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The 2024 Climate Tragedy in Rio Grande do Sul, Brazil. Notes on a foreseen catastrophe

A tragédia climática no Rio Grande do Sul em 2024. Anotações sobre uma catástrofe anunciada

La tragedia climática en Rio Grande do Sul , Brasil, en 2024. Notas sobre una catástrofe anunciada

La tragédie climatique au Rio Grande do Sul, Brésil, en 2024. Notes sur une catastrophe annoncée

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ABSTRACT

This brief account captures the experiences and observations recorded on-site by the authors during and after the climate disaster that struck the state of Rio Grande do Sul from late April through May 2024. This report aims to consolidate information on what is regarded as one of the most severe climate disasters in Brazil from the onset of the catastrophe to the end of October 2024. For this purpose, we gathered data from various official and unofficial sources, fellow researchers from several universities, online news outlets, social media, and personal testimonies collected during and after the catastrophic events.

KEYWORDS: floods; systemic and multidimensional disasters; climate catastrophe; Rio Grande do Sul; Brazil.

RESUMO

Este é um breve relato das circunstâncias vividas e observadas *in loco* pelos autores durante e após a tragédia climática ocorrida no estado do Rio Gran-

de do Sul entre o fim dos meses de abril e maio de 2024. Trata-se de uma tentativa de organizar informações entre o início da catástrofe até o fim do mês de outubro de 2024 sobre o que se considera um dos mais violentos desastres climáticos no Brasil. Para tanto, realizamos consultas a diversas fontes oficiais, não oficiais, colegas pesquisadores de diversas universidades, jornais online, redes sociais e depoimentos pessoais colhidos nos dias durante e após os eventos da catástrofe.
PALAVRAS-CHAVE: inundações; desastres sistêmicos e multidimensionais; catástrofe climática; Rio Grande do Sul; Brasil.

RESUMEN

Este es una breve descripción de las circunstancias vividas y observadas *en loco* por los autores durante y después de la tragedia climática que ocurrió en el estado de Río Grande do Sul, Brasil, entre finales de abril y mayo de 2024. Es un intento de organizar informaciones entre el comienzo de la catástrofe hasta finales de octubre de 2024 sobre lo que se considera uno de los desastres climáticos más violentos de Brasil. Con este fin, realizamos consultas a varias fuentes oficiales, no oficiales, compañeros investigadores de varias universidades, periódicos en línea, redes sociales y testimonios personales recopilados en los días durante y después de los eventos de la catástrofe.
PALABRAS CLAVE: inundaciones; desastres sistémicos y multidimensionales; catástrofe climática; Rio Grande do Sul; Brasil.

RÉSUMÉ

Ceci est un bref compte rendu des évènements vécus et observés sur place par les auteurs pendant et après la tragédie climatique qui s'est produite dans l'État de Rio Grande do Sul, au Brésil, entre la fin du moins d'avril et le mois de mai 2024. C'est un essai d'organisation d'informations collectés entre le début de la catastrophe et la fin du mois d'octobre 2024 sur ce qui est considéré comme une des catastrophes climatiques les plus graves de l'histoire du Brésil. À cette fin, nous avons consulté plusieurs sources officielles et non officielles, des collègues chercheurs de plusieurs universités, des journaux en ligne, des réseaux sociaux et des témoignages personnels recuellis à l'époque et après les événements.
MOTS-CLÉS : inondations ; désastres systémiques et multidimensionnels ; catastrophe climatique ; Rio Grande do Sul ; Brésil.

INTRODUCTION

The text[1] covers a brief history of the climate disasters in Rio Grande do Sul in 2023 and 2024; the regions most affected by floods[2]; landslides and "scars" on the landscape; rescue operations; impacts on transportation infrastructure; federal and state government support for reconstruction efforts; disaster capitalism and unfeasible proposals; testimonies from people directly or indirectly impacted by the floods; and, finally, brief reflections on the current climate crisis in the context of the October 2024 municipal elections—where much of the debate centered on flood maintenance and prevention responsibilities, and the contradictory re-election of Porto Alegre's mayor, Sebastião Melo.

AN ANNOUNCED CATASTROPHE: A BRIEF HISTORY OF CLIMATE DISASTERS IN RIO GRANDE DO SUL IN 2023 AND 2024

We could analyze whether the floods of 2023 and 2024 qualify as *natural* or *socio-environmental* disasters, but here, we adopt the view that they are *systemic and multidimensional disasters with numerous interconnected fronts*, impacting the environment, diverse forms of life, urban areas, agricultural regions and their economies, public institutions, civil organizations, and the general population, among others. Three events in 2023 foreshadowed the potential for further disasters, given climate change and Rio Grande do Sul's position between the natural influences of Antarctica and the Amazon. In June 2023, a cyclone struck Rio Grande do Sul, particularly affecting the Metropolitan Region of Porto Alegre (RMPA) and areas near the Serra Gaúcha (Serra Geral) and the North Coast, resulting in 16 fatalities. In September of that year, new floods led to an additional 54 deaths in the state, marking what was then considered the largest natural disaster in Rio Grande do Sul's history, particularly devastating the Taquari Valley. Two months later, another heavy rainfall event claimed five more lives. At least 28,000 people were forced to leave their homes beginning on November 17, with disruptions particularly concentrated in the Taquari Valley, Serra Gaúcha, and RMPA.

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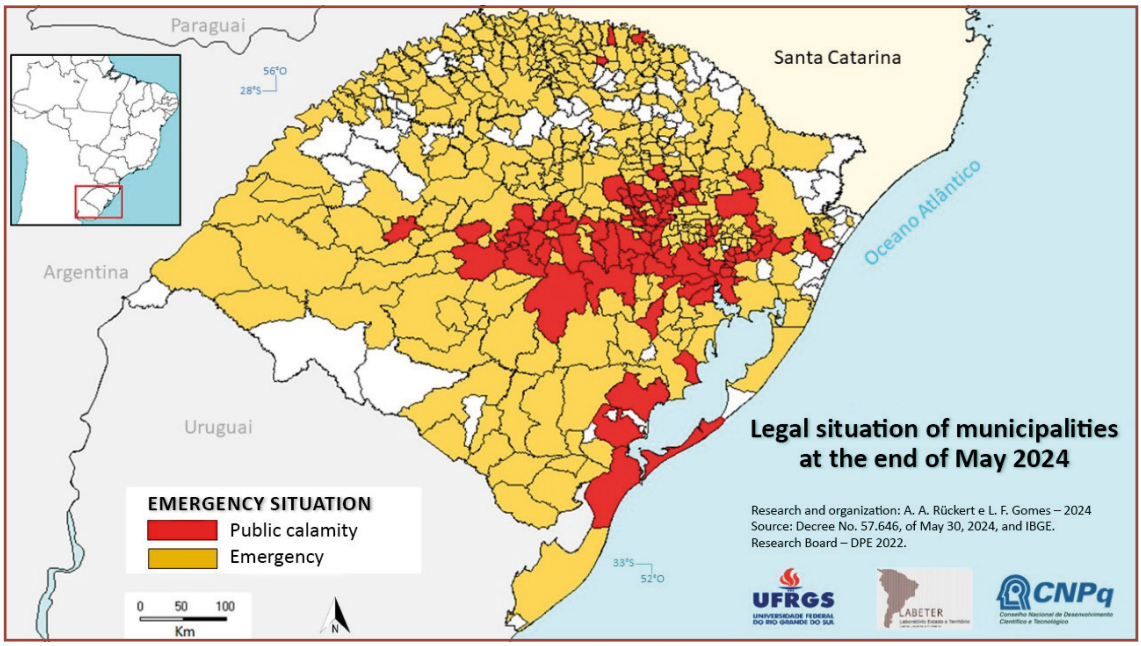
1 This account benefited from the discussions held during the 14th Biennial Colloquium on Territorial Transformations of the Montevideo Group Association of Universities at Unicamp, from July 24 to 26, 2024. Additionally, it was shaped by the invitation from Prof. Dr. Cláudio Zanotelli, editor of Revista Geografares at the Federal University of Espírito Santo, to organize this text.

2 The term "floods" is adopted here following the Brazilian Disaster Codification and Classification System, categorized as a natural hydrological phenomenon.

This, as one can see, was an announced catastrophe. According to Metsul, rainfall alone in Rio Grande do Sul between late April and May 2024 exceeded 1,000 mm in some areas, while the state's historical annual average varies from 1,299 to 1,800 mm depending on the region (Atlas, 2022). Francisco Aquino, a geographer at UFRGS – Federal University of Rio Grande do Sul, explained that climate change, an atmospheric block over southern Brazil, the end of El Niño, warmer ocean temperatures, and a major heat wave were responsible for this excessive rainfall (IHU, Unisinos, 2024a). The disaster struck between April 28 and the end of May 2024, affecting nearly the entire state—222,167 km² out of its 281,707 km² total area. This affected area is 2.4 times larger than countries like Portugal or 7.2 times the size of Belgium, impacting at least 418 of its 497 municipalities, most of which are key agro-industrial producers.

THE REGIONS MOST AFFECTED BY THE FLOODS

Figure 1 – Municipalities in the State of Rio Grande do Sul declared in a State of Public Calamity and Emergency as of May 31, 2024



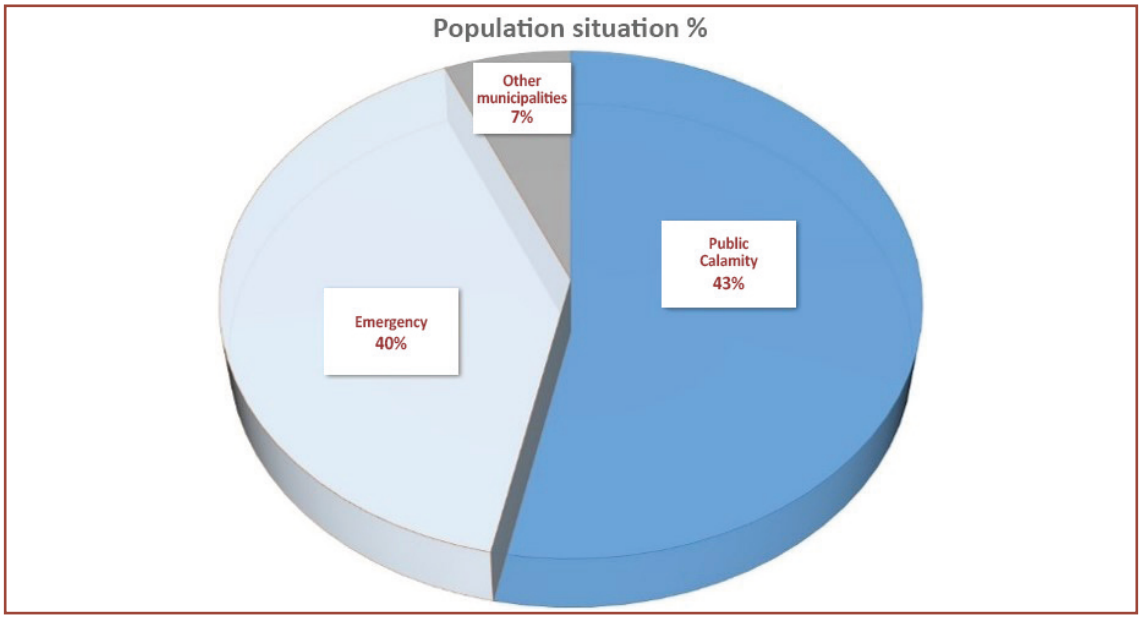
Source: Elaborated by the authors (2024).

According to the legal status of municipalities outlined in State Decree No. 57,646, dated May 30, 2024 (Decree), Figure 1 above shows that 418 municipalities, or 80% of the 497 in the state of Rio Grande do Sul, were in either a State of Public Calamity (14% of them) or Emergency (66% of them). Subsequent analyses of affected areas show that the population in these mu-

nicipalities was affected to varying degrees of intensity. The most severely impacted regions included the state's most populous areas, particularly the Metropolitan Region of Porto Alegre (RMPA), the Serra Gaúcha Metropolitan Region, Vale do Taquari, and the Southern Urban Agglomeration. The official website of the State Government of Rio Grande do Sul, MUPRS — Plano Rio Grande Unified Map, reports that a total of 970,788 people, or 8.9% of the state's population, were directly affected across both classifications.

As of May 31, 2024, over half of Rio Grande do Sul's population (5,783,825 people, or 53% of the total 10,882,965 residents, according to the 2022 Demographic Census) resided in municipalities under the Public Calamity Decree. This designation covered just 95 municipalities, making up 14% of the state's territory (39,833.04 km²) — an area 1.4 times larger than the state of Alagoas and nearly equivalent to 86% of the area of Espírito Santo (see Figures 2 and 3). This affected population is largely concentrated in the RMPA, the Serra Gaúcha Metropolitan Region, Vale do Taquari, and the Southern Urban Agglomeration.

Figure 2 – Percentages of municipal populations in the State of Rio Grande do Sul affected in municipalities according to the situation declared in May 2024 in Decree No. 57,646

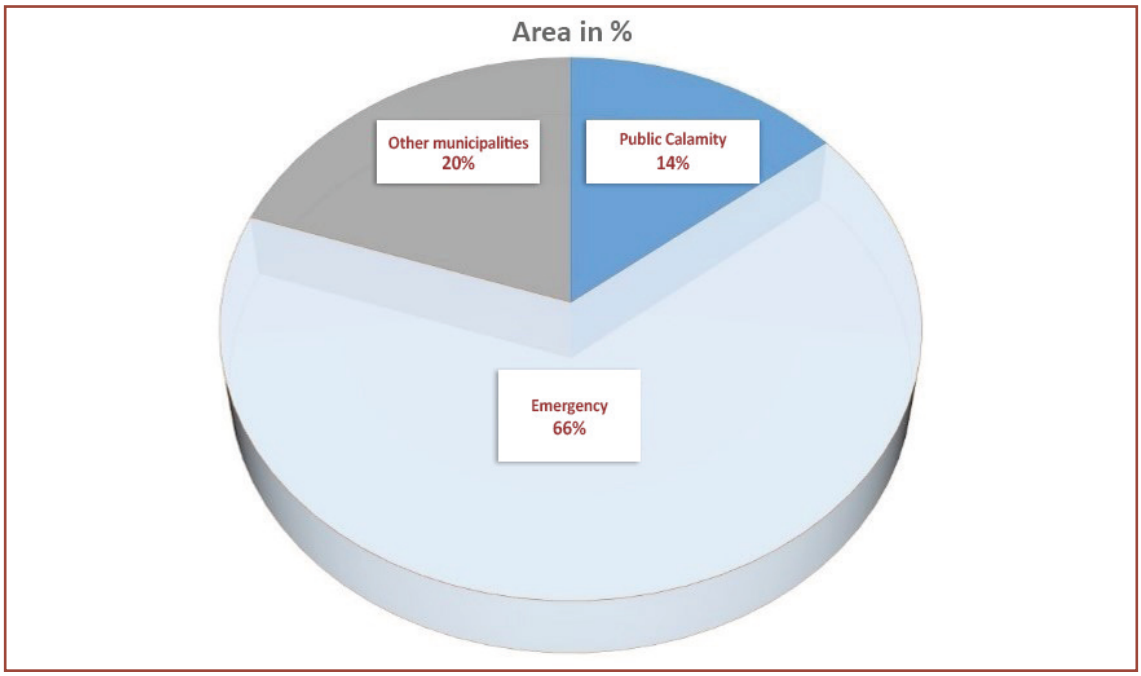


Source: IBGE; State Decree No. 57.646, of May 30, 2024.

In the same State Decree, 323 municipalities — comprising 66% of the state's area (186,334.875 km²), or 4.2 times the area of the state of Rio de Janeiro — were under an Emergency declaration. Less than half of the state's population (4,402,001 inhabitants, or 40%) resides in these municipalities, spread across various regions in the north, west, and south of the state

in the sub-basins of the Uruguay River and parts of the coastline (Decree, 2024; Tribunal de Contas, 2024).

Figure 3 – Percentages of municipal areas in the state of Rio Grande do Sul affected according to the situation declared in May 2024

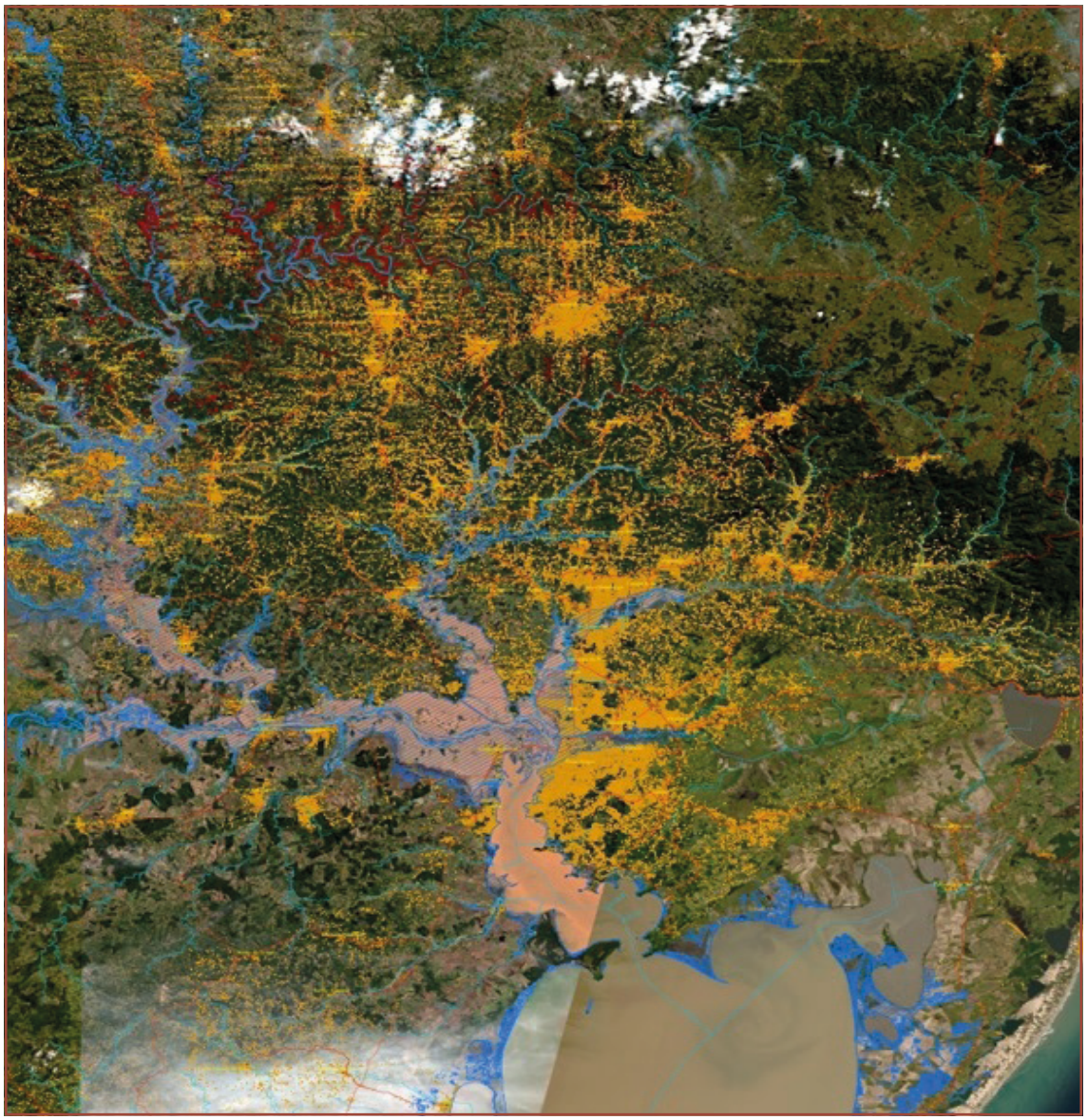


Source: IBGE; State Decree No. 57.646, of May 30, 2024.

The primary concentration of the affected population, as mentioned above, is located in the Guaíba sub-basins, where the main rivers include the Taquari-Antas and Caí in the Serra Geral, and the Baixo Jacuí, Sinos, and Gravataí in the Central Depression, as well as part of the coastline. All rivers in these basins, except those on the coast, flow into what is commonly referred to as "Lago Guaíba".

We prefer the term simply "Guaíba" to refer to this body in the Metropolitan Region of Porto Alegre (RMPA), where it serves as the link between the mentioned sub-basins, the Patos Lagoon, and its estuarine access channel to the Atlantic Ocean in the far south. Guaíba features a striking aquatic and insular landscape in the RMPA, with the Jacuí Delta Environmental Protection Area (22,826.39 hectares), which shares approximately 62% of its territory with the Jacuí Delta State Park (14,242.05 hectares) (Area, 2024). Figure 4 illustrates the Taquari-Antas-Jacuí, Caí, Sinos, and Gravataí river sub-basins, with their waters overflowing into floodplains toward the Guaíba alongside numerous urban areas, highlighting the RMPA and the urban corridors leading to the Serra Gaúcha, the Taquari Valley, and the Central Depression.

Figure 4 – Satellite image of the sub-basins of the Taquari-Antas-Jacuí, Caí, Sinos, and Gravataí rivers, with their waters spreading into floodplains



Source: Research and organization by Marcos Freitas; Operations and Civil Defense Advisory – AODC – of the CBMRS (Military Fire Brigade of Rio Grande do Sul), 2024. Image produced using data from IBGE, NASA Disaster, Programa Brasil Mais, CEMA-DEN, Fepam, and Daer – RS.

Adjacent to the Guaíba and its environmental protection areas are some of the country's largest companies, including vehicle manufacturers, auto parts industries, petrochemical hubs, plastics production, food processing facilities, and health and education services. The metropolitan region encompasses 34 municipalities, housing approximately 4.4 million inhabitants—38.2% of the state's total population (Atlas, 2022). A considerable number of cities, such as Porto Alegre, Canoas, Nova Santa Rita, Eldorado do Sul, Charqueadas, Esteio, Sapucaia, and São Leopoldo, among others, were severely impacted by the flow of water, sand, and debris from all the sub-basins (see Figures 5 and 6).

Figure 5 – Residential homes destroyed by floods and abandoned in Eldorado do Sul

Source: Silvana B. Morandi, August 2024.

Figure 6 – Primary Health Unit in Eldorado do Sul damaged by flooding

Source: Silvana B. Morandi, August 2024.

According to the Hydraulic Research Institute of UFRGS (Repositório, 2024), the Guaíba River reached a historic level of 5.35 meters (with a new flood mark set at 3.60 meters), surpassing the 4.75 meters (flood mark of 3.00 meters) recorded during the region's largest prior flooding in 1941. The entire flood defense system of Porto Alegre and other cities in the Metropolitan Region of Porto Alegre (RMPA) failed. Four major dams were in emergency conditions, one (Cotiporã) partially collapsed, and various levees and floodgates were breached in Porto Alegre and throughout the RMPA.

In Porto Alegre, 22.6% of the municipality's total area and 14.5%, or 2,631 hectares, of its urban area were inundated (Dois Terços, 2024; Fonseca *et al.*, 2024). A total of 46 neighborhoods in Porto Alegre were affected by the flooding. Among the ten most impacted, four were in the northern zone (Sarandi, Farrapos, Humaitá, and São Geraldo), four were in the central region (Menino Deus, Cidade Baixa, Floresta, and Centro Histórico), and two were in the southern zone (Ponta Grossa and Lami) (Munhoz, 2024).

The Metropolitan Region of Serra Gaúcha, an area rooted in industrial and tourism-based economies, is known for automotive manufacturing, vineyards, and the production of high-quality wines and sparkling wines. These industries trace their origins to imperial colonies settled by Italian immigrants, particularly from the Veneto region of northern Italy. This region houses 864,018 residents — 7.9% of the state's population — distributed across 14 municipalities, including Caxias do Sul, Bento Gonçalves, Garibaldi, Antônio Prado, Carlos Barbosa, and Farroupilha (Seminário, 2024).

Between the RMPA and Serra Gaúcha lies the Hortênsias region, a prominent tourist area including municipalities such as Gramado, Canela, and Nova Petrópolis. Smallholders initially settled in these areas, primarily immigrants from the Hunsrück region in southwestern Germany. Here, the sub-basins of the Taquari-Antas and Caí rivers in the Serra Geral and the Sinos River in the Central Depression overflowed, flooding plains and devastating cities and agricultural lands.

In the Lower Jacuí and Taquari/Antas sub-basin, the largest of the Guaíba River basin, municipalities with a smallholder origin, such as the regional hubs of Lajeado and Estrela, were severely affected. Other towns along the Taquari River Valley were impacted, including Roca Sales, Muçum, Arroio do Meio, Cruzeiro do Sul, Forqueta, and Forquetinha. These areas have demographic densities ranging from 50 to 150 inhabitants per square kilometer and are predominantly urban. This agro-industrial region is a significant producer of poultry, eggs, and pork, generating substantial employment opportunities.

As previously mentioned, the Taquari River Valley has been heavily affected since 2023, experiencing three climatic events in September, November, and December that destroyed towns such as Arroio do Meio (see Figure 7), Muçum, and Roca Sales, along with agricultural lands, resulting in numerous fatalities. Similarly, regions within the Lower Jacuí and Rio Pardo sub-basins in the Central Depression, including tobacco-producing areas

like Santa Cruz do Sul, Candelária, and Santa Maria, suffered significant impacts from overflowing rivers and tributaries.

Figure 7 – Current partial view of Arroio do Meio

Source: Luis F. Gomes, April 2024.

Finally, the principal cities of Pelotas and Rio Grande, situated within the Southern Urban Agglomeration, are known for their agropastoral heritage alongside industrial and port activities. The Laguna dos Patos channel, located at its estuary, serves as the terminal drainage point of the Guaíba Basin system into the Atlantic Ocean. Spanning 22 kilometers in length, 2 kilometers in width, and approximately 12 meters in depth, this channel completes the extensive network of the Guaíba Basin system, which became the epicenter of the catastrophe.

LANDSLIDES AND "SCARS"

The intensity of the catastrophe's impacts varied according to municipalities' official statuses of Public Calamity or Emergency Declaration, as previously noted. According to the MapBiomas website, the area affected by mass movements — including landslides, flash floods, and inundations — in April and May was estimated at 15,778 km², equivalent to 5.6% of Rio Grande do Sul's 281,707 km² territory. This area is 6.1 times the size of Luxembourg and larger than Montenegro. A total of 298 municipalities had at least 1% of their territory affected by extreme events, with 73 of these having more than 10% of their area impacted, and 34 exceeding 20%. In Nova Santa Rita and Canoas, located within the RMPA, over half of their municipal territories — 52.5% and 49.0%, respectively — were flooded.

In the slopes of Serra Geral, according to geographer Clódis Andrades Filho of UFRGS, 16,862 rupture points were recorded, devastating agricultural

lands and small rural towns like Roca Sales (see Figures 8 and 9). Comparatively, these landslides were at least three times more severe than the 2011 event in Petrópolis, Rio de Janeiro, highlighting the magnitude of the climatic events in Rio Grande do Sul as among the most significant in Brazilian history (Andrades Filho; Mexias, 2024).

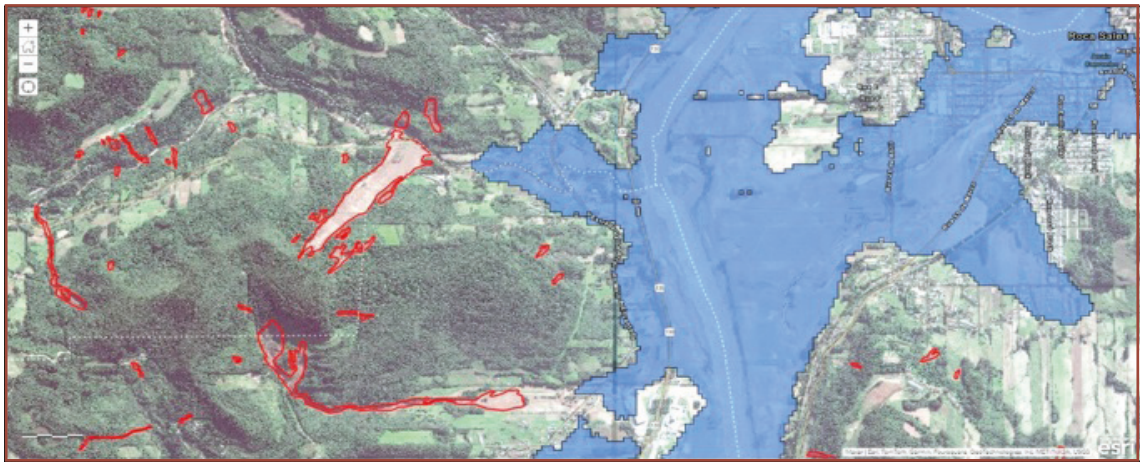
Figure 8 – Landslides in Serra Geral in Santa Tereza municipality, Taquari-Antas Valley

Source: Drone photo by Clódis Andrades Filho, 2024.

Geographer Roberto Verdum commented on landslides after conducting field observations in Linha Alcântara (see Figure 10) in the municipality of Bento Gonçalves:

> The scale of what we witnessed there is colossal, and no engineering solution can address all the events that have occurred or those yet to come, especially given the predicted rains for September and October.
>
> There is a fundamental issue tied to the genesis of Brazil's land tenure question that must be explored: the title of the land — but this land has vanished, along with families! Today, there is nothing but exposed rock... (Verdum, statement, August 6, 2024).

Figure 9 – Floodplains in the Taquari-Antas Valley in Roca Sales, highlighting landslides (in red)



Source: Research and organization by Clódis Andrades Filho; Lorenzo Fossa Sampaio Mexias, 2024. Available at: https://arcg.is/ezjvW.

Figure 10 – Landslide in Linha Alcântara (Bento Gonçalves) near the Antas River

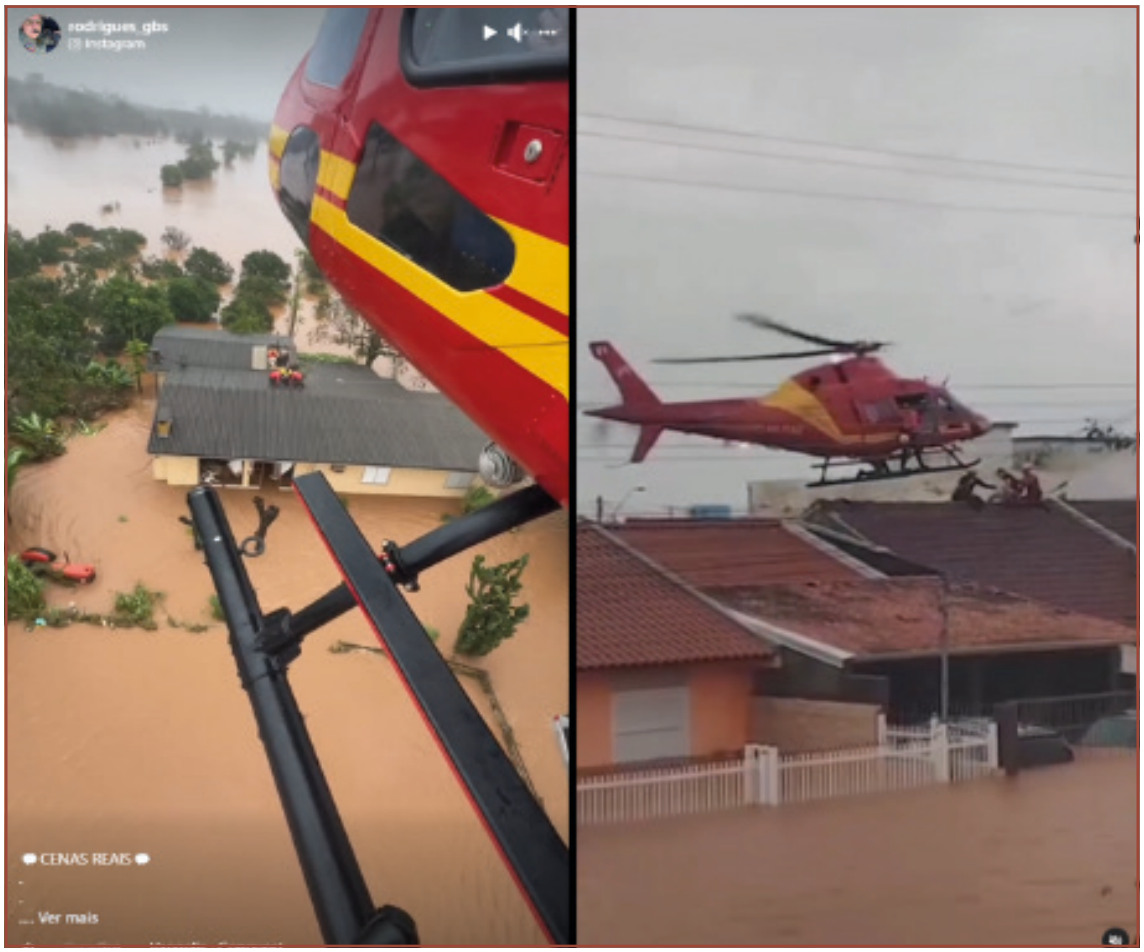
Source: Roberto Verdum, August 2024.

RESCUE OPERATIONS

According to the latest data released by the Civil Defense of Rio Grande do Sul, updated as of August 20, 2024, over 2.4 million people were affected by the disaster; more than 442,000 residents were displaced (approximately 18,000 in shelters and 423,000 homeless); 183 lives were lost; 806 people were injured; and 27 remain missing (Defesa, 2024). By late August 2024, around 2,500 people were still homeless, distributed across 26 shelters and three Humanitarian Reception Centers in 29 municipalities, with most concentrated in Porto Alegre, Canoas, and Encantado (Costa, 2024). In Por-

to Alegre, some public buildings and decommissioned hotels were occupied by displaced residents. One notable case involved residents from affected island areas occupying the Hotel Arvoredo in the city center, only to be evicted under judicial orders of repossession. The Supreme Federal Court later reversed this decision, ruling in favor of the displaced residents.

Figure 11 – Scenes of aerial rescues by the Fire Department in the Taquari River Valley



Source: https://www.facebook.com/reel/758618286459168 and https://www.instagram.com/p/C77j-clvdgx/.

In a survey conducted by the Rio Grande do Sul Fire Department in partnership with UFRGS, coordinated by geographers Marcos Freitas and Letícia F. Sartorio, search and rescue efforts for the missing between early May and August 8, 2024, covered an estimated 6,500 km², impacting approximately 670,000 people (Freitas *et al.,* 2024). Media reports indicate that over 11,000 animals were rescued across the state (Agência Brasil, 2024). Rescue operations involved aerial, aquatic, and underwater efforts, with support from fire departments from all over the country. Humanitarian aid also poured in from across Brazil and abroad.

IMPACTS ON CIRCULATION INFRASTRUCTURE

The disaster devastated circulation infrastructure, with bridges and roads destroyed across the affected regions. The capital, Porto Alegre, was left without external land or air connections, save for a single narrow route leading to the coast, through which thousands fled to beach cities like Capão da Canoa, Tramandaí, Torres, and the Santa Catarina coast. The city's iconic interstate/international bus terminal was flooded, and the few bus lines still able to reach the city via coastal routes were relocated to an urban terminal in the eastern zone. Approximately 70 establishments, including convenience stores, restaurants, and ticket booths, were closed in May. Partial losses within these businesses were estimated at no less than R$8 million, according to the Association of Bus Station Business Owners of Porto Alegre (Aeerpa; Plentz, 2024).

The Trensurb metro system, which serves the RMPA and operates along the heart of the flood zone, was severely impacted. Once carrying over 200,000 daily passengers at its peak in the early 2000s, the metro had been transporting approximately 120,000 passengers per day before the disaster. Flooding in May 2024 nearly destroyed the network, damaging traction energy systems, signaling, ticketing, communications, permanent tracks, and maintenance facilities. The system's IT infrastructure was transferred during the flood to the federal IT service, Serpro, in Brasília.

Figure 12 – Niterói Station of Trensurb Metro flooded in Canoas

Source: Trensurb, 2024.

Worker mobility in the Metropolitan Region of Porto Alegre (RMPA) via the train system was severely disrupted by the catastrophe. However, as early as May 30, while the southern portion of the RMPA's transportation system remained flooded, the company launched the "Humanitarian Rails Operation", providing free service between Novo Hamburgo and Mathias Velho stations (in the Canoas district). As of July 13, the R$4.50 fare was reinstated, but with the guarantee of free travel completion through the company's shuttle services. Since September 20 — a date commemorating the Farroupilha Revolution — trains have been reaching one of the central stations in the capital, Farrapos Station. Service is expected to extend to Mercado Station, the most central hub, by December 24, 2024

Salgado Filho International Airport was flooded, affecting both its logistical facilities and main runway. Emergency air travel operations were implemented by the Brazilian Air Force, while smaller regional airports, such as those in Caxias do Sul, Passo Fundo, Santa Maria, Pelotas, Santo Ângelo, and Uruguaiana, were activated. Additionally, the airports in Florianópolis and Jaguaruna, in the neighboring state of Santa Catarina, began to provide support, receiving passengers from Rio Grande do Sul. The number of flights at the international airport dropped from 2,588 in April to just 154 in June, with passenger numbers falling by 92.69% compared to that month's typical traffic (Aires; Coan, 2024).

Partial operations resumed on October 21, while full-scale operations, including major flights, are anticipated only by December 16, 2024. The estimated financial loss to Rio Grande do Sul's productive and tourism sectors is approximately R$400 million per month (Fechamento, 2024). The partial reopening on October 21 was celebrated by federal government ministers, state governor Eduardo Leite, and other officials who attended the ceremonial event. Azul Airlines, the first company to resume flights, prominently displayed the state flag of Rio Grande do Sul in a clear act of promotional marketing.

SUPPORT FROM FEDERAL AND STATE GOVERNMENTS FOR RECONSTRUCTION

Both federal and state governments established financial support mechanisms with dedicated funds for rebuilding key sectors, including public schools, roads, Salgado Filho International Airport, Trensurb Metro, hospitals, housing, flood containment, prevention, and social assistance. As of October 31, 2024, federal and state resources allocated for reconstruction amounted

to R$111.5 billion, with 47.3% already disbursed. Of the R$3.8 billion allocated by the state, R$2.4 billion (55.5%) had been distributed (Painel, 2024).

The federal Ministry of Reconstruction in Rio Grande do Sul operated locally for four months, concluding its activities on September 11, 2024. It was subsequently restructured as a Secretariat for Reconstruction Support within the Executive Office of the Chief of Staff, with a budget of R$6.5 billion. Additionally, the federal government advanced R$5.132 billion in precatory payments already owed (Nuñez, 2024). The state government, in turn, established the Secretariat of Reconstruction of Rio Grande do Sul, approved by the Legislative Assembly on May 29, 2024 (Salomão; Santos, 2024; Rio Grande do Sul, 2024).

Various credit lines for the productive sector, for instance, are sourced from programs and funds such as Pronampe (National Support Program for Micro and Small Enterprises), the Social Fund, FGI credit (Investment Guarantee Fund) for small and medium-sized enterprises, Pronaf (National Program for Family Agriculture), and funding from Finep (National Agency for Studies and Project Funding). For housing, the federal government has allocated R$ 2 billion for the purchase of 17,300 residences, while the state government plans to invest R$ 66.7 million in the installation of 500 modular housing units. R$150 million was invested by the federal and state governments in the recovery of public schools (Painel, 2024).

DISASTER CAPITALISM AND UNVIABLE PROPOSALS

Amid the immensity of the tragedy, the government of the state of Rio Grande do Sul and the municipal administration of Porto Alegre hired expensive international consultancies — including technicians from the Netherlands — both with financial support from the government of that country at first, as well as with their own resources. The consultancy firms have reiterated what local experts have been saying — and warning about for years — that Porto Alegre's flood protection system is effective but has suffered from a lack of maintenance. Well-known and widely discussed were the attempts by both the state government and Porto Alegre's municipal administration to dismantle the flood protection wall, commonly referred to as the "Mauá Wall." Governor Eduardo Leite stated when announcing the call for bids for the revitalization of the Cais Mauá in Porto Alegre in September 2023:

> An old port of Porto Alegre, revitalized, with people freely circulating, without that wall dividing the old port from the city, and there, in those old warehouses,

> restaurants, cultural spaces, leisure areas, coworking spaces, innovation hubs—all with people freely moving around, without needing to pay anything to access the area (Eduardo Leite launches bid. 2023).

However, the severity of the climate disaster revealed the recklessness of proposals to dismantle the flood protection wall or even adapt it to "flexible forms" as part of a billion-dollar urban development project at the Cais do Guaíba. Despite the tragedy, it does not appear to have prompted a review of the contracts with the Pulsa RS Consortium, which won the bid for the urban development and commercial exploitation of the old port area. Recent reports indicate that the consortium intends to sign the contract but will propose a change: prioritizing the construction of new flood protection to safeguard the Cais area from future inundations (Farina, 2024).

Disasters such as Hurricane Katrina in New Orleans (August 2005) in Louisiana, USA, the Mariana dam collapse (November 2015), and the Brumadinho dam disaster (January 2019) in Minas Gerais, Brazil, as well as the recent events in Rio Grande do Sul, have fueled what Naomi Klein conceptualizes as "disaster capitalism" in her book The Shock Doctrine: The Rise of Disaster Capitalism (Dias, 2024). Financial consulting firms increasingly view such tragedies as opportunities for new business ventures, including privatization of public institutions. This has been evident with Alvarez & Marsal — a firm specializing in the recovery of failing businesses and banks, often referred to as *turnaround* — which offered free services to assist in Porto Alegre's reconstruction, gaining access to the municipality's data systems. Similarly, the government of Rio Grande do Sul engaged Alvarez & Marsal, followed by McKinsey and Ernst & Young, to design the "New Development Agenda for Rio Grande do Sul".

In response to the bottleneck of floodwaters in the Guaíba caused by strong southern winds that delayed flow into the Laguna dos Patos and then to the sea, some proposed a far-fetched engineering solution to create a new drainage channel from the lagoon to expedite the outflow of accumulated water. This suggestion faced widespread criticism and has apparently been shelved due to its impracticality and the environmental risks it would pose to the entire coastal-lagoon system.

TESTIMONIES FROM FLOOD VICTIMS

Some collected testimonies illustrate the experiences of those affected by the flooding, including the following accounts from Bento Gonçalves, Eldorado do Sul, and Porto Alegre.

> We lost friends and neighbors in the landslides at Vale Aurora here in Bento Gonçalves. Landslides haven't stopped — over 100 in Faria Lemos alone. We also went a week without water. — Tiago Zillio, Bento Gonçalves, May 13, 2024.
>
> There were 26 people with their pets (...) In the kitchen, with water above our knees, I felt like I was on the Titanic, where the musicians kept playing while the ship sank... And here I was, cooking pasta as the house flooded. – Marquerita Martins, Eldorado do Sul, August 17, 2024.
>
> (...) They fled in a rush, just trying to save their lives. It was unbelievable yet inevitable. The water consumed the entire house — only the roof's peak remained above. — Amanda Bahi de Souza, Porto Alegre, August 14, 2024.

The emotional impacts are equivalent to war trauma. People are disoriented and deeply depressed, having lost loved ones, homes, neighborhoods, jobs, and a sense of belonging, as psychiatrist Jéssica Martani explains: "Sounds, images, and emotions from the traumatic moment resurface, beginning to affect the quality of life" (Machado, 2024).

FINAL CONSIDERATIONS: THE CURRENT SCENARIO

It is almost unnecessary to state that the tragedy in Rio Grande do Sul was felt across the country and beyond. However, with few exceptions, international media coverage was sporadic, failing to systematically convey the gravity and scale of the disaster in southern Brazil. In scientific circles, however, the tragedy underscored a longstanding concern: the climate crisis. As Pillar and Overbeck commented in science:

> The catastrophic floods that affected southern Brazil last May should serve as a warning to human societies that, despite the still widespread climate change skepticism or denial, mitigation and adaptation to cope with the ongoing climate crisis are urgently needed (Pillar; Overbeck, 2024).

From January to September 2024, Brazil experienced another climate extreme: wildfires, further deepening the grim scenario widely predicted by renowned national scientists like Carlos Nobre. In a recent interview, he remarked: "I am terrified. No one anticipated this; it's happening so quickly." Speaking about extreme heat and the fires, he added: "(...) this is the worst we've experienced. The crisis has exploded. We are facing the highest temperatures the planet has experienced in 100,000 years" (IHU. Unisinos, 2024b). The recent tragedies in Valencia and Barcelona, Spain, alongside numerous other catastrophic events, reinforce the assertion that the planet has reached alarming thresholds.

The agribusiness *lobby*, both in Congress and in Rio Grande do Sul's Legislative Assembly, has systematically worked for years to weaken environmental

legislation in favor of exporting low-value-added commodities, says geographer Francisco Aquino. "The loosening of regulations protecting riverbanks, wetlands, flooded areas, and ecosystems, combined with greater expansion into biomes and preservation areas, directly contributes to the intensification of climate change and disasters" (IHU. Unisinos, 2024a). Environmental self-licensing was proposed by Governor Eduardo Leite in 2019 and approved by the Legislative Assembly that same year, although the issue is still under review by the Supreme Federal Court (STF).

In October 2024, during municipal elections, a major debate focused on how to rebuild and improve the defense systems of cities — not only the capital but also cities in the Greater Porto Alegre Metropolitan Region (RMPA) and devastated areas. Topics included relocating entire neighborhoods from flood-prone zones in river valleys, constructing the Eldorado do Sul protection dike (part of the federal government's Growth Acceleration Program — PAC), and more. The case of Porto Alegre's election proved emblematic. Despite criticism of the municipal administration for failing to maintain the city's flood protection system or the pumping stations meant to return water to the Guaíba River, Mayor Sebastião Melo (MDB) was reelected with 61.53% of the vote, defeating Maria do Rosário (PT), who garnered 38.47%.

The contradictions were even starker in neighborhoods hit hardest by the floods, such as Sarandi in the city's northern zone, near the airport, where 26,042 residents were affected in 8,172 properties. Sociologist Marcelo Kunrath Silva, in his article "Os donos de Porto Alegre" (The Owners of Porto Alegre), identified over 500 points of action led by businesspeople linked to Mayor Sebastião Melo during the city's flooding. Rescue operations supported by private boat and jet ski owners, along with various donations, support in shelters, and organized social media groups providing cleaning supplies and services, were pivotal to the mayor's reelection. This narrative of the positive role of the business sector during the catastrophe prevailed over accusations of federal government absence, a discourse amplified by conservative platforms like Brasil Paralelo, among others. ●

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