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Climate emergencies in southern Brazil: a report on the floods in Rio Grande do Sul in 2024

Emergências climáticas no sul do Brasil: um relato pessoal sobre as enchentes no Rio Grande do Sul em 2024

Magayo de Macêdo Alves
Universidade Federal de Pelotas (UFPel)
Doutorando do Programa de Pós-graduação em Ciência Política da UFPel (PPGCPol/UFPel)
magaio_n@hotmail.com
https://orcid.org/0000-0002-9881-5982

Etiene Villela Marroni
Universidade Federal de Pelotas (UFPel)
Docente do Programa de Pós-graduação em Ciência Política da UFPel (PPGCPol/UFPel)
evmarroni@gmail.com
https://orcid.org/0000-0001-8067-5865

Gustavo Gordo de Freitas
Universidade Federal de Pelotas (UFPel)
Doutorando do Programa de Pós-graduação em Ciência Política da UFPel (PPGCPol/UFPel)
gustavogordof@gmail.com
https://orcid.org/0000-0001-8832-2917

Abstract
This report seeks to present and discuss the author's impressions and experiences going through one of most catastrophic natural phenomena in the Brazilian state of Rio Grande do Sul's recent history, as well as the political implications caused and/or influenced by the floods. Following bibliographic research on the state's Environmental and Infrastructure Agency, coupled with experts' opinions this report draws on the idea that lack of emergence preparedness by state authorities has contributed to aggravate the scenarios observed throughout the state, calling for more cohesion and public transparency as tools to avoid further damage.

Keywords: Rio Grande do Sul. Floods. Climate.

Resumo
Este relato busca apresentar e discutir as impressões e experiências do autor ao vivenciar um dos fenômenos naturais mais catastróficos da recente história do estado brasileiro do Rio Grande do Sul, bem como as implicações políticas causadas e/ou influenciadas pelas enchentes. Através de uma pesquisa bibliográfica no portal da Agência Ambiental e de Infraestrutura do estado, combinada com opiniões de especialistas, este trabalho sustenta a ideia de que a falta de preparação para emergências por parte das autoridades estaduais contribuiu para agravar os cenários observados em todo o estado, indicando a necessidade de mais coesão e transparência pública como ferramentas para evitar danos futuros.

Palavras-chave: Rio Grande do Sul. Enchentes. Clima.

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Introduction

Located in Brazil's southernmost region, Rio Grande do Sul (RS) is one of the country's most populous states, having a population of 10,882,965 inhabitants (IBGE, 2022). Spanning 281.707,151km², its territory – an area showcasing a rich tapestry of landscapes that range from traditional vineyards to rolling hills and coastal regions – is as diverse as its people, many of whom are of European descent (Germans, Italians, Polish etc). This demographic composition contributes to a cultural landscape that blends traditions, languages, and cuisines, making RS a melting pot of heritage and innovation. Starting 2024, the state as a whole was hit by several floods, who took the lives of dozens of people, leaving a path of destruction behind, as many others found themselves stranded by the surge in water levels. This unprecedented phenomenon has prompted cities, state and the federal governments to act as fast as they could in order to avoid more casualties. Aside from these responses, volunteers from across RS, as well as from other states have joined forces to assist those in need, gathering and delivering a variety of supplies in several locations. Primarily working as one in the city of Pelotas, I was able to witness firsthand the constant efforts and attempts made by those who spent days and nights assisting affected individuals and communities who otherwise would not have their basic needs met, given the surge in demand and the limited resources available at the time. The following image depicts some of the work done by them (Image 1).

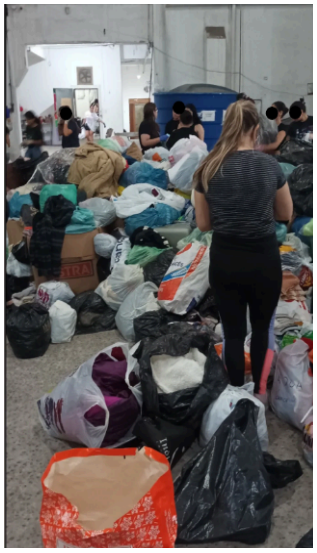

Image 1 – Volunteers in Pelotas/RS.
Source: author's image.

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In the city of Pelotas, water levels rose above normal mainly in some suburbs, forcing residents to evacuate and head for temporary shelters. In fact, according to the City's office, on May 13, 2024 hundreds of residents had been displaced by the floods, which led then mayor Paula Mascarenhas sign an executive order (*decreto 6.871/24*) officially declaring *State of Public Calamity*, which, in turn, aligned with state measures that through the same type of procedure (via *decreto* 57.626) increased the number of cities in need of federal assistance from 46 to 78[1]. At the same time, other pieces of legislation were enacted, such as *decretos* 6.873 and 6.874 respectively, seeking to suspend classes in some schools located in risk zones, and regulate channels for financial donations. Though not as affected as its rural neighbourhoods, some urban areas have also seen the impacts of the floods, particularly in coastal communities, such as the *Quadrado* region, shown in the images below (Image 2):

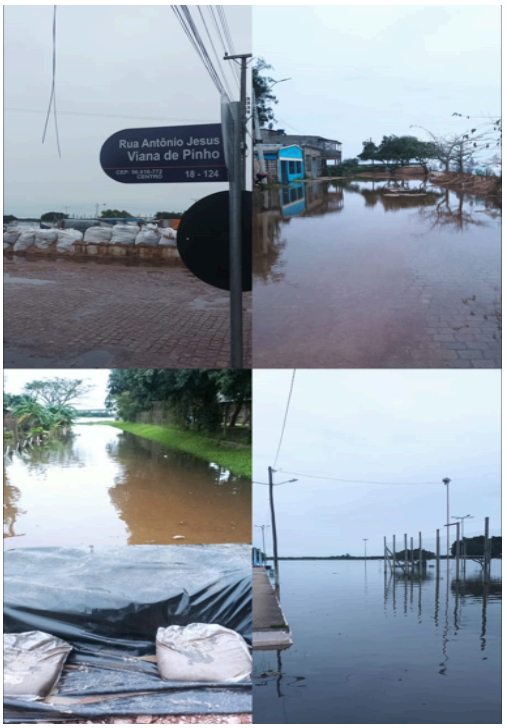

Image 2 – Floods in Pelotas (*Quadrado* region).
Source: author's images.

[1] Not to confuse *State of Public Calamity*, where damage levels (either imminent or already in course) with *State of Emergency*, where, as the name suggests, there is still some level of control and ability to handle issues by municipal and/or state authorities alone.

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Personally, I have volunteered in both food banks and church shelters, seeing first-hand the devastating effects such climate emergency has put families, and particularly children through, many of whom lost all of their belongings, thus needing not only a roof, but also clothes and meals. Mainly using social media apps, locals were able to provide some comfort to the affected, gathering donations from across the city and beyond for this.

Climate change discussions, such as in Rizzotto, Costa and Lobato (2024), has emphasized that the increasing frequency and intensity of climate emergencies in regions like RS will likely exacerbate existing vulnerabilities for individuals and communities. The fluctuation of weather patterns, driven by phenomena like the El Niño Southern Oscillation (ENSO), poses significant risks not only to crop production, as explored by Júnior *at al.* (2020), but also to food security and local economies, by, for example, increasing the likelihood of zoonoses, according to Melgarejo (2024). As the southern region grapples with unpredictable rainfall and temperature extremes, farmers may face declining harvests, increased costs of adaptation, and the potential for devastating losses. This ripple effect could extend beyond agriculture, influencing related sectors such as transportation, trade, and labour markets. Noskoski and Gysi (2024) say this could be reduced if sustainability were at the centre of governmental efforts.

Furthermore, the socio-economic fabric of communities in RS could be severely interwoven with the consequences of climate variability. Families that depend on consistent agricultural output for their livelihoods are increasingly at risk of displacement and economic instability, leading to a decline in quality of life. The diminished resilience of farming systems not only threatens individual households but also challenges regional stability, as job losses in agriculture can lead to increased poverty rates and social unrest. The literature, such as in De Assis *et al.* (2024) or Silva (2024), seems to highlight the urgent need for adaptive strategies and policy interventions that address these intertwined challenges, ensuring that local communities can better withstand the mounting pressures of climate emergencies while safeguarding their economic and social wellbeing.

In summary, the discussion of climate change effects is not new. Throughout the world, a variety of political mechanisms have been enacted as mankind tries to reduce the damage already taking place. However, much like in RS, environmental, and consequently, humanity's own

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protection depends on the quality of actions taken. In other words, the implementation of measures to concretely address the causes and avoid even more losses in the political chess that climate discussions have turned themselves into. Rio Grande do Sul is just one among many places that will continue to suffer should communities and governments not work together to solve or at least minimize what is happening.

Methodology

This paper used bibliographic research for official and academic sources, respectively the website of Rio Grande do Sul's Environment and Infrastructure Agency, coupled with scientific literature.

Rio Grande Plan

In May 2024, the RS government released a plan to rebuild what had been destroyed and/or lost by the floods, ultimately seeking to assist people and communities affected by it[2]. In its own words, the *Rio Grande plan* aims to foster 'Reconstruction, Adaptation, and Climate Resilience of Rio Grande do Sul' by proposing 'measures to mitigate the impacts caused by the floods that devastated the state in 2024'. The image below shows the document in question[3]:

[2] For the full version of the Plan (in Portuguese):
https://admin.reconstrucao.rs.gov.br/upload/arquivos/202406/26084455-2024-06-24-doc-plano-rio-grande-v3.pdf
[3] In direct translation, the cover of the document mentions 'structural projects' and 'ongoing document', as initiatives and projects are still under development (hence the indication that it is the first version, yet to be updated).

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Image 3 – The Rio Grande Plan.
Source: Rio Grande do Sul government.

A more detailed look into its contents reveals that actions were planned under three main axes, each on which laid out in sections 2 (*resilience),* 3 (*preparation*) and 4 (*reconstruction).* Respectively, the first one seems to be mainly focused on increasing sanitation levels by, for example, improving sewage systems, desilting rivers, and establishing partnerships with private actors for better infrastructure in general. The second is characterized by topographic mapping followed by the implementation of monitoring systems that together seek to foster environmental education among residents, improving general awareness on the impacts and attitudes to have in the event of floods and other climate-induced phenomena. Finally, through the state's Logistics and Transportation Agency (SELT), as well as the Department for Roads (DAER) and the Gaúcho Reconstruction Agency (SERG), the RS government has planned on rebuilding nine bridges that according to it were severely affected by the events, together with public buildings and roads. The plan also includes the construction of temporary housing for the individuals and communities affected, that in the long intends to become a permanent fix by building permanent houses (page 49). These strategies seem to indicate that policies and overall planning have been put into place to also prevent new losses, however, critics suggest that responses may have come too late and that the state policies in general, primarily represented by its Environment Code do not reflect any real

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commitment to change. The section below introduces this argument by providing evidence that it may, in fact, be the case.

Results and discussions

The state government arguably has a fairly comprehensive environmental legislation, covering a variety of topics. Its website[4] lists fifty laws dealing with matters that range from solid waste management (*Lei n. 14.545)* to biogas and biomethane (*Lei n.* 14.864) and solar energy (*Lei n. 14.898*). Nevertheless, through *Lei n.* 15.434, the state has established its own Environment Code in 2020 (*CEMA*, in Portuguese). A search in of all the 233 articles it contains reveals that the Portuguese word for *flood* ('enchente') is not mentioned anywhere, whereas an equivalent (*'cheias'*) is found once in the section dealing with a system to avoid floods ('The State will maintain a System for Forecasting, Prevention, Alert, and Response to Hydrological and Ecological Incidents and Accidents.' Article 131). Similarly, the word for rain ('chuva') is only mentioned in the beginning of the Code (article 2, section V) in the initial definitions of words and expressions that will be used (in this case, *wetlands*). This apparent lack of responses was noticed by Ferraz and Becker (2020) who – one by one – examined each of CEMA's articles to conclude that its current form not only substantially alters what existed until then, but it also significantly reduces the chances of success in environmental protection by removing 'guidelines for impact studies and reports, as well as the tools and mechanisms for air quality control'. In summary, in their own words: 'what has not been eliminated has been weakened'.

Climate change has already shown a plethora of effects in the state, as pointed out by Berlato and Cordeiro (2020). According to them, average temperatures have increased. And this in itself can potentially affect ecosystems and economic chain productions that rely on weather conditions to function properly. Therefore, the results seem to indicate that if state legislation, as well as implementation of what has been decided do not work together to modify or at the very least support and promote initiatives that address environmental issues, the next couple of years may become even more challenging for RS residents, as ideal climate conditions for human development will likely worsen, and therefore, impact everyone's lives, in ways yet to be fully known. But not only that. According to Possamai, Serigati and Bastos (2024) the state of Rio Grande do Sul has a considerable importance in terms of agriculture for the rest of Brazil. They mention that in the

[4] For further information: https://www.sema.rs.gov.br/legislacao-ambiental.

2023/2024 harvest season, the state alone was responsible for 69,3% of all national rice production, even considering the floods, not to mention wheat (46,1%), soy (14,5%) etc. Hence, we conclude the argument by showing that by affecting the state, climate change has also impacted the country in its entirety by extension.

Conclusion

The state of Rio Grande do Sul has endured many obstacles and challenges in its history. In the XXI century, more than ever before, it needs to think of ways to concretely implement the many plans and ideas already in place to protect its people and environment from further destruction caused the by increasing instability and severity of weather conditions. The quality of the actions taken now will likely determine the outcomes and therefore effectiveness of municipal and state actions. Playing a vital role in Brazil's economy, we conclude that its protection means that the country as a whole will have more chances to grow and prosper, as its future, in part, depends on what both nature and human communities will look like in the RS of next couple of years.

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