

Climate disasters and their lessons

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In late April 2024, an environmental catastrophe unfolded in Brazil's southernmost state, Rio Grande do Sul. Torrential rains, far exceeding historical averages, led to widespread flooding, affecting the lives of over two million people and leaving the majority homeless. Approximately 250,000 families lost their homes, and around 200 people were either killed or remain missing. While the loss of life is incalculable, the emotional toll, alongside the material damage, is immense. The heavy rains continued for over a month, impeding rescue efforts and compounding the economic losses and disruptions to daily life in the region.

However, this disaster was not unforeseen. Climate science has made significant strides in recent decades, thanks to advancements in new techniques—such as satellites, computer models, large-scale monitoring, studies on natural cycle dynamics, and assessments of human impacts—and the availability of comprehensive data, including reliable historical databases. These advancements have enabled the development of increasingly accurate and reliable simulation and forecasting models.

Scientific evidence has increasingly indicated that we must expect more frequent and intense extreme weather events. We have been passive witnesses to floods and landslides in various regions of Brazil: Rio de Janeiro, São Paulo, Santa Catarina, the Zona da Mata in the Northeast, and even in Rio Grande do Sul itself. We have also experienced historic droughts in the Amazon and the semi-arid regions. It appears that the long term is becoming increasingly short, as the scenarios forecasted by scientists are materialising even earlier than anticipated.

Scientists have also shown that these extreme weather events can cause disasters with increasingly severe impacts when they occur in areas that have lost resilience due to the removal of native vegetation, the alteration of river courses, and other land uses that compromise the integrity of ecological processes. Such conditions accelerate the water cycle, causing water that reaches the land with significant intensity and volume to flow swiftly into lower-lying areas, resulting in floods and inundations. This also leads to the movement of sediments or even large masses of earth, causing entire hillsides to collapse in landslides.

Despite the numerous human tragedies and material losses wrought by climate change, public policymakers and environmental exploiters appear to have remained unmoved by the role human activities play in amplifying the impacts of extreme events across various regions in Brazil.

Very little, if anything, has been done to prevent the dramatic effects of climate change and the improper use of land surfaces.

It is important to recall that since the early days of significant environmental warnings in the second half of the 20th century, science has been drawing attention to the risks inherent in our production model. This model relies on technologies that treat nature merely as a resource provider, disregarding

its crucial regulatory role in delivering environmental services. The model also prioritises consumerism as a driving force of the economy, leading to raw materials and energy waste.

One of the seminal works that effectively explained the folly of the logic that has prevailed since the acceleration of industrial processes is G. Hardin's 1968 study, which highlighted the dramatic consequences of the "every man for himself" mentality. Hardin illustrated that if each producer, without predetermined rules (the study refers to common lands with free access), seeks to extract the maximum from nature without considering that others will do the same, the collective action will ultimately result in severe damage to each individual. This is akin to what occurs nowadays when farmers deforest large plots of land to secure short-term financial returns without considering that their neighbours will act similarly. The underlying assumption is that the negative consequences of such resource use patterns will only manifest in the distant future when they will no longer affect us, as some solution will have been found. This phenomenon has been termed the "tragedy of the Commons". The inevitable and obvious result of this disregard for the future is a disruption in the climate's regulatory function, which is maintained by forests, rainfall patterns, and ocean dynamics.

A similar tragedy is unfolding today. But since this is now a chronicle of a recurring, foreseen, and announced tragedy, it is worth recalling Karl Marx's observation from around 180 years ago: "History repeats itself, first as tragedy, second as farce" (Marx, 1852).

It cannot be said that there was no warning. What has been—and remains—lacking is the understanding that even if each individual action constitutes only a small drop in the ocean of disturbances imposed on nature, the sum of all these actions will ultimately result in an overflow, quite literally. What is also lacking is political will and determination. Regulating the relationship between humans and the natural environment cannot simply be left to the good sense of individuals. While good sense is a necessary component, it is far from sufficient. Public authorities and organised civil society must be the primary guardians against disasters and tragedies.

The tragedy in Rio Grande do Sul should be viewed as a lesson, and its lessons must be carefully identified. It is, therefore, crucial to highlight the imperative of reassessing how different sectors of society perceive the concept of time:

- The "time" of politics is short, generally spanning four-year cycles. Historically, politicians and rulers have followed the logic that it is not worth investing in major preventive works that would only serve to mitigate the effects of rare extreme events. Projects that bring immediate electoral dividends are given greater weight in their decision-making process. They gamble that such tragedies are rare and are unlikely to occur during their political terms.
- The "time" of individuals is much longer than that of politicians. While our lives are vulnerable to extreme events, culturally, we have been conditioned to view these events as so rare that they are unlikely to occur tragically within our lifetimes. This perspective is changing as climate change rapidly worsens and becomes more frequent.
- The time of nature is immense. This means that when politicians leave office, the burden of losses remains on those who elected them and also on their descendants. The resilience of nature's services may be approaching points of no return.

The economic and political calculations of decision-makers, which often involve a reckless disregard for the risks posed to people and infrastructure, can no longer prevail over reason, foresight, and accountability.

In relation to risk, it is pertinent to recall Ulrich Beck's argument that risk in our society is unequal, affecting the less privileged with greater frequency and severity. It is also crucial to ensure that whenever

preventive or emergency adaptation measures are taken, these do not exacerbate the inequality of risks within our society.

In addition to the conflict between temporal logic and risks, it is also important to bear in mind that the dynamics of politics—which dictate the behaviours of economic agents and their relationships with governmental structures—are fundamentally rooted in a certain complacency that conspires against the sustainability of people’s daily lives. Economic agents seek to “socialise” (in the sense of sharing the burden) the environmental costs of their activities; political agents turn a blind eye to this, arguing that these agents drive income and job creation. An example is the ongoing deforestation of forests and the vegetation that lines watercourses. The tragedy of flooding is closely linked to this pattern of behaviour.

As long as regulations remain merely *pro forma*, we will increasingly be faced with farce: some will pretend to fulfil their roles, others will pretend that everything is under control and that the damage they cause is minimal, assuming that their neighbours will not act in the same way; while the problems, once anticipated in the distant future, are now at our doorstep.

From an economic perspective, the total cost of the tragedy in Rio Grande do Sul is still unknown, but it may exceed 1% of Brazil’s GDP¹. Jobs have been lost, productive capital destroyed, agricultural land swept away by the waters, and infrastructure devastated. The effects will be felt for many years to come.

One question remains: when will our leaders and society realise that it is far more prudent to invest in the prevention and adaptation to climate change than to bear the costs of its consequences? And when will they use these tools to promote greater equality and socio-environmental justice?

In this edition, SiD presents the Dossier “Biocultural diversity and bioeconomy(ies): dialogue between concepts and dimensions for a sustainable future,” featuring seven articles, three in the *Varia* section, along with an Opinion work.

As part of the *Dossier*, Burgos & Mertens discuss opportunities and challenges for developing the baru nut supply chain in the Cerrado, while Silva *et al.* present research findings on the marketing channels for tucumã, a product harvested by riverside communities in the Amazon. Following this, Valadão & Souza analyse the financial and economic viability of baru nut agro-extractivism in Minas Gerais, and Nascimento *et al.* explore bioeconomy and climate change, shedding light on the experiences of agro-extractive cooperatives in the Amazon. Menezes & Silva provide an analysis of the socio-biodiversity dynamics of the Caatinga in the Sergipe backlands, and Coelho-de-Souza *et al.*, in the context of Rio Grande do Sul, discuss ecological restoration as a strategy to achieve water, energy, food, and socio-environmental security in the face of climate emergencies. Finally, Cunha investigates how institutions reshape access to natural resources and markets for Quilombola communities in the Rio Trombetas Biological Reserve (PA).

In the *Varia* section, Nascimento *et al.* explore the synergies between water management and tourism by analysing the relationships between the Sustainable Development Goals. Batista & Dias examine the relationship between the Water Footprint and the sustainability of menus developed by the university restaurant of one of the campuses of the Federal Institute of Piauí, and Souza *et al.* conclude by presenting the development of a sugarcane bagasse composite for application in the creation of eco-friendly jewellery. To end this issue, Drummond, in his Opinion article, offers a critique of the concept of sustainable development, highlighting logical, ethical, and scientific inconsistencies in addressing socio-environmental issues.

We would also like to highlight that a call for papers for a *Dossier* on the recent climate disaster in Southern Brazil will soon be announced on the SiD website, to be edited by Diego Pereira Lindoso (CDS/UnB) and Alexandre Strapasson (CDS/UnB).

We hope you enjoy the reading of this issue.

NOTES

1 | [https://climainfo.org.br/2024/05/21/tragedia-no-rs-socorro-ao-estado-pode-custar-r-118-bi-ao-governo-federal/\(08/05/2024\)](https://climainfo.org.br/2024/05/21/tragedia-no-rs-socorro-ao-estado-pode-custar-r-118-bi-ao-governo-federal/(08/05/2024)).

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