisis de las políticas públicas

Resumen
Las inundaciones de mayo de 2024 en Rio Grande do Sul causaron impactos severos en la infraestructura y en la salud pública. Este estudio explora las estrategias del gobierno federal para la recuperación post-desastre y la asignación de recursos para la reconstrucción, enfocándose en la vivienda y en los impactos económicos. La investigación utilizó un enfoque mixto, combinando análisis documental de informes oficiales y artículos científicos con entrevistas a especialistas y afectados. Se recolectaron datos económicos y de salud pública para evaluar los efectos de las inundaciones y la eficacia de las medidas de recuperación. Los resultados indican la efectividad relativa de algunas de las políticas, principalmente a mediano y largo plazo, y demostraron la vulnerabilidad de las poblaciones de bajos ingresos y el desafío de sectores clave de la economía en la recuperación económica.

Palabras clave: Impactos Económicos. Planificación Urbana. Cambio Climático. Recuperación Post-Desastre.

1 Introduction

Extreme weather events, intensified by global climate change, have become alarming in both frequency and intensity, directly impacting infrastructure, economies, and communities (IPCC, 2021). The floods of 2024 in Rio Grande do Sul marked one of the most devastating climatic events in the state's recent history. These floods not only caused physical destruction and substantial economic losses but also revealed the vulnerability of urban infrastructures and the urgent need for effective public policies for the reconstruction and resilience of the affected cities.

According to the government of Rio Grande do Sul (2024), data on the floods provided by the state's Civil Defense indicated a significant impact on 478 municipalities, resulting in nearly 390,000 displaced individuals and over 2.4 million people directly affected. Almost 420,000 houses in the state were directly impacted by floods, flash floods, and landslides, affecting about 7% of the population. The magnitude of the destruction caused by the floods demands a coordinated and effective response from governments at all levels, with the implementation of public policies aimed at the reconstruction and resilience of cities.

This reality necessitates that such events be analyzed as models for the formulation and enhancement of public policies in prevention, combat, and post-disaster assistance, considering that the intensity and frequency of extreme weather events have increased significantly, reflecting a pattern associated with global climate change.

The importance of studying public reconstruction policies after natural disasters is evident given the challenges faced by governments at all levels. Public

policy analysis thus allows for the identification of best practices and the proposal of necessary improvements to increase the effectiveness of governmental interventions (Silva, Mendes, & Dourado, 2023). In the context of the 2024 floods, it is crucial to understand how different government levels can act and cooperate to minimize the impacts on populations affected in future disasters.

The complexity of the presented scenarios demands an urgent immediate response, emphasizing that post-disaster reconstruction requires effective coordination among municipal, state, and federal levels. In this regard, studies like that of Proag and Proag (2014) indicate that a lack of coordination and integration among these levels can result in fragmented and less efficient efforts. Therefore, this study seeks to analyze the actions undertaken by different levels of government, aiming to identify not only best practices but also areas needing improvement to ensure a more efficient and integrated response in future events.

The present study aims to analyze the federal public policies implemented for the assistance and reconstruction of cities in Rio Grande do Sul after the 2024 floods, evaluating their effectiveness, challenges, and opportunities for building more resilient and sustainable communities.

To achieve this objective, a methodology was developed based on the collection and analysis of news articles, utilizing advanced text mining and clustering techniques. This method allows for grouping news into thematic topics, facilitating the identification of priority areas and the communication strategies adopted by the government.

In light of the complexity and urgency of the situation, this study contributes to the understanding of governmental policy dynamics in contexts of crisis and post-disaster reconstruction. It is expected to provide insights for the formulation of more effective and transparent public policies that can strengthen the resilience of affected communities and promote sustainable and inclusive recovery.

The literature highlights the relevance of governmental actions in crisis situations, as evidenced by authors like Mileti and Sorensen (1990), who discuss the importance of effective actions in natural disasters, and Reynolds and Seeger (2005), who address best practices in risk communication. These studies provide a theoretical basis for analyzing the strategies adopted by state and federal governments in Rio Grande do Sul, offering a broader context for the evaluation of reconstruction efforts.

2 Methodology

The present study utilizes a survey of official statements published on federal and state portals, with the aim of analyzing the reconstruction of the state of Rio Grande do Sul after the floods that occurred in 2024. The methodological procedures adopted are outlined below, which were carefully structured to ensure the reliability of the results obtained.

Initially, a systematic survey was conducted on the official portals of federal government agencies, such as the Ministry of Regional Development, the Ministry of Infrastructure, and the Ministry of Citizenship. The statements were collected in the time interval between April 2024, immediately after the floods, and July 2024, ensuring the contemporaneity and relevance of the information obtained. To identify

the pertinent statements, keywords related to reconstruction, floods, public policies, and Rio Grande do Sul were used.

Subsequently, the selected statements were subjected to a process of analysis and clustering, employing the k-means algorithm, according to the guidelines of Han, Kamber, and Pei (2011) and Aggarwal (2015). The clustering technique, as discussed by Wang et al. (2016), is used to group elements with similar characteristics, facilitating comparative analysis. In this context, the actions were grouped based on their similarities in each of the four dimensions of analysis. The clustering process began with the identification of key variables for each dimension, and then the actions were grouped based on these variables.

1. **Economic Impact**: A scale was adopted that considers the expected magnitude of the actions on the local and regional economy. This criterion was developed from a qualitative and quantitative analysis of the potential economic repercussions of each measure, following the methods described by Kim et al. (2018).
2. **Type of Financial Contribution**: The classification of the type of financial contribution involved identifying the sources and forms of financing, such as credit, subsidies, or tax exemptions. This dimension is fundamental for understanding the nature of the resources utilized and was systematized based on typologies established by Liu et al. (2017), who discuss resource allocation in crisis contexts.
3. **Implementation Complexity**: This was measured by considering the necessary infrastructure, the degree of interinstitutional coordination, and administrative complexity. This dimension followed the principles outlined by Zhou et al. (2019), who explore the operationalization of public policies in complex environments and the need for administrative efficiency.
4. **Temporal Effect of Actions**: This was evaluated in terms of short-, medium-, and long-term impact. This aspect of the analysis was guided by the works of Garcia et al. (2020), who emphasize the importance of considering different time horizons in the evaluation of post-disaster recovery policies.

For data analysis, patterns were identified and an evaluation was conducted on how different types of public policies cluster according to the analyzed characteristics. This methodological approach is fundamental for the assessment of public policies in emergency contexts, as it offers a structured perspective that facilitates evidence-based decision-making, as argued by Chen et al. (2021).

The choice of this methodology is justified by the need to understand how reconstruction actions are being communicated and implemented by the government. Analyzing news reports allows for the identification of adopted priorities and strategies, as well as perceived challenges. Despite its limitations, this approach permits a preliminary analysis of ongoing public policies and can serve as a foundation for more comprehensive future studies. This methodology is supported by a consistent body of literature that validates the use of text mining techniques and

cluster analysis for interpreting large volumes of textual data (Han, Kamber, & Pei, 2011; Aggarwal, 2015; Jurafsky & Martin, 2021).

The methodology applied in this analysis, although relevant, possesses some limitations intrinsic to the initial stage of implementing reconstruction actions, which precludes a comprehensive evaluation of their effectiveness and tangible results. In this process, the analysis was primarily based on news from governmental sources, which may introduce a positive bias in the results. Given these limitations, it becomes essential to establish continuous and rigorous monitoring of public policies for constant adjustments and improvements. It is hoped that critical analysis of the experiences will support the formulation of more consistent and effective public policies in the future.

3 Theoretical Framework

3.1 On the Action Plan for Tragedies

In a world increasingly susceptible to extreme climatic events and other catastrophes, the capacity for effective disaster response becomes fundamental for governments and public entities. In these scenarios, the adoption of enhanced policies for risk management and contingency, focusing on prevention, mitigation, and response to adverse events, is an essential commitment to protect lives, preserve social well-being, and ensure the recovery capacity of communities.

Various studies highlight the necessity of implementing measures before the disaster, emphasizing the use of forecasting tools to identify possible catastrophic events and continuously monitor risk conditions (Proag & Proag, 2014). According to Alexander (2002), effective early warning systems must be established to inform the population and authorities about potential threats, allowing for a rapid and coordinated response. Additionally, other essential aspects include implementing mitigation measures to reduce the vulnerability of infrastructures and at-risk populations, such as reinforcing buildings, creating refuge zones, and educating the population on how to react in emergency situations (Dauphiné, 2001).

During the event, crisis management must be efficient, maintaining clear and reliable communication channels to disseminate precise and updated information, including coordination with the media to avoid rumors and ensure that the population receives correct guidance (Covello, 1992). Optimizing response time, involving the rapid mobilization of emergency teams and the use of pre-planned evacuation routes, can minimize the disaster's impacts (UNESCO, 2006).

After the disaster, for assessment and reconstruction, detailed evaluations of the damages caused must be conducted to understand their extent and identify priority areas for intervention, considering physical, economic, and social aspects (Wright, 2013).

Effective disaster management requires an integrated and multidisciplinary approach that combines scientific forecasting, risk management, and the mobilization of community and governmental resources. By following a structured risk management process, public entities can not only mitigate the immediate

impacts of disasters but also strengthen the resilience of communities to face future adverse events (Proag & Proag, 2014).

3.2 On Government Actions

Municipalities, being the frontline in disaster management, play a crucial role in immediate response and initial recovery. Recent reports, such as that by Silva et al. (2024), highlight that many municipalities in Rio Grande do Sul implemented emergency plans and mobilized local resources to deal with the floods. However, the variability in response capacity among the different municipalities, considering the number of affected cities, underscores the need for state and federal policies that can provide adequate and uniform support.

The state sphere, in turn, has the responsibility to coordinate actions among municipalities and ensure the efficient allocation of resources. The government of Rio Grande do Sul developed various initiatives to support the affected municipalities, as described in the report by Machado et al. (2024). These initiatives range from providing financial resources to offering technical support for the reconstruction of damaged infrastructures. The effectiveness of these measures, however, varies according to the implementation capacity and collaboration between the municipalities and the state.

At the federal level, comprehensive public policies are essential to provide a support framework that transcends local and state capacities. The Union, through its various agencies, plays a fundamental role in mobilizing resources and defining national guidelines for disaster management. Studies like that of Souza and Almeida (2022) show that federal intervention can be decisive in ensuring a coordinated and effective response in situations of great magnitude, such as the floods of 2024.

Beyond the immediate response, long-term reconstruction requires a sustainable and resilient approach. According to Abreu et al. (2019), incorporating sustainability principles into reconstruction policies is vital to reduce the future vulnerability of affected communities. This study examines how governments at different levels have integrated these principles into their reconstruction policies and practices, evaluating the effectiveness of these approaches.

Public policies must also consider adequate and efficient funding for reconstruction. Gomes et al. (2020) highlight that the allocation of financial resources is one of the greatest challenges in post-disaster management, and transparency in the distribution of these resources is essential to avoid fraud and ensure that support reaches the most needy communities.

Urban resilience, which involves the capacity of cities to recover and adapt to future climatic events, is a central aspect of reconstruction policies. International case studies, such as that by Zhang et al. (2017) on recovery after the Wenchuan earthquake in China, present relevant lessons on effective resilient reconstruction strategies. The application of these lessons in the context of the 2024 floods will be explored to identify practices that can be adapted to local realities.

Finally, the integration of local communities in the reconstruction process is fundamental to ensure that public policies meet the real needs of the affected populations. According to Freitas and Lima (2023), community participation strengthens social resilience and promotes a sense of ownership over reconstruction

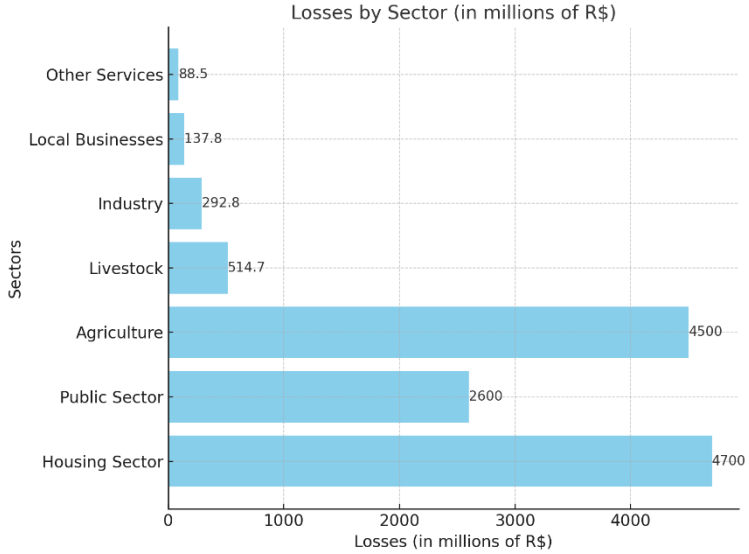
initiatives. This study will evaluate how community participation was incorporated into public policies after the 2024 floods and its implications for the effectiveness of these policies.

3.3 Financial losses caused by the floods

According to the Rio Grande do Sul Disaster Bulletin by the National Confederation of Municipalities (CNM, 2024), the State suffered an estimated direct financial loss of R$ 12.8 billion due to the intense rains that affected the State since April 24. Among the 478 affected municipalities, 418 had their state of abnormality recognized by the state government, with 323 in a state of emergency and 95 in a state of public calamity, with 462 registrations in the Integrated Disaster Information System (S2iD).

The restructuring of public institutions is still ongoing, impacting the total assessment of losses. By the end of July 2024, only 176 municipalities had detailed the damages and losses. The consolidated data from these municipalities are summarized in the table below.

Figure 01 – Economic Losses by Sector – Storms in Rio Grande do Sul



Source: Data from CNM (2024).

The housing sector was the most affected, with damages estimated at R$ 4.7 billion, resulting in 112,300 housing units damaged or destroyed. Losses in the public sector amount to R$ 2.6 billion, including material damage to public facilities (R$ 433.2 million), infrastructure works (R$ 1.8 billion), and transportation systems (R$ 152.8 million), among others. In the private sector, total losses reach R$ 5.5 billion, with agriculture suffering losses of R$ 4.5 billion and livestock experiencing damages of R$ 514.7 million.

The recovery of Rio Grande do Sul following these extreme climatic events faces significant challenges, exacerbated by the magnitude of the damage and the complexity of recovery operations. These difficulties are heightened by the need to restore critical infrastructure and essential services, which are vital for economic and social recovery.

First, economic recovery requires a massive investment in infrastructure, placing heavy demands on the state's financial and administrative resources. Alexander (2002) points out that post-disaster reconstruction is a long-term process that requires effective coordination between government spheres, along with partnerships with the private sector. The rehabilitation of structures such as bridges, roads, and urban drainage systems not only demands time but also strategic planning to ensure resilience against future climatic events.

Moreover, the prolonged disruption of economic activities, particularly in agriculture and livestock, directly impacts the state's Gross Domestic Product (GDP) and job and income generation. Skidmore and Toya (2002) argue that natural disasters can have prolonged adverse effects on the local economy, depending on the response capacity and pre-existing support infrastructure. Economic recovery, therefore, is not limited to physical restoration but also involves financial and technical support for producers and merchants to restore their activities.

Finally, the substantial financial resources required for recovery, within the context of the state's already limited fiscal capacity, impose additional pressure. The efficient mobilization of resources and the implementation of public policies are crucial to mitigate the socio-economic impacts of disasters, as highlighted by Stiglitz (2010). Moreover, the rigorous management of funds, whether sourced from local resources or external aid, is essential to ensure sustained recovery and the resilience of the local economy.

Thus, the recovery efforts in Rio Grande do Sul face multiple challenges that go beyond physical reconstruction, including economic revitalization and the enhancement of climate resilience. The economic, social, and infrastructural impacts could worsen if response and recovery measures are not implemented in an effective and coordinated manner.

4 Analysis of Federal Actions and Public Policies in Rio Grande do Sul

In response to the floods that occurred in Rio Grande do Sul, the Federal Government (Brazil, 2024) implemented a series of emergency measures and support for victims. These measures encompassed a variety of actions aimed at both providing direct assistance to the affected individuals and supporting state and municipal governments in the reconstruction of devastated areas. The actions selected for analysis in this study were those distinguished by their relevance and scope, characterized as macro-level intervention policies.

The analysis of these policies was based on previous studies on the allocation of resources for post-disaster reconstruction and the resulting economic and social impacts, as discussed by authors such as Zhang et al. (2015) and Smith et al. (2021). Zhang et al. (2015) explore the effectiveness of recovery policies in natural disasters in China, highlighting the importance of an integrated and sustainable approach to reconstruction. Similarly, Smith et al. (2021) analyze the role of public policies in mitigating the economic impacts in areas affected by natural disasters, emphasizing the need for policies that not only address the immediate emergency but also contribute to the long-term resilience of communities.

This perspective seeks to understand the role of government actions as a response to the floods in Rio Grande do Sul, which must not only mitigate the

immediate effects of the floods but also strengthen the recovery capacity of communities, promoting reconstruction that takes into account economic, social, and environmental aspects.

This integrated approach should ensure that recovery policies are not limited to palliative solutions but advance toward the construction of a more resilient environment, better prepared for future adverse events. Based on theoretical foundations and available empirical evidence, this study sought to analyze the effectiveness of the implemented government actions, as well as to propose improvements and recommendations for future interventions in disaster situations.

Table 1 below summarizes the main actions undertaken by the Federal Government in response to the floods that affected Rio Grande do Sul in 2024. The data were extracted from an official publication released on the government website and include a series of emergency and structural support measures.

Table 1: Summary of actions undertaken by the Federal Government in response to the floods that affected Rio Grande do Sul in 2024.

Category	Description of Action
PRONAF and PRONAMP Credit	Allocation of R$ 4 billion for subsidized credit to small and medium-sized producers and agricultural farming.
SOS-RS Transaction	Aimed at regularizing debts registered in the Union's active debt or FGTS for individuals and companies, with discounts of up to 70% on the total debt.
Debt Deferral	Suspension of debt payments for 12 months at public banks: BNDES, Caixa Econômica Federal, Banco do Brasil, and Finep.
PRONAMPE Credit	Allocation of R$ 4.5 billion to the Operations Guarantee Fund to grant up to R$ 30 billion in subsidized credit for micro and small businesses.
FGI-PEAC Credit	R$ 5 billion in credit for micro-enterprises, small, and medium-sized businesses.
Tax Postponement	3-month postponement of federal tax collection deadlines and national simplified tax system for 203,000 companies.
Credit to Public Institutions	Extraordinary credit of R$ 1.28 billion for Rio Grande do Sul to ensure the reconstruction of public institutions.
Wage Bonus	Early wage bonus payment schedule for 705,000 workers in Rio Grande do Sul, generating an impact of R$ 758 million.
Unemployment Insurance	Two additional unemployment insurance installments for 140,000 unemployed workers affected by the calamity, with an estimated impact of R$ 495 million.
Income Tax Refund	Priority payment of income tax refunds for 1.6 million taxpayers, with an estimated impact of R$ 1 billion.
Social Programs	Early payment of Bolsa Família and Gas Assistance on the first day of the schedule, benefiting 583,000 families, with an impact of R$ 380 million.
FGTS Calamity Withdrawal	FGTS withdrawal allowed for approximately 228,500 workers, amounting to R$ 6,220 per worker in 368 municipalities, with an estimated impact of R$ 715 million.
Emergency Health Actions	Strengthening of emergency health actions (12 field hospitals and 135 emergency kits, each kit sufficient for up to 1,500 people for 30 days) – R$ 282 million.
Housing Debt Suspension	Suspension of payment for housing loans under the Minha Casa, Minha Vida program for up to six months for 17,400 families.
Reconstruction Assistance	Government announces PIX payment of R$ 5,100 per family that lost belongings in the floods, granted to about 200,000 families, with a total value of approximately R$ 1.2 billion.
State Debt Deferral	Postponement of the state's debt payments to the Union for three years – R$ 11 billion.

Reconstruction Projects	Allocation of R$ 200 million to structured funds for loans to municipalities and the State of Rio Grande do Sul for reconstruction projects.
Interest Suspension	State government suspends interest payments for three years – R$ 12 billion.
Credit Analysis	Acceleration of credit analysis with Union guarantee for 14 affected municipalities, with an estimated total value of R$ 1.8 billion.
Infrastructure Reconstruction	Release of R$ 1.3 billion in funds for infrastructure reconstruction, benefiting 497 municipalities.
Financial Assistance	Extra installment of the Municipal Participation Fund (FPM) – R$ 190 million, directed to 47 municipalities.
Relief Actions	Civil Defense actions approved for 207 municipalities, with an estimated value of R$ 310 million.
Relief Actions	Funds directed for the sheltering of 120,000 people in 88 municipalities, with an estimated value of R$ 22 million.

Source: Adapted from Federal Government data (Brazil, 2024).

The selection of these actions was based on their relevance and potential impact, covering initiatives ranging from direct financial assistance to the population to the recovery of essential infrastructure. These actions were organized and analyzed according to their strategic importance in mitigating the socioeconomic impacts of the disaster, providing a comprehensive view of government responses in crisis situations.

The data analysis aims to understand the effectiveness of these interventions and their adequacy to the immediate and future needs of the affected population, considering the existing literature on public policies in disaster management and post-catastrophe recovery.

4.1 Qualitative Analysis of Actions

The table presented was developed with the objective of systematizing and classifying the actions taken by the Federal Government in response to the floods that affected the State of Rio Grande do Sul. By employing a detailed analysis methodology, the measures were organized into various categories, highlighting the diversity of interventions necessary to mitigate the disaster's impacts. The actions were grouped based on five main criteria: type of assistance, specific category, economic impact, type of financial contribution, implementation complexity, and the temporal effect of the actions.

Each action was categorized according to the type of assistance offered, ranging from support to agriculture and businesses to specific measures for public institutions and direct aid to individuals. The analysis of economic impact considered the potential financial repercussions of these actions, classifying them as low, medium, or high impact. The type of financial contribution was identified, highlighting whether the measure involved providing credit, tax relief, advance receivables, allocation of financial resources, or personnel and equipment.

Additionally, the complexity of implementation for each action was evaluated, considering the administrative and logistical challenges involved in executing the measures. Actions were classified into low, medium, or high complexity. Finally, the temporal effect of the actions was analyzed to understand the expected duration of benefits or interventions, categorizing them as short, medium, long-term, or immediate effect.

Table 02 provides a comprehensive systematization of the actions, facilitating the analysis of their effectiveness and allowing for the identification of priority areas for future interventions, ensuring an integrated and strategic approach to disaster management.

Table 02: Qualitative evaluation and systematization of actions taken by the Federal Government.

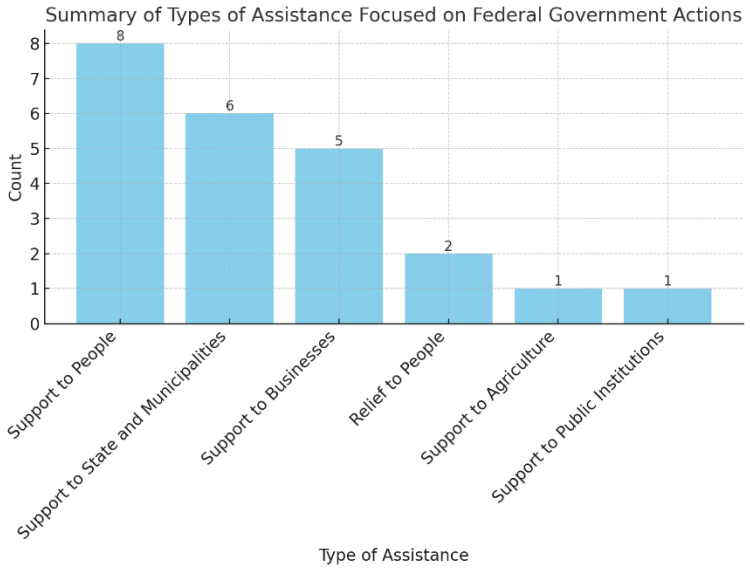
No.	Type of Assistance	Category	Economic Impact	Type of Financial Contribution	Implementation Complexity	Effect of Actions
1	SUPPORT TO AGRICULTURE	PRONAF and PRONAMP Credit	Medium	CREDIT PROVISION	High	Long Term
2	SUPPORT TO BUSINESSES	SOS-RS Transaction	Low	TAX RELIEF	Medium	Long Term
3	SUPPORT TO BUSINESSES	Debt Deferral	Low	TAX RELIEF	Low	Medium Term
4	SUPPORT TO BUSINESSES	PRONAMPE Credit	Low	CREDIT PROVISION	High	Long Term
5	SUPPORT TO BUSINESSES	FGI-PEAC Credit	Low	CREDIT PROVISION	High	Long Term
6	SUPPORT TO BUSINESSES	Tax Postponement	Low	TAX RELIEF	Low	Short Term
7	SUPPORT TO PUBLIC INSTITUTIONS	Credit to Public Institutions	Low	CREDIT PROVISION	Low	Long Term
8	SUPPORT TO PEOPLE	Wage Bonus	Low	ADVANCE RECEIVABLES	Low	Short Term
9	SUPPORT TO PEOPLE	Unemployment Insurance	High	ALLOCATION OF FINANCIAL RESOURCES	Low	Short Term
10	SUPPORT TO PEOPLE	Income Tax Refund	High	ADVANCE RECEIVABLES	Low	Short Term
11	SUPPORT TO PEOPLE	Social Programs	High	ADVANCE RECEIVABLES	Low	Short Term
12	SUPPORT TO PEOPLE	FGTS Calamity Withdrawal	High	ADVANCE RECEIVABLES	Medium	Short Term
13	SUPPORT TO PEOPLE	Emergency Actions	High	ALLOCATION OF PERSONNEL AND EQUIPMENT	High	Immediate
14	SUPPORT TO PEOPLE	Housing Debt Deferral	Medium	CREDIT PROVISION	Medium	Long Term
15	SUPPORT TO PEOPLE	Reconstruction Aid	Low	ALLOCATION OF FINANCIAL RESOURCES	High	Short Term
16	SUPPORT TO STATE AND MUNICIPALITIES	Debt Deferral	Low	TAX RELIEF	Medium	Long Term
17	SUPPORT TO STATE AND MUNICIPALITIES	Reconstruction Projects	High	ALLOCATION OF FINANCIAL RESOURCES	High	Long Term
18	SUPPORT TO STATE AND MUNICIPALITIES	Interest Suspension	Low	TAX RELIEF	Medium	Long Term
19	SUPPORT TO STATE AND MUNICIPALITIES	Credit Analysis	Low	CREDIT PROVISION	Medium	Short Term
20	SUPPORT TO STATE AND MUNICIPALITIES	Infrastructure Reconstruction	Low	ALLOCATION OF FINANCIAL RESOURCES	Medium	Medium Term

21	SUPPORT TO STATE AND MUNICIPALITIES	Financial Aid	High	ALLOCATION OF FINANCIAL RESOURCES	Medium	Long Term
22	RELIEF TO PEOPLE	Relief Actions	High	ALLOCATION OF PERSONNEL AND EQUIPMENT	High	Immediate
23	RELIEF TO PEOPLE	Relief Actions	High	ALLOCATION OF FINANCIAL RESOURCES	High	Immediate

Source: Adapted from Federal Government data (Brazil, 2024).

The table provides a detailed analysis of the main outcomes in four critical dimensions: Economic Impact, Type of Financial Contribution, Implementation Complexity, and Effect of Actions, as shown in Figure 02 below.

Figure 02 – Summary chart of types of assistance focused on Federal Government actions.



Source: Adapted from Federal Government data (Brazil, 2024).

As shown in Figure 02, we can observe a prioritization of the types of assistance provided, with a significant emphasis on direct support to individuals. Detailed information about each type of assistance will be discussed below, providing an analysis of resource allocation and the rationale behind the varying levels of support.

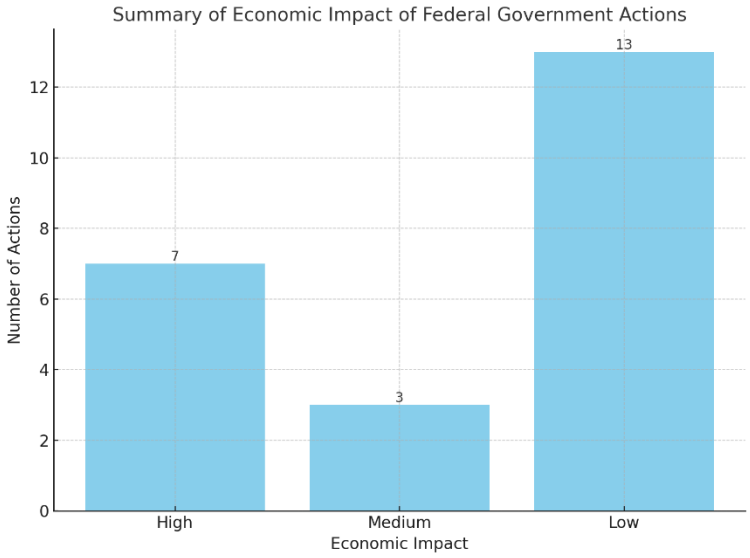
Support policies aimed at individuals and state and municipal governments are crucial in disaster situations, as they address immediate needs and strengthen institutional response capacity. Direct assistance to individuals ensures the rapid provision of essential resources such as food, shelter, and medical care, alleviating suffering and promoting individual recovery. Simultaneously, support to local and state governments enhances crisis management by facilitating infrastructure reconstruction, the restoration of public services, and strengthening institutional resilience.

4.1.1 Economic Impact

The Federal Government implemented a series of measures in response to the floods that affected Rio Grande do Sul. To assess the economic impact of these measures, the capacity of each action to influence the local and regional economy was considered. The actions were classified into three levels: high, medium, and low economic impact.

The actions were categorized according to the expected economic impact, ranging from low to high. Measures with high economic impact, such as unemployment insurance programs and income tax refunds, were designed to provide significant and immediate financial relief to affected families, helping to stabilize consumption and the local economy. On the other hand, actions with low economic impact, such as tax deferral and debt rescheduling, were viewed as minor interventions with more limited effects in terms of overall economic reach, as demonstrated in Figure 03 below.

Figure 03 – Summary chart of the economic impacts of the Federal Government's actions.



Source: Adapted from Federal Government data (Brazil, 2024).

The actions with high economic impact were those that had the potential to bring about significant changes in the income and economic well-being of affected individuals and communities. For example, unemployment insurance and the early refund of income tax were crucial in injecting liquidity into the local economy, providing direct financial support to individuals, which helped sustain consumption and reduce the financial vulnerability of families. These measures also contributed to stabilizing the labor market and prevented a more severe deterioration of socioeconomic conditions in the region. Additionally, social programs, such as the early disbursement of benefits, acted as safety nets, offering essential resources for the basic sustenance of vulnerable populations.

Actions classified as having a medium economic impact included initiatives such as agricultural credit through PRONAF and PRONAMP, which had a significant, though more localized, effect, particularly in maintaining agricultural production and

supporting small rural producers. These credits helped ensure the continuity of agricultural activities, preventing a supply crisis and promoting the gradual recovery of production. Debt rescheduling for housing was also a significant measure, providing relief to families in financial difficulty, but with more specific and less comprehensive effects compared to high-impact actions.

Regarding the actions with low economic impact, they were characterized by their limited effect in terms of scope and depth. These included measures such as tax deferral, tax relief in some areas, and corporate debt rescheduling actions. While these measures provided some fiscal and financial relief, their reach was restricted, affecting a specific segment of the population or businesses, without generating a large injection of resources or significant changes in aggregate demand. Credit actions aimed at businesses, such as PRONAMPE and FGI-PEAC credit, also fall into this category when compared to higher-impact actions, as they target a specific group of beneficiaries and depend on the absorption capacity of those sectors.

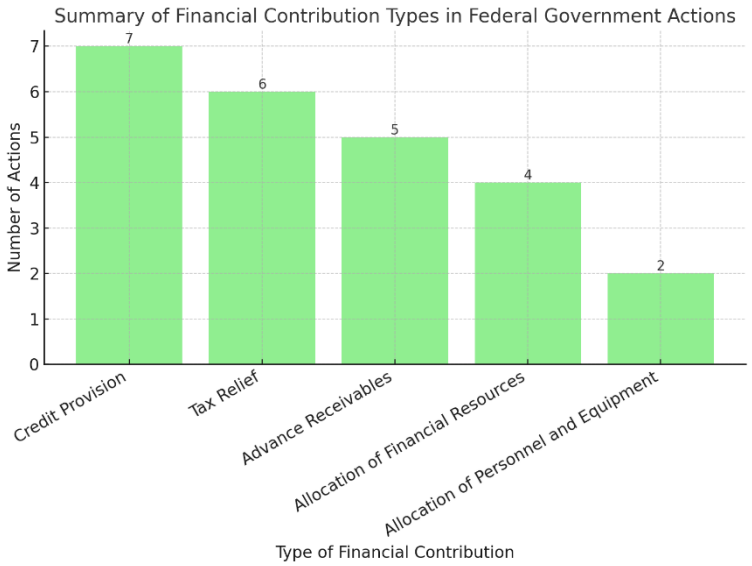
The economic impact of the actions was largely influenced by the level of financial intervention and the breadth of the measures. Actions with high economic impact tend to involve direct transfers of financial resources or significant benefits to a large portion of the population, generating considerable multiplier effects in the economy. In contrast, medium- or low-impact actions are generally more specific and less expansive, focusing on particular sectors or groups, with a more modest contribution to the overall economy.

These classifications provide an understanding of the effectiveness of government interventions in terms of post-disaster economic stabilization and recovery, offering lessons that can contribute to the planning of future crisis mitigation and response policies.

4.1.2 Type of Financial Contribution

The manner in which financial support is provided is one of the key criteria for analyzing the public policies implemented in response to the floods in Rio Grande do Sul. This criterion refers to the different forms of financing and financial aid provided by the Federal Government to mitigate the disaster's impacts. The classification of actions according to this criterion covers several modalities, each with specific characteristics and implications for both the beneficiaries and public administration.

Figure 04 – Summary chart of the types of financial contributions in the Federal Government's actions.



Source: Adapted from Federal Government data (Brazil, 2024).

The strategy of credit provision was the most utilized, highlighted by programs such as PRONAF and PRONAMP, which offered R$ 4 billion in credit for farmers, and PRONAMPE, which made R$ 4.5 billion available for small and medium-sized businesses. Additionally, the FGI-PEAC credit was directed toward individual micro-entrepreneurs and small businesses. These initiatives aimed to maintain liquidity and sustain economic activities in crucial sectors. However, the true effectiveness of these credits depends on the beneficiaries' ability to absorb the resources, especially in a context where infrastructure may be compromised, limiting the execution of recovery projects.

The tax relief measures implemented by the Federal Government, such as the SOS-RS transaction and debt deferral, were essential in providing immediate financial relief to companies and individuals affected by the floods. The temporary suspension of fiscal obligations, such as tax deferral and interest suspension, allowed resources originally earmarked for these obligations to be redirected toward asset recovery and the restoration of essential operations. These policies were particularly useful for companies facing liquidity difficulties, enabling them to continue their activities during a time of extreme need.

However, these tax relief measures also presented significant challenges, with the inherent risk that they disproportionately benefit more capitalized companies that may have a greater ability to take advantage of fiscal benefits, to the detriment of smaller businesses that, even with relief, still face considerable difficulties.

Receivables anticipation measures implemented by the Federal Government, including the early return of income tax refunds, social programs, and the FGTS emergency withdrawal, were strategies designed to provide immediate liquidity to affected families. The income tax refund, for example, allowed many taxpayers to quickly receive financial reimbursements, providing necessary relief in times of crisis. Similarly, the advance of social program benefits ensured that the most vulnerable families could access financial resources to meet basic needs such as food and housing. The FGTS emergency withdrawal, which allowed workers to withdraw part

of their funds, was an essential measure to provide additional financial support, helping to cover emergency expenses and repairs needed due to the flood damage.

Although they provide immediate relief, these actions represent a temporal redistribution of resources, without a net increase in income, which could lead to future financial difficulties for those already living in vulnerable conditions. For instance, advancing income tax refunds and social program benefits may deplete the resources families would have available later, leading to a lack of financial support in the future. Another challenge is the equity in the distribution of these resources, as individuals outside the formal system or without access to benefits may be excluded from these assistance measures, exacerbating existing inequalities. Thus, while receivables anticipation actions were effective in the immediate crisis response, it is essential to consider follow-up strategies that ensure families' financial sustainability in the long term and address equity issues in access to resources.

Financial resource allocation actions, such as social programs, reconstruction projects, and direct financial aid, were fundamental elements in the Federal Government's response to the floods in Rio Grande do Sul. These initiatives, classified in the table as having a high economic impact, aimed to provide immediate and long-term support for the recovery of affected areas. The direct allocation of funds to social programs helped maintain a basic subsistence level for the most vulnerable populations, ensuring access to food, medicine, and other essential needs. Reconstruction projects, on the other hand, are essential for restoring critical infrastructure, including roads, bridges, and public facilities that are vital for the functioning of local society and economy. Direct financial aid for reconstruction and support for state and municipal governments enabled the execution of repair and mitigation projects, laying the groundwork for resilient recovery.

However, the implementation of these financial resource allocation policies is not without challenges and issues. Government bureaucracy and the lack of technical capacity in some municipalities can delay the implementation of reconstruction projects, resulting in critical delays that prolong the suffering of affected communities. Moreover, the need for the rapid mobilization of large sums of money increases the risk of corruption and misuse of resources, which could compromise the effectiveness of recovery measures. Another issue is the long-term financial sustainability of these interventions. While investment in infrastructure is necessary, there is a risk that dependence on federal funds could create unsustainable expectations of continued support, without a clear plan for transitioning to local or private financing sources.

Personnel and equipment allocation actions were an essential component of the Federal Government's emergency response to the floods in Rio Grande do Sul. These initiatives, classified in the table as having a high economic impact and immediate effect, included the mobilization of rescue teams, medical assistance, and relief efforts, as well as the distribution of equipment and logistical resources necessary to support emergency operations. A notable success of these policies was the quick response in critical situations, ensuring the safe evacuation of risk areas, the provision of emergency medical care, and the maintenance of public safety.

However, these personnel allocation policies encountered challenges related to effective interinstitutional coordination, which can be hindered by bureaucracies and communication failures between different levels of government and involved

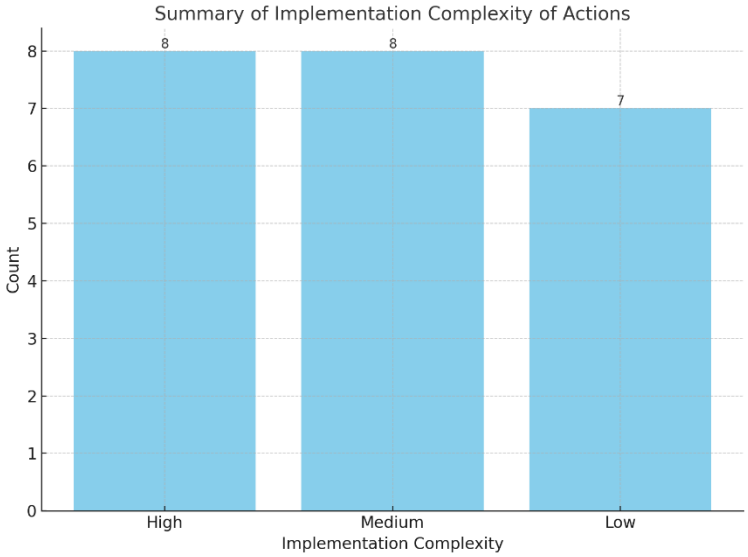
agencies. Thus, while personnel and equipment allocation actions are vital in an emergency response, continuous and improved planning is necessary to ensure fair and effective resource allocation, along with strategies to sustain these efforts over time.

In summary, the Federal Government's actions reflect a comprehensive approach, addressing different aspects of post-disaster recovery. However, to maximize the positive impact of these measures, it is essential to ensure efficient and coordinated implementation, as well as balance immediate relief with the need for fiscal sustainability and preparation for future disasters.

4.1.3 Implementation Complexity

High-complexity actions, such as credit through PRONAMPE and infrastructure reconstruction initiatives, require significant interinstitutional coordination, as well as complex technical and logistical resources. These actions involve more robust bureaucratic and administrative processes, making execution more challenging. In contrast, low-complexity measures, such as the anticipation of social benefits or tax refunds, are easier to implement due to their operational simplicity and lower need for coordination.

Figure 05 – Summary chart of the implementation complexity of Federal Government policies.



Source: Adapted from Federal Government data (Brazil, 2024).

A positive aspect of these policies was the mobilization of the necessary technical and administrative resources to implement complex programs, which are essential for long-term economic and structural recovery. The effective execution of these initiatives can strengthen critical infrastructure and support the recovery of local economies, in addition to improving resilience to future disasters.

However, the high complexity of some actions presents considerable challenges. The need for efficient interinstitutional coordination can be hindered by excessive bureaucracies, competency conflicts, and a lack of clarity in responsibilities, which can lead to delays in implementation and resource distribution.

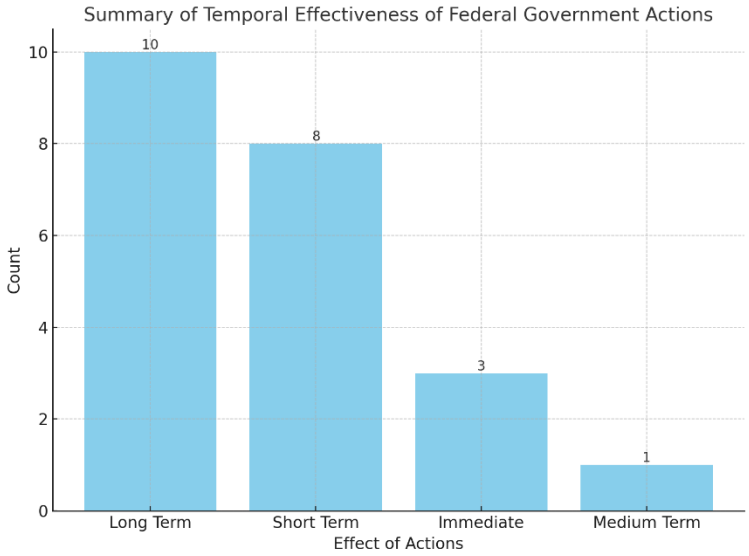
Additionally, high-complexity policies often require specialized technical capacities and significant resources, which can overwhelm local and regional administrations, especially in severely affected areas with limited infrastructure. Managing large reconstruction projects, for instance, may face challenges in obtaining materials, hiring qualified labor, and ensuring compliance with quality and safety standards.

In contrast, low-complexity actions, such as the anticipation of receivables, while simpler to implement, may not provide the necessary level of support to address the deep structural challenges caused by the disaster. The disparity in execution capacity may result in an unequal allocation of resources, where better-prepared areas receive more support, while more vulnerable regions with less administrative capacity are underserved. These challenges highlight the need for detailed planning and adaptive management to overcome implementation complexities, ensuring that all affected communities receive adequate and timely support.

4.1.4 Temporal Effect of Actions

The effect of the actions was analyzed based on the expected temporal horizon of their impacts, classified into immediate, short, medium, and long-term effects. Immediate actions, such as relief operations and the allocation of personnel and equipment, were critical to addressing urgent and emergency needs. Short-term actions, such as the anticipation of benefits and refunds, aimed to provide quick relief to victims. Medium-term measures, such as debt deferral and infrastructure reconstruction, were designed to stabilize economic and social conditions after the initial emergency. Finally, long-term actions, such as credit programs and reconstruction projects, were designed to sustain ongoing and resilient economic and social development.

Figura 06 – Summary chart of the temporal effectiveness of Federal Government policies.



Source: Adapted from Federal Government data (Brazil, 2024).

The actions implemented by the Federal Government in response to the floods in Rio Grande do Sul were planned to produce effects over different temporal horizons, categorized as immediate, short, medium, and long term. Immediate interventions, such as the strengthening of emergency health actions and Civil Defense operations, were effective in addressing urgent needs and saving lives, demonstrating the government's capacity for rapid resource and personnel mobilization.

The allocation of funds to provide shelter for 120,000 people and the establishment of field hospitals reflect a significant success in the emergency response, quickly addressing the health and safety needs of affected communities. These measures are essential for stabilizing the situation in the early stages of the crisis, but their impact is typically short-lived, requiring subsequent policies to sustain recovery efforts.

On the other hand, actions with short- to long-term effects, such as the anticipation of social benefits and credit programs, aimed to provide financial relief and continued structural support. The anticipation of wage bonuses, income tax refunds, and FGTS withdrawals helped inject liquidity into the local economy, benefiting millions of people.

These measures, however, present significant challenges, such as the risk of early depletion of personal financial resources, which may compromise the individuals' economic resilience in the medium term. Long-term policies, including financial allocations for infrastructure reconstruction and the suspension of state debts, were designed to ensure sustainable and resilient recovery.

Nevertheless, the effectiveness of these actions is often compromised by implementation challenges, such as bureaucratic complexity and the interinstitutional coordination required to manage large-scale projects. Additionally, the prolonged impact of such measures depends on efficient execution and continuous financing, which may be challenged by budget constraints and shifts in political priorities. Thus, while the effect of the actions was strategically staggered to address different phases of recovery, the long-term success depends on integrated management and the mitigation of administrative and financial obstacles.

5 Conclusions

The Federal Government's response to the 2024 floods in Rio Grande do Sul involved a series of initiatives ranging from immediate emergency actions to medium- and long-term strategies aimed at the economic and social recovery of the affected areas. These actions included direct financial support, debt restructuring, and infrastructure reconstruction projects, forming a comprehensive and coordinated approach to mitigate the disaster's impacts.

However, the effectiveness of these policies is intrinsically linked to efficient implementation and interinstitutional coordination, in a challenging context marked by bureaucratic and logistical obstacles. The analysis of the policies reveals that, although emergency measures were executed quickly, long-term actions, such as infrastructure reconstruction and credit provision, require detailed and adaptive management to ensure effective results. The vulnerabilities exposed in urban

infrastructure and the disaster response system underscore the need for continuous improvement in public policies.

One of the main challenges identified was the fragmented implementation of policies, which led to duplicated or inadequately aligned efforts, compromising the effectiveness of the actions and the proper allocation of available resources. Furthermore, bureaucratic complexity, especially in large infrastructure projects, combined with the need for approval by multiple agencies and a lack of clarity in administrative procedures, delayed the execution of crucial measures, prolonging the recovery period for affected communities.

The distribution of financial resources also presented challenges, including transparency and equity issues. Excessive bureaucracy and the absence of clear criteria resulted in an inadequate distribution of resources, leaving needy areas without essential support. The reliance on mechanisms such as FGTS and income tax refunds, which have limited reach, exacerbated these difficulties.

To overcome these obstacles, it is imperative to improve interinstitutional coordination and communication between different levels of government. Creating a unified command structure during crises can centralize decision-making and increase the efficiency of policy implementation. Additionally, clear communication with the public is necessary to avoid misinformation and ensure that communities understand how to access available resources.

Simplifying and debureaucratizing administrative processes during crises is equally necessary to expedite the release of resources, as well as the execution of projects. The creation of an emergency protocol can facilitate the rapid mobilization of resources.

Transparency in resource management and the active participation of affected communities are critical to the success of policies, with the inclusion of mechanisms for oversight of reconstruction projects increasing transparency and ensuring solutions tailored to local needs.

Finally, there must be a continuous commitment to improving crisis management systems, not only in the immediate response to emergencies but also in long-term planning for building resilient communities and mitigating risks. Strengthening governance and the technical capacity of local managers are important elements for the success of public policies in the face of natural disasters.

In summary, although the government's response was comprehensive, significant improvements are necessary. The approach must be integrated, coordinated, and transparent, focusing on long-term resilience and equity in access to resources. The lessons learned are essential for preparing the state and the country to face future extreme climate events, especially in light of global climate change, which intensifies the frequency and severity of these events.

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