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Does climate change cause disasters? How citizens, academics, and leaders explain climate-related risk and disasters in Latin America and the Caribbean

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ABSTRACT

For decades, social scientists have attempted to reveal the real causes behind disasters. While some scholars have recently focused almost exclusively on people's vulnerabilities, the majority recognize that disasters result from a combination of people's choices and hazards. Agencies and government officials, on the other hand, have often downplayed the political component of disasters (particularly those linked to global warming), preferring to focus on the technical and managerial aspects of climate response. This study explores how activists in informal settlements, academics, and governments in the Global South explain climate-related risk and disasters. The study is based on interviews, workshops, and group meetings in Haiti, Cuba, Chile, and Colombia, and on a four-year analysis of implementation activities where community leaders were given financial resources to create risk reduction initiatives. Results show that there are significant mismatches between understandings of climate effects by people in informal settlements and decision-makers. Besides, whereas some scholars tend to focus on an anthropocentric view of risk and consider climate a component of "the hazard," residents perceive it as a factor of their vulnerability and a threat to their territories and ecosystems. These results challenge some popular definitions of climate risk and suggest that modern epistemologies of disasters are inappropriate to set up effective risk reduction in the Global South. Understanding local narratives of risk is crucial for the integration of climate and social agendas in the region.

1. Introduction – how do we explain climate-related risk and disasters?

Explanations of risks and disasters that are directly or indirectly related to global warming effects (hereinafter "climate-related risk and disasters" or CRRD) are highly contentious among academics and the general public. Several factors affect our perceptions and reactions to climate effects, including religion [1], livelihoods [2], exposure to

hazards [3], and economic and cultural conditions [4,5]. The way we "frame" explanations of CRRD influence the way we respond to them [6, 7]. Several authors have argued, for instance, that positivist and deterministic explanations of disasters that focus on natural hazards make it difficult to identify responsibilities for risk creation and to guarantee the accountability of those in power. They contend that a focus on climate adaptation, for instance, distracts us from the radical changes needed to reduce socio-political vulnerabilities [8]. This approach "perpetuates an

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anti-politics machine, obscuring and depoliticizing rather than addressing the political dimensions of the adaptation problem" [9]; p. 1). Critics deplore that adaptation and some approaches to climate resilience fail to deal with the root causes of disasters: marginalization, exclusion, colonialism, inequality, racism, and other social injustices.

This study analyses explanations of CRRD in Latin America and the Caribbean (LAC). We seek to investigate how people living in conditions of informality, government, and scholars explain and act upon the connections between risk, disasters and climate change. In the following section, we explain some basic definitions and explore relevant epistemological approaches to risk and disasters. We then develop two models that allow us to study narratives and disaster risk reduction (DRR) action in select locations. In section two, we unpack the methods used to explore narratives and conduct action research. In the results section, we demonstrate how different (and sometimes contradictory) explanations of CRRD created tensions. Lastly, we conclude that global warming does cause disasters in LAC—just not the types of events some disaster scholars first consider.

1.1. The role of hazards and vulnerability in risk and disasters

In the 1980s, social scientists found that most scholars and decision-makers interested in disasters focused on the natural events themselves (their characteristics, frequency, and intensity), and technical ways of dealing with them. They noticed a lack of interest in, and understanding of, the socio-political and economic conditions that lead to destruction. [10]; p. 6) argued that "in the dominant view [of the 1980s] disaster itself is attributed to nature." He claimed that a politically-engaged perspective from social sciences was needed to challenge positivist and deterministic views. Years later, Blaikie et al. [11], followed this path and challenged the "naturalness" of disasters [12] through the Pressure and Release (PAR) model. In this model, disasters are conceptualized as rare (or, at least, non-continuous) extreme events that affect people as the result of a collision between a natural hazard and unsafe conditions, the latter caused by social injustices rooted in historic conditions [13].

In the 1990s, social scientists in LAC—many of them members of a network called *La Red*—followed this trend [14]; A [15,16]. They argued that politically-engaged "framings" were also required in the region [17], and similarly understood disasters as consequences of social injustices [18,19]; A [15,16]. Some saw disasters as the result of insufficient social development [20,21]—an argument that was challenged by authors who claimed that some forms of development cause disasters [9,22]. Others, instead, focused on the impact of colonialism and imperialism on the reproduction of a reductive form of development based on extractivism [23]. Finally, other approaches adopted a neo-Marxist perspective that situates economic systems as the root cause of vulnerability [20]; B. [24], and disasters as "deeply embedded within the social structures" that produce inequalities [25]; p. 9).

In a region plagued with poverty and segregation, an emphasis on vulnerabilities understandably took hold. Scholars noticed, for instance, that after the 1976 earthquake in Guatemala, people living in informal settlements were disproportionately affected. They called it a "class quake" [26]. Likewise, scholars observed that indigenous communities are recurrent disaster victims [27,28] and that their knowledge of the territory has been lost in colonial and post-colonial forms of development [29].

This vulnerability approach never became a homogenous theory, but a way of thinking that still encompasses various interpretations of people's fragilities [30]. Despite some differences, most scholars now agree that risk—that is, "the possibility of adverse effects in the future" [31]; p. 69)—is the result of exposure to hazards and vulnerability: $R = E \times V$. Of course, risk and disasters are not the same: disasters are often conceptualized as risks that materialize in overwhelming impacts [32]. Vulnerability and exposure are not the same either: exposure is a common variable of vulnerability but "it is possible to be exposed but not

vulnerable." Regardless of these distinctions, most social scientists contend—in what seems to be for some a rapid shortcut—that disasters are also caused by the interplay between hazards and vulnerabilities: $D = H \times V$ [11,30,33]. As we shall see, these two equations are becoming problematic or at least controversial when climate change is at play.

"Climate change does not cause disasters," said Ilan Kelman on the popular podcast *Disasters Deconstructed*. "Weather and climate don't cause disasters—vulnerability does," he explained in print and, pointing to the example of Hurricane Harvey, added: "Climate change does not affect people's vulnerabilities to the hurricane," only people's choices do [34]. Kelman's argument represents a recent trend in disaster studies that focuses almost exclusively on vulnerabilities to explain disasters. From this viewpoint, climate change is a "scapegoat for many global ills" [35]; p. 32) that is used to avoid serious action against the creation and tolerance of vulnerabilities. Kelman and other scholars have minimized the hazard component, seeing disasters almost exclusively as the result of peoples' "choices" in the creation of vulnerability. They claim that climate change can be conceptualized and dealt with using classic DRR concepts, such as vulnerability reduction and attempts to reach social justice [36,37].

Even though this approach is not mainstream theory, it does lead to several pertinent questions: How important is the "hazard" component of disasters in the case of climate change? Is it true that climate change does not significantly affect people's vulnerabilities? What are the consequences of understanding vulnerabilities exclusively as social constructs, without elucidating the role of climate change?

1.2. The problems of a vulnerability approach in the face of CRRD

Clearly, positivist and deterministic explanations of disasters are inadequate as a foundation for risk reduction. But some scholars argue that there might also be problems linked to an emphasis on vulnerabilities (some were addressed in the 2nd edition of *At Risk*, while others have only become relevant more recently, as climate effects are better understood). Here, we summarize five of them:

1. *Climate change as a cause of vulnerability*: It is often believed that disasters reduce the possibility of achieving appropriate levels of societal development [38]. Surprisingly, however, the relationship between global warming and people's vulnerability is still a matter of debate. Schipper and Pelling [39]; p. 26) posit that climate change slows down development objectives: "just as disasters are understood to turn back the development clock through loss of infrastructure, livelihoods, and psychological stress, climate change is frequently cited as one of the most serious environmental problems confronting human development." This doesn't mean that climate change is a disaster in itself, nor does it mean that economic systems should remain untouched: "the potential increases in extreme events due to climate change come on top of alarming rises in vulnerability" [40]; p. 5). What it does mean is that climate change increases people's vulnerability and must be seen as "a complex and protracted hazard," which is "weakening the resilience of livelihood systems." [41]; p. 68).
2. *Responsibility and agency*: Recognizing the root causes of vulnerability underlying disasters is a crucial intellectual endeavour, but one that may not translate easily into effective DRR action. Ordinary Haitians or Cubans recognize trade policy and geopolitics, as dictated by neoliberal American politicians, as causes of poverty in their countries [42,43]. At the same time, however, their influence in transnational politics is likely negligible, which does not set them on a path to reduce their risk. In fact, this recognition of the role of "other" societies in disaster risk creation can translate into a feeling of impotence and dependence.

To be clear, the difficulty of moving from recognition of *root causes* of vulnerability to *agency* around risk reduction also applies to climate-related hazards. For example, there is little that

climate-affected small islands can do to reduce pollution caused by the lifestyle of Americans or Europeans. But a difference emerges between risks related to climate change and risks that are not: While it is illogical to blame society for the eruption of a volcano, it is fair to blame polluters for creating global warming. Dealing with climate change involves recognizing human responsibility in the creation of the hazard. This responsibility does not apply to other hazards. Some exceptions include the role of fracking in earthquake risk, or urban lighting in disruptions of animal migrations. But these exceptions only confirm what ecologists and other scholars of the Anthropocene know well: that the human component in hazards is increasingly relevant in disaster explanations because humans are more obviously responsible for those threats. An emphasis on “hazard” components is understandable when the threat is not really natural but caused by human action.

3. *Victimization and stigmatization*: Scholars have long acknowledged that an emphasis on vulnerabilities can lead to an over-victimization of people [30]. Recent studies in LAC found that the “vulnerabilization” of risk has led development agencies to treat women as passive victims of disasters, which necessitates a new approach to address risk, predicated on people’s agency, rather than assumptions of fragility [23]. Building on feminist social theory, Brown [44]; among others, refers to “the power of vulnerability”, arguing that vulnerability can be seen as a strength. For instance, those in vulnerable positions have distinct perspectives that enable them to detect and offer solutions that those less vulnerable cannot [45]. According to von Mending and Harmon [46]; for these reasons, transformative change is only made possible by recognizing the value of vulnerability.

Besides, an emphasis on vulnerabilities contributes to stigmatization of poor countries as “fragile,” “weak,” and “impotently” determined by historical fate and transnational powers [47,48]. For Bankoff, vulnerability is often part of a Western discourse of “otherness” that Europeans have adopted while describing poor countries; “Central to the [vulnerability] perspective is the notion that history prefigures disasters, that populations are rendered powerless by particular social orders that, in turn, are often modified by the experience to make some people even more vulnerable in the future” [49]; p. 25). For him (2001, p. 19), tropicality, development, and vulnerability, “form part of one and the same essentializing and generalizing culture discourse that denigrates large regions of the world as disease-ridden, poverty-stricken and disaster-prone.” According to this viewpoint, people in the Global South would have little agency and capacity to change their own fate [25]. Besides, by stressing the role of poverty, imperialism, and colonialism, some vulnerability theorists focus heavily on what people and societies in developing countries lack, as well as their past, underestimating both their strengths and the role of local elitism, tribalism, and corruption.

4. *The role of the State*: Most accounts of vulnerability lead us to believe that disasters are the natural consequence of the clash between

vulnerabilities and hazards. But several studies have shown that disasters are not objective events that simply “happen.” Disasters are social constructs that are “declared” by decrees, states of exception, states of emergency, and other political tools [50,51]. Quite often, disasters are *constructions* of the State [52], asserted in terms that favour the political approach of those in power.

5. *Anthropocentrism*: Most vulnerability studies focus on how vulnerability impacts human beings. After a comprehensive study of several definitions adopted since the 1950s, Perry [53]; p. 12) finds that “disasters are inherently social phenomena.” But is the melting of glaciers, for instance, a “disaster” only if it affects people? Ecologists, biologists, and academics in natural sciences are seeing climate change as a significant threat to already endangered species, and fauna and flora in general, and want to expand our understanding beyond this anthropocentric focus. They are not necessarily concerned with the type of impacts that may or may not cause “human” disasters, but rather, those that affect landscapes and ecosystems in permanent ways.

To be clear, the concept of vulnerability has not always adopted a social constructivist approach. Even though most authors have centered on humans, they have surely considered the ecosystems and resources on which humans depend (see, for instance: A.J [54]. Several social scientists have refused clean-cut divisions between society and nature and between human and non-human system components. According to Ref. [55], Science and Technology Studies have “demonstrated how material agency can manifest in unexpected ways as a result of human practice [...] and how such manifestations of agency can influence cultural change as well.” But it is fair to say that many disaster scholars still focus on disasters’ impact on people or in how nature is transformed by political and economic dynamics.

Besides, the conceptualization of climate change has largely relied on conceptual assumptions and comparisons of terms determined by scholars and institutions (e.g. the IPCC panel, UN agencies, and scholarly glossaries and handbooks). Not enough has been done to validate whether, or how, these arguments align with the perspectives of people living in informal settlements in poor countries, as well as indigenous or local concepts and world views [56]. In fact, several authors have claimed that indigenous cosmovision often point to non-anthropocentric views of climate effects [57], environmental problems [58], and ethics [59].

1.3. The epistemological landscape of risk and disasters

Given the variety of approaches that exist, a continuum can be identified in disasters’ literature with respect to the emphasis given to natural hazards and vulnerability (see Table 1). This continuum is similar to the views of risk found by Blaikie et al. [11]; who argued that there is, at one extreme, the “realist approach that takes risk as an objective hazard that exists and can be measured independently of social

Table 1
Summary of the main characteristics of a disasters epistemology based on natural hazards and vulnerability.

	Emphasis on natural hazard(s) and the realist approach	Emphasis on vulnerability and the constructivist approach
What is the threat?	climate influence on floods, sea-level rise, heat waves, droughts.	Socio-political-economic system (violence, savage capitalism etc.)
What should people do?	Adapt to the threat	Change the system
Who or what is the victim of disasters?	Ecosystems and people	People
What is the influence of climate change?	Climate change is causing disasters	Climate change is simply one more variable in a world of hostility
What should policy do?	Promote adaptation ^a to “new” threats	Disrupt the status quo
Common disciplines engaged with this viewpoint	Ecology, natural sciences, engineering, architecture	Anthropology, sociology, human ecology, political ecology, human geography
Approach	Focused on ecosystems	Anthropocentric view
Common criticism	Too positivist and deterministic. Based on technocratic solutions	Naive and based on wishful thinking about politics. Insufficient emphasis on nature

^a Of course, different conceptualizations of “adaptation” coexist.

Table 2
Activities conducted for the six case studies.

	Visits by local team (by int. team)	Workshops	Interviews with residents (with officers)	Focus groups	Micro- projects documented	Hours of interviews	Meetings with community leaders
Concepción, Chile	4 (0)	2	5 (5)	4	9	9	6
Carahatas, Cuba	8 (2)	3	10 (10)	4	4	10	6
Canaan, Haiti	4 (6)	2	12 (2)	3	0	12	7
Yumbo, Colombia	7 (3)	4	6 (3)	4	9	11	10
Salgar, Colombia	3 (1)	1	10 (2)	1	2	9	2
San Andrés, Colombia	3 (0)	1	8 (3)	1	0	7	2

and cultural processes,” and, at the other extreme, the “constructionist approach, where nothing is a risk in itself but is a contingent product of historically, socially, and politically created ‘ways of seeing.’”

There have been, of course, several attempts to avoid these extremes and to refuse the divide between society and nature, and natural and human-made systems. Some efforts in the disaster field, including the work by Roberto Barrios [60] have refused modernist epistemologies of disasters. Barrios builds on Bruno Latour’s attempts to “de-anthropocentrize” epistemology and explore the proliferation of “hybrids.” In “We Have Never Been Modern,” Latour [61] wonders: “Can anyone imagine a study that would treat the ozone hole as simultaneously naturalised, sociologised, and deconstructed?” In asking this question, Latour invites us to imagine an approach that would understand threats as complex networks where humans and non-human systems constantly interact. Similarly, efforts by Barrios and other scholars in human ecology contend that disasters “challenge a neat separation between nature and culture” [60]; p. 24).

Borie et al. [62] propose a mapping of urban resilience narratives based on conceptual continuums. A first model employs two axes, the continuums between: (a) security and social justice, and (b) modernization and environment. A second model maps resilience narratives around action, with continuums along one axis from (a) conservative to transformative, and, along the second axis (b) top-down to bottom-up.

We also adopted two models to examine empirical evidence and mapping of the CRRD narratives. The first one (Fig. 1) helps us map responsibility for climate action, whereas the second one (Fig. 2) helps us situate notions of protection. Much like Borie et al., we give particular importance to governance, and place in Fig. 1 the continuum from natural hazards to vulnerability on the horizontal axis, and the

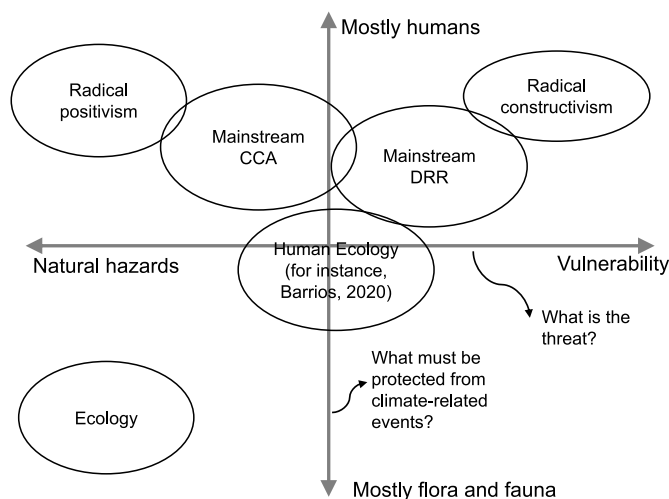


Fig. 2. Framework used to analyze literature and empirical evidence.

continuum between government or citizen responsibility for climate change action in the vertical one (government here comprises mainly local municipalities and national DRR institutions and their policy).

Fig. 2 also has two axes, but the first one represents the eco-centric to anthropocentric focus and the second the natural to social causes of disasters. Fig. 2 shows how six approaches found in the literature, namely radical positivism, mainstreamed climate change action, mainstreamed DRR, human ecology, ecology, and radical constructivism, might be situated in the quadrants. These are not, of course, mathematical mappings of data, but conceptual or heuristic devices to understand the literature and empirical data. For example, we situate the argument that “disasters are caused by vulnerabilities which are entirely societal processes” [63]; p. 2 at the top-right of the diagram. In the center of the diagram we could situate the argument that “analyses that explain disasters as effects of a root cause that lies strictly in the objective material (i.e., where disaster is reduced to a natural hazard) or in the sociocultural worlds (i.e. social constructivist approaches) are flawed because they miss the inseparability of things like meaning and matter, society and environment, and politics and scientific knowledge” [60]; p. 24).

2. Methods – comparative cases in LAC

How do people living in informal settings in LAC explain CRRD? Please note that we prefer the term informal settings to “informal settlements” to include informal livelihoods and practices. In order to answer this question, we set up a multidisciplinary group of seven universities in Haiti, Cuba, Chile, and Colombia, and one NGO with

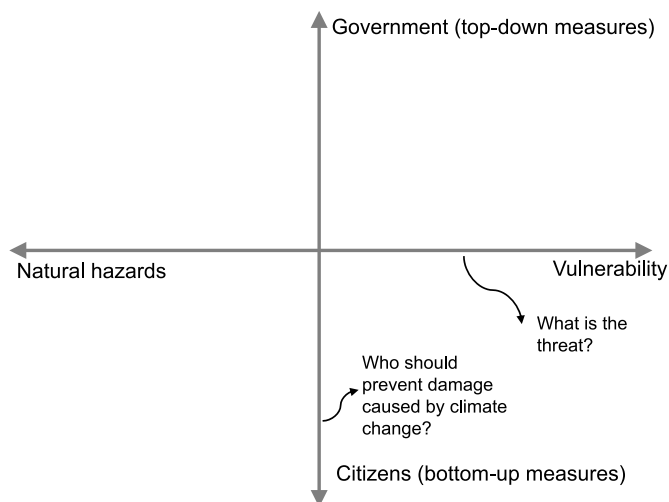


Fig. 1. Framework used to understand perceptions of climate change.

activities in the region. Our team included 17 academics and 2 DRR practitioners (10 architects, 2 urban planners, 1 geographer, 2 engineers, 1 industrial designer, and 3 social workers).

The project was conducted from 2017 to 2020. Local researchers communicated with local respondents in Spanish and Haitian Créole. For the most part, teams communicated in Spanish and then translated terms and ideas into English and French. The case studies were subject to Ethics Committee reviews in five local universities and one Canadian university. We then aimed to develop “textual constructions of reality” [64] in six locations known to face several climate effects, notably in relation to water, in particular: floods, sea-level rise, droughts, water surges, tropical storms, hurricanes, and landslides. These cases provided an opportunity to explore narratives within different governance structures and political contexts. At the same time, they provided a basic context of informality and bottom-up agency to examine how narratives are taken to action. Below basic information about these locations and references to find more information about them:

- Canaan, Haiti: an informal settlement in the north of Port-au-Prince, created after the 2010 earthquake [65];
- Carahatas, Cuba, a fisherfolk community in the northern littoral located in an area mapped as flood prone [66];
- Concepción, Chile, a medium-size city located in the coast in the central part of the country [67];
- Yumbo, Colombia, an industrial city located North of Cali [68];
- San Andrés archipelago, a group of small Colombian islands located in the Caribbean, close to Nicaragua [69];
- Salgar, Colombia, a city in the mountains of the Antioquia region [70,71].

We adopted three empirical approaches and combined qualitative data to obtain analytical generalisations [72]:

- Ethnography:** We analysed responses to risk in six locations, paying particular attention to their own complex socio-political contexts (A [15,16]. Adopting Hammersley’s [73] view of ethnography, we engaged in *doing* ethnography and *using* ethnographic tools. The idea was to achieve “explicit interpretation of the meanings and functions of human actions” [74]; p. 248). To accomplish this, local teams spent significant time in place, where they interviewed a total of 51 community members and social leaders, as well as 25 government officers (see Table 2).

We also conducted at least one semi-structured focus group with

about ten locals in each location, prioritizing those citizens who are often less heard, notably women, elders, and residents with reduced mobility. In five of the six locations, we conducted an on-site workshop with local and international students in architecture, urban planning, and engineering. During these workshops, local and foreign researchers and students spent several hours in discussion with local leaders and citizens, and also visited residents’ homes and collective buildings, such as schools and community centers.

Over the four years of the project, local teams visited each site several times. We captured changes in the territory and settlements through hundreds of sketches, photographs, and plans. Researchers observed social dynamics and the environment, which revealed patterns centered on daily activities and religious rituals. At least one researcher stayed in each location for one month or longer, recording nighttime activities and entrenched practices and rituals, such as collective cooking, fishing, and gardening. Embedded research was conducted before and after natural hazards, which allowed us to understand their direct impact and document the measures taken to mitigate them (see Table 3).

Through this ethnographic work, we were able to contextualise local explanations of risk and disasters in conjunction to people’s social struggles. But we did not only want to know how people in informal settlements *perceive* risk; we sought to discover how they effectively *act* in response to it (how people and actions interact in a given context). We therefore set up a program of micro-projects.

- Action Research:** In four locations (Yumbo, Salgar, Carahatas, and Concepción) local teams identified bottom-up DRR initiatives led by local leaders in response to CRRD. The teams submitted these initiatives to an international committee that validated their pertinence as a local climate response and compliance with ethical standards. Each initiative received 3200\$ USD in funding. In micro-projects type A, social leaders partnered with the local university to plan, design, and execute them. This partnership reinforced the initiatives and further legitimized the work of local leaders. But we also noticed that these partnerships could also bias our research results. We therefore decided to fund other cases (type B), in which local universities acted as passive observers of the micro-projects. We used 15 type A and 9 type B micro-projects as entry points to local cosmovision of climate risk and followed their activities for a period of about three years, documenting how activities were prioritised, resources invested, governance mechanisms established, and activities conducted.

Table 3
Risks and disasters in each location.

	Main recent disasters	Main water-related hazards	Main human-made threats to ecosystems	Other common threats commonly attributed to “the environment”	Other common threats, commonly attributed to “society”	Number of residents in the location
Concepción, Chile	Earthquake and tsunami, 2015	Tsunamis, floods	Pollution (water, soil, air), deforestation	Covid-19	Food insecurity, crime	About 20,000
Carahatas, Cuba	Hurricane Irma, 2017	Sea-level rise, hurricanes, tropical storms, droughts,	Deforestation	Dengue, chikungunya, Covid-19	Food insecurity	About 600
Canaan, Haiti	Earthquake, 2010	Floods, water surges, landslides, droughts, hurricanes	Pollution (water, soil, air), deforestation, intensive mining, intensive urbanisation, unsafe construction	Lack of potable water, malaria, dengue, chikungunya, Covid-19, Cholera, Zika	Food and tenure insecurity, fires, crime, violence, unemployment	About 300,000
Yumbo, Colombia	Floods, 2011, 2017	Floods, water surges, landslides, droughts	Pollution (water, soil, air), deforestation, intensive mining, intensive urbanisation	Wildfires, malaria, dengue, chikungunya, Covid-19	Food insecurity, crime, violence, unemployment, inequality	About 10,000
Salgar, Colombia	Landslide, 2015	Floods, water surges, landslides, droughts	Pollution (water, soil), deforestation, intensive agriculture, construction on riverbanks	Erosion, Covid-19	Crime, violence, unemployment, inequality	About 18,000
San Andrés Archipelago, Colombia	Drought, 2016, Hurricane Iota, 2020	Sea-level rise, droughts, hurricanes	Pollution (soil and underground water), deforestation, intensive urbanisation	Lack of potable water, malaria, dengue, chikungunya, Covid-19	Food and water insecurity, unemployment, inequality	About 70,000

3. Core stories: Local teams in each location worked with an overseas team of researchers to conduct critical discourse analysis [75]. People's stories [76] were seen here as "ideological work," entrenched in history and social values. Our aim was not to judge the legitimacy of claims but to understand the tensions they create. We saw the stories as tools that reveal: (a) local perceptions of risk and social change [77]; (b) how people want to improve their living conditions [78]; (c) governance structures and means of participation in public debate [79]; and (d) and informal settlers' claims [80]. For each case study, we reviewed more than 20 press releases, official documents about DRR, and climate change reports. Through discourse analysis, we explored meanings, representations, and values as expressed in Latin American Spanish and Haitian Créole.

During the implementation of the micro-projects, social movements erupted in Colombia, Chile, and Haiti. The movements brought together a variety of claims and sentiments against discrimination, corruption, neoliberalism, and racism. But the movements also highlighted importance of environmental degradation and climate action. We realized that the movements' claims could affect the narratives we were obtaining in informal settings, and therefore, decided to analyze them too. We distilled local explanations of risk [81] and compared them to the representations proposed by social leaders, decision makers, and academics [82].

Second-hand data (both quantitative and qualitative) was used to complement and validate information collected through empirical work. We conducted word counts in several documents from each location to identify the recurrence of certain terms (seen as categories of analysis) such as: resilience, adaptation, adaptive capacity/ies, defense, security, social change, vulnerability, poverty, exclusion, marginalization, and protection. Transcripts of interviews, meetings, and focus groups were analysed through subject categories in local Spanish, Créole, or French first, followed by English later. We paid attention to the particular connotations of DRR language in each location and the translation of terms. It was crucial that local terms, but also hidden messages and values, were understood by all. We thus spent significant time to ensure that all members of the international team understood the deeper meanings of local practices, rituals, and values.

Data were analysed independently by the local and international multidisciplinary groups of researchers. Local teams independently identified categories used in these core stories, and the categories were then compared. In one of the final steps, we moved, or exchanged researchers between locations. Ten graduate students worked in a foreign location, exchanging data and information between groups. We also organised four meetings of researchers to facilitate data exchange and analysis. Four local leaders from Colombia, Chile, and Cuba participated in one of the international meetings to help review and validate early results. Finally, we conducted several hours of WhatsApp conversations and Zoom meetings with local leaders and researchers to validate terms, adjust arguments, and find nuances. We eventually brought all the results together and compared them with previous studies to identify patterns [83]. This paper reports the final conclusions of this four-year project.

3. Results – narratives of disaster risk creation

In all locations, residents who were given the possibility to invest resources in initiatives responding to climate effects hardly thought about developing solutions to directly protect themselves from natural hazards (see Table 3). Only a few leaders focused on building housing or urban projects. Instead, most initiatives focused on protecting the environment. Leaders were interested in protecting the local river or forest, planting trees, reforesting the area, growing edible plants, and saving green areas from residential development.

Table 4 shows the main risks that micro-projects attempted to tackle

and the type of social responses that were adopted. An emphasis on ecosystems is apparent. Only one type A project and one type B project adopted a purely anthropocentric approach. Instead, 13 micro-projects adopted a decisively environmental perspective, and 10 projects combined a mixed approach.

After data triangulation, we were able to situate the narratives within the models we developed. Fig. 3 graphically represents where each micro-project is located within our framework. It shows that most projects sit in a human ecology space, giving importance to a proper balance between how climate change affects humans and ecosystems.

Local leaders in charge of these micro-projects associated CRRD with events that, in their words, "break the harmony between people and the natural environment." They rarely associated climate change with material losses or the destruction of their homes and infrastructure. Instead, their responses to climate threats showed an interest in four objectives; (a) minimizing daily risks such as food insecurity, and unemployment (all locations) and, in Colombia, crime and violence; (b) protecting livelihoods, such as fishing, agriculture, and retail; (c) assuring continuity in their locations (preventing relocation); and (d), and establishing stronger connections with nature through gardening, tree planting, agriculture, water and forest stewardship, and expanded knowledge of local flora. To achieve these four objectives, they created micro-projects that drew on their own knowledge and skills: urban agriculture, education, and training (all locations), pottery (in Chile), and soccer and physical activities (in Yumbo). In 13 cases, they targeted activities for children and youth. They explained that climate response is a long-term process that requires action by the next generation. "If children are made aware of the damage we are doing to our planet, they will act differently," said a woman in Carahatas. Similar comments were found in other locations.

We found three prevailing CRRD narratives in Colombia, Chile, and Cuba, and four in Haiti. They are represented in Figs. 3 - 6 and detailed below.

3.1. The Colombian narratives

Dominant narratives in Colombia varied by group of respondents: government officials voiced hazard management narratives; social movements voiced a strong concern with addressing corruption and poor governance; and local residents voiced narratives linked to inequality and environmental injustice (see Fig. 4).

The resist the hazard approach: Recent climate-related policy documents in Colombia have embraced a disaster resilience and sustainability narrative [84]. Most government approaches in Yumbo, the San Andrés archipelago, and Salgar recognize that global warming effects are exacerbating meteorological hazards, so authorities focus on providing infrastructure capable of dealing with them. In Yumbo, the approach is often to pave roads and provide sewage and water systems. In San Andrés, the main government response has been to build an aqueduct [85], whereas common responses in Salgar include retention walls and roads [70,71]. But authorities also expect businesses and citizens to take action to prevent damages. Authorities in Salgar and Yumbo, for instance, view illegal occupation of river shores as a cause of vulnerability to water-related disasters. In their resilience narrative, government is responsible for building infrastructure that can resist climate hazards while residents are expected to gain awareness of climate threats and adapt.

The anticorruption perspective: Citizens often consider climate change a barrier to development that increases people's vulnerability due to its impact on public health, an idea that has been captured by both NGOs [86] and scholars [87] "If no adaptation measures are taken, 80% of crops would be impacted in more than 60% of their current areas of cultivation, with particularly severe impacts in high-value perennial and exportable crops" [88]; p. 611). Spokespeople of the 2019 social movement depicted environmental degradation as a major issue for people's well-being. Climate change is viewed as tangible proof and a

Table 4

Summary of micro-projects in the four locations targeted for implementation, including type of risk, type of response, and prevailing view of the disaster.

Micro-projet number and name	Location	Type	Type of risk							Type of response					View of disaster			
			Flood rise	Sea-level rise	Landslides	Droughts	Pollution Air/Soil/Water	Food insecurity	Deforestation	Crime and violence	Urban agriculture	Sports and recreational activities	Art and cultural events	Education and training activities	Infrastructure/urban	Anthropocentric disaster	Anthrop. and environ. disaster	Environmental disaster
1 Vertical Community Garden	Concepción, Chile	A						●		●	●			●			●	●
2 Pottery Workshop	Concepción, Chile	A	●					~				●	●				●	
3 Natural Mitigation and Irrigation Barrier	Concepción, Chile	B			●												●	●
4 Sustainable Urban Drainage System	Yumbo, Colombia	A	●		●				●		●			●			●	●
5 Water Management System	Yumbo, Colombia	A	●		●				●		●			●			●	●
6 Community Gardens	Yumbo, Colombia	A					●	●		●			●				●	●
7 Reforesting Yumbo	Yumbo, Colombia	A			●	●			●				●					●
8 Resilient Housing	Carahatas, Cuba	A		●										●		●		
9 Community Group <i>Mujeres del Mar</i>	Carahatas, Cuba	A		●								●	●	●				●
10 Circle of interest <i>Yo me adapto</i>	Carahatas, Cuba	A		●					●			●	●					●
11 Botanical Illustration	Concepción, Chile	B							●			●	●					●
12 Classrooms Natural Environments	Concepción, Chile	B				●			●			●	●					●
13 Forest Therapy	Concepción, Chile	B							●			●	●					●
14 Plaza Nonguen	Concepción, Chile	A/B							●			●	●	●			●	●
15 Estuary Dome	Concepción, Chile	B						~	●	●		~	~	●				●
16 Recovering water	Concepción, Chile	B	●		●	●			●		~		~	●				●
17 Family Garden	Yumbo, Colombia	B					●			●							●	●
18 Creek Reforesting	Yumbo, Colombia	B			●				●				●	●				●
19 Coastal Festival	Carahatas, Cuba	A		●								●	●					●
20 Ecosystem Adaptation	Salgar, Colombia	B			●				●			●	●					●
21 Managing the Risk	Salgar, Colombia	B				●			●			●	●		●		●	●
22 Urban Edge (II)		A	●		●				●		●			●			●	●

(continued on next page)

Table 4 (continued)

Micro-project number and name	Location	Type of risk		Type of response						View of disaster							
		Flood	Sea-level rise	Landslides	Droughts	Pollution Air/Soil/Water	Food insecurity	Deforestation	Crime and violence	Urban agriculture	Sports and recreational activities	Art and cultural events	Education and training activities	Infrastructure/urban disaster	Anthropogenic and environ. disaster	Environmental disaster	
23 Family Garden (II)	Yumbo, Colombia						●									●	
24 Creek Reforesting (II)	Yumbo, Colombia			●										●			●

symbol of this environmental degradation. In this regard, climate change is often associated with the rampant deforestation going on in the country, uncontrolled urbanization, and high levels of water, air, and soil pollution. Other major threats are changes in El Niño and La Niña, and the melting of glaciers—changes that are associated with water surges and major landslides. After recent major floods/landslides in Salgar and Yumbo (but also Mocoa and other riverside municipalities), people now associate disasters with environmental degradation and climate effects. They recognize that corruption hinders the possibility of creating healthier relationships between citizens and the environment. Thus, a common narrative in the social movement is that political change is required to reduce damages to the planet.

The environmental inequality perspective: Residents living in informal settings are more concerned with daily struggles, such as unemployment, violence, crime, and food insecurity, than climate change effects. Many of them argue that climate effects tend to happen only in rich nations. They are, however, concerned with local environmental problems. “Nature has a good memory. People don’t, and we will pay the price,” says one local leader in Salgar. In Yumbo, air pollution, waste, deforestation and intense mining are of environmental concern, but so is the disparity between the wealth generated by extractive industries and its local distribution; according to a local leader in Yumbo, “it is unfair that we live in poor conditions close to such important industries that are located here. We have been forgotten for many years.” In Salgar, residents are concerned with water pollution, loss of indigenous vegetation, and housing construction along the riverfront. In the San Andrés archipelago (including the island of Providencia), a common concern is lack of potable water; local residents attribute depletion of water wells to the arrival of new settlers (who are seen as outsiders) [85].

In all cases, residents argue that these environmental threats reveal social inequality and unhealthy relationships between humans and nature. They contend that more affluent neighbourhoods and privileged citizens benefit from better environmental conditions. Environmental equality is a constant social struggle: “We have never had access to water or received anything without a struggle,” says one resident in Yumbo. Colombian scholars have recently adopted this form of environmental and climate injustice to address DRR in informal settlements from a perspective of social change [89]. Micro-projects and local initiatives often focus on environmental action such as planting trees, urban agriculture initiatives, and environmental awareness. In this narrative, climate change becomes a manifestation of environmental inequalities that threaten daily lives. Slum dwellers see that the national government and local authorities bear a responsibility for environmental injustices and expect them to take action to redress them.

3.2. The Cuban narratives

Cuban narratives also fell into three types, two from the government—an earlier civil defense (1975–2015) and later (post-2015) protect the population approach—and one from local residents. They are depicted in Fig. 5.

The defense perspective: DRR in Cuba before 2015 was based on a local model called “Defensa Civil.” In this narrative, the State was responsible for the “protection and safety” of citizens. The narrative of defense against hazards was aligned and close to the national narrative of defense against military occupation of the island by foreign forces. In this model, risk reduction is a consequence of discipline in addressing basic social needs: minimum food security, universal and quality (free of payment) health care and education, information, communication, and law enforcement. Here the State was almost fully responsible for the most vulnerable—even for the provision of housing and basic services.

The protection approach: In the past six years, the financial situation of the country has drastically deteriorated. The financial support of Venezuela has vanished and, during the Trump administration, the US embargo became even more drastic. In response, Cuban authorities have been forced to reduce State support and rely more on citizen action. The

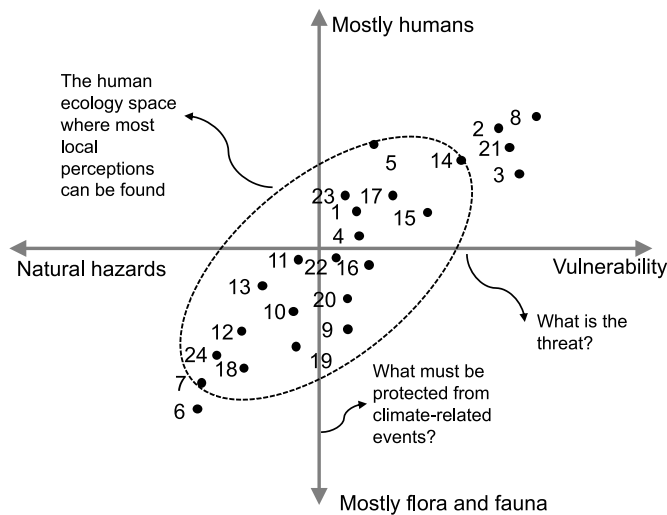


Fig. 3. Distribution of micro-projects according to the theoretical framework.

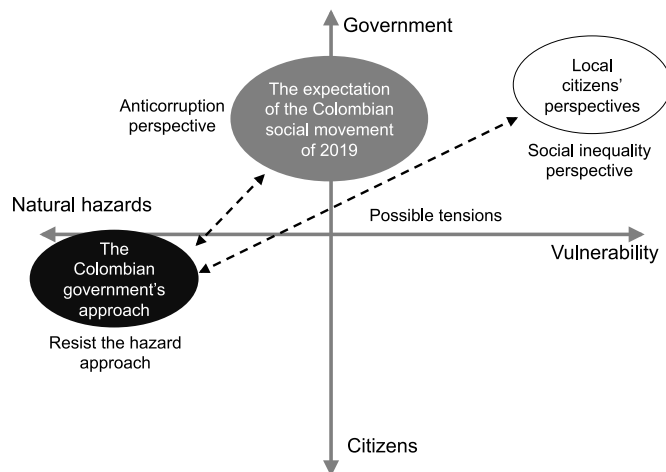


Fig. 4. Colombian narratives in Salgar, the San Andrés archipelago, and Yumbo.

government aims at guaranteeing the protection of citizens, including in the face of sea-level rise, water surges, tropical storms, and hurricanes. But dealing with climate effects is stretching government resources. So, even though subsidies in construction materials still exist, housing is now considered the responsibility of citizens. The recent legalization of private businesses in Cuba has also supported the narrative of increasing responsibility by citizens for their own welfare. To achieve protection, national authorities aim at reducing densities in flood-prone areas and encourage relocation of citizens to safe locations far from the ocean.

Cuban scholars regard climate change as a factor that increases people's vulnerability, notably through the effects of droughts on local livelihoods, as well as extra costs required to deal with climate effects [90]. Dealing with climate change in Cuba is a task given to CITMA, the Ministry of Science, Technology and the Environment. Responses to climate change often refer to impacts on ecosystems and ecological diversity. In this narrative, human action is often seen as a threat to "environmental quality" (*calidad ambiental*) [91,92]. The solution is focus on science but also to remove exposure from the equation, decoupling hazards from vulnerability (through relocation).

The continuity perspective: Citizens in Carahatas and other coastal communities such as Isabella de Sagua are resisting pressure to relocate [93]. They have strong economic and psychological attachments to the ocean and see relocation as an alternative that will increase (rather than

reduce) their vulnerabilities. In this narrative, residents emphasize the importance of continuity: residents in Carahatas claim that "if government allows us, life here is possible." Residents recognize that, for decades, they have developed construction techniques, social practices, and rituals to live in harmony with the ocean. But global warming effects are stretching the effectiveness of such solutions. They can discern the ways in which climate is challenging their coping mechanisms, increasing their vulnerability to hazards that did not formerly represent a major threat.

3.3. The Haitian narratives

Narratives evident in Canaan, Haiti revolve around the role of the State with a common recognition that the State does not address vulnerabilities, risks, and negative consequences in any significant manner. Narratives vary in how they depict that lack of States engagement: local residents highlight two parallel narratives—of an absent, neglectful State and a self-reliant 'we can do-it-ourselves' populace; the government articulates a narrative of 'laissez-faire' development in which other actors can address social and environmental challenges; and social movements advance a critical perspective that draws on theories of 'failed' or 'locked' States (see Fig. 6).

The absent State perspective: After the 2010 earthquake that devastated Port-au-Prince, thousands of residents moved to Canaan, creating a new city in a place that was previously empty [94]. Canaanites feel that the State has been largely absent from their lives and see their own vulnerabilities as intrinsically linked to State negligence, social marginalization, and exclusion [50,76]. Even though residents rarely talk about climatic change, they are concerned with erosion, deforestation, extreme heat, and floods, and associate both environmental and socio-economic problems with the lack of presence of the State.

The do-it-yourself perspective: Given the lack of interventions by the State in Canaan, residents have adopted a do-it-yourself response. Residents have reforested part of the territory, and have planned for the construction of roads, parks, and public space in the settlement [94]. Local businesses have assumed the provision of water and transportation. Residents deplore social and environmental problems and—even though they perceive the State as being particularly fragile—have expectations about the government solving them [95]. But they are also pragmatic and recognize that they must solve most challenges by themselves [96].

The laissez-faire approach: A State narrative is apparent more in action than in words: government capacity is limited and, as such, citizens, international organizations, and foreign funds will be key to addressing social and environmental issues [97]. After the 2010 disaster, the

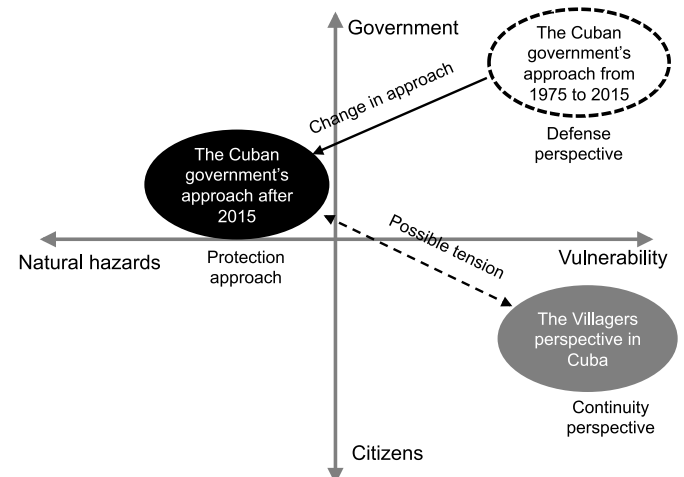


Fig. 5. The Cuban narratives in Carahatas.

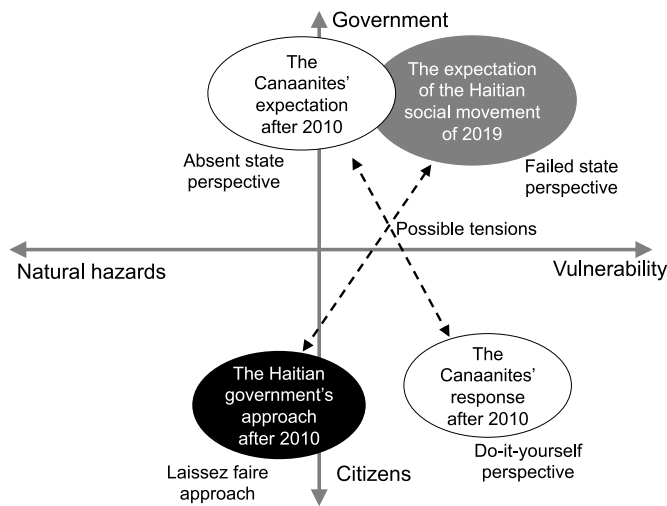


Fig. 6. The Haitian narratives in Canaan.

Haitian government tolerated the occupation of Canaan [98]. Many Haitians even believe that the government encouraged the occupation of the territory by declaring the area to be of public use. Since then, the government has done very little to improve its living conditions. It has relied on the urban planning and management action of NGOs, international consultants such as UN-Habitat, and humanitarian organizations [99]. The State recognizes both social vulnerabilities and environmental challenges however it treats climate change as a threat that drains public finances. The *laissez-faire* narrative of the government is the flipside of the do-it-ourselves narrative of Canaanites.

The failed State perspective: Social movements, academics and some politicians in the country advance a narrative that depicts the State as ineffective and broken rather than merely absent. In 2019, strikes and violence during the social movement led to a generalized paralysis in the country [100]. For many, the political system is severely compromised, the Haitian State “locked” (*peyi lòk*) and inoperative [101], and a “re-founding” of it necessary to save the country from total chaos [102]. The current situation results in corruption, unemployment, and lack of opportunities [103]. Environmental problems are seen as the consequence of insufficient planning by authorities and insufficient enforcement of law [95]. For many citizens, they are the consequence of patriarchal structures [104] and “anarchic” forms of urban development [105] that manifest the failure of the State. This narrative focuses on “renewal rather than recovery” [106]; p. 44). But when digging deeper into issues of responsibility, our respondents in Haiti admitted that they are often troubled by the distribution of blame for risk creation and question how much can be attributed to local corruption and socio-political dynamics versus colonial crimes, American politics, or pollution in industrialized nations.

3.4. The Chilean narratives

The three narratives apparent in our research in Concepción reflect three distinct stakeholder perspectives on CRRD, that of the government, local citizenry, and the social movements active in 2019–20 (see Fig. 7).

The neoliberal approach: The Sebastián Piñera right-wing administrations of 2010–2014 and 2018–now have adopted a neoliberal approach to risk. In the Piñera governmental narrative, businesses and citizens must deal with natural events. Climate effects and responses to them drain State resources and distract markets from economic growth [107]. Here, the State plays a reduced role in the face of risks—which are mostly seen in terms of natural hazards that can be overcome by facilitating new market arrangements and controlling dissent through police action [51]; not in terms of social vulnerabilities [108].

The resistance perspective: Citizens in informal settlements in Concepción adopt a narrative of social marginalization and neglect. Local leaders see neoliberalism, and the savage capitalism promoted by the government, as a cause of problems in informal settlements. They claim the importance of resisting environmental disparities and injustices. They are concerned with CRRD and the ways in which they make them more vulnerable to other threats, exacerbating the fragilities they already face. This view has been captured by local academics who see that “climate change will worsen the high levels of urban vulnerability” [29]; p. 1). Specifically, residents point to deforestation, pollution, uncontrolled urbanization, and the destruction of ecosystems through industrial and mining activities as factors that put them at higher risk and that decrease the possibilities of coping with other hazards. Even though local leaders and most residents know their territory very well, climate change is altering it rapidly. Thus, they perceive climate effects as a factor that diminishes their capacity to both understand their land and react to hazards. They want to resist the policies and structures that perpetuate these problems.

The social revolution perspective: The 2019 movement claims the need for a new social and environmental contract. Citizens claim that trust in institutions has been lost and a new social contract must not be based on capitalism and profit, but rather, on civic values such as liberty, equality, and fraternity [109,110]. The narrative is one of expanded rights and justice: a reduction in inequalities and increased freedom of religion, sexual orientation, and beliefs that correspond to increased solidarity and compassion, particularly for the poor and historically marginalized [111]. The movement perceives climate effects as a consequence of greed by economic elites and a form of development based on the overexploitation of resources. But it also observes the threat that climate change poses to environmental justice, as a factor that can obstruct access to resources—especially for the most vulnerable.

4. Discussion – tensions between narratives

Our results reveal that there are significant differences in the way CRRD are explained by government and citizens living in conditions of informality in LAC. Table 5 offers an overview of these differences among authorities and residents. The differences found here reveal both tensions in scholarship and in DRR practice.

4.1. Tensions in scholarship

The anthropocentrism problem: Writing about the theorization of climate change, some authors have claimed that humanity is facing a “Great Derangement”—that is, “a dualistic conceptualization of the world in which social and environmental processes are conceived as

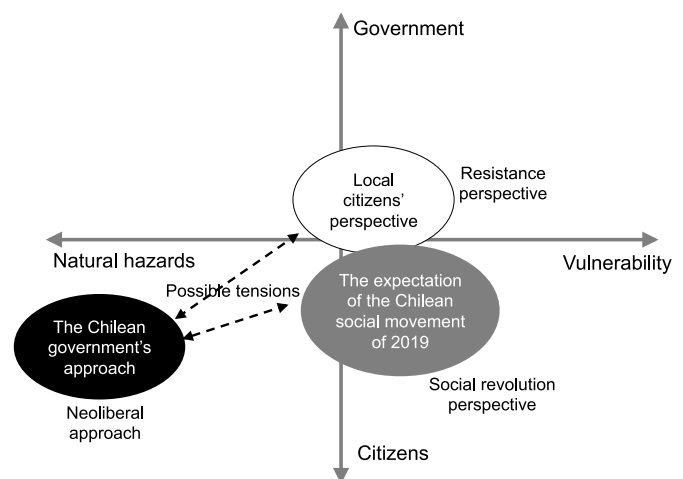


Fig. 7. The Chilean narratives in Concepción.

separate yet interacting forces” [6]. Surely, several anthropologists have tried to avoid the nature vs. human divide (A. J [112]). But this derangement is still palpable in the widely accepted anthropocentric view of disasters that define them as events that cause harm to people. A focus “on saving human lives” emerges from this modern epistemology, one that “is often used to deploy a discourse of security and feed neoliberal responses [...] and an emphasis on economic recovery” [113]; p. 144). The perception of “danger” and “instability” linked to climate vulnerability has become a justification for disaster capitalism in countries such as Chile [113]. In Cuba, authorities concerned with how climate affects people are making efforts to relocate those living in areas perceived as “disaster prone.” Coastal residents, instead, do not see themselves as “vulnerable enough” to be relocated, and prefer continuity and support in their original locations. They also regard the protection of their territory as their own responsibility in times of climate change.

In some accounts that derive from the great derangement, it is considered “natural” when natural hazards affect or destroy ecosystems, but “unnatural” when they affect people’s lives. But this narrative does not align with the views of the people and academics in LAC who participated in our work. Our results challenge anthropocentric perspectives of risk in three ways. First, given that climate change is largely caused by human action, the impacts of climate events on ecosystems must also be considered “unnatural.” Fisherfolk, for example, were acutely aware of how human activities disrupt marine ecosystems and deplete fishing stocks, and equally of the need to balance human activities with natural systems. These residents, like many LAC academics, see climate change not as a *scapegoat* for global ills, but the very *consequence* of them. While residents regard the protection of their territory as their own responsibility, including in times of climate change, Colombian scholars have been careful to portray climate effects as a factor in vulnerability creation and environmental degradation that has global origins [114]. Here one additional example: after Hurricane Iota hit San Andrés in 2020, a group of scholars set up a research project to explore its effects in fauna and flora [115]. Second, discussions with residents and observations of their environments made clear that disasters are not rare, extreme events (as conceptualized by some vulnerability theorists) but cyclic, or even ongoing, challenges that affect landscapes and ecosystems on a constant basis. Third, many respondents, as well as local academics, interpreted the emphasis on risks to humans as both justifying the security narrative adopted by authorities and underestimating the importance residents attach to their landscape and their relationships with ecosystems.

These local narratives suggest that scholars’ understanding of disasters need to be enlarged to address: (a) not only the impact of hazards on people but also ecosystems; (b) the responsibility that society has not only regarding the creation of vulnerabilities, but the exacerbation (through climate effects) of natural hazards; and (c) the cyclic interaction between degradation of nature caused by climate change and increases in people’s vulnerability.

The problem of framing: These results suggest that the tools and methods often used to deal with DRR might not be useful to deal with climate change. Dealing with global warming requires approaches that transcend national borders and recognize both the construction of social

vulnerabilities along with the depletion of nature and degradation of ecosystems. Understanding environmental injustices and policy to address them require framings (such as environmental ethics) that might differ from the anthropological vulnerability approaches adopted in the 1990s. In Chile, scholars have developed a method they call “disciplined conversation” in order to address gaps in the understandings of risk and disasters. Through this method, they breach the gap between academic concepts and local understandings of climate change impacts and are able to act as intermediaries between local residents and authorities. This method of constant dialogue is built on empathy and openness to listen and understand different explanations. Results suggest that it can be used in other locations to influence policy and climate action.

People living in conditions of informality in LAC perceive climate change as increasing their vulnerability. These findings suggest that radical constructivists might have two options: to discard this perspective and keep relying on Western definitions of CRDD or to challenge classic concepts to better accommodate this local view. If disasters are the consequence of vulnerability, and climate change causes vulnerabilities, it follows that climate change is one of the causes disasters. This does not mean that climate change is the only cause, but it does mean that responses require forms of action that might lie outside DRR’s wheelhouse.

The problem of climate injustice: Our results invite disasters scholars to enrich concepts and explanations of risk with notions of unequal distribution of environmental benefits, opportunities, and the value of landscape. They show that local explanations of climate risks tend to reflect local grievances—a pattern found by Martinez-Alier [116]—and fit a narrative of climate and environmental injustice [117] rather than a classic narrative of vulnerability theory. Climate justice is seen as a distinct grassroots discourse that emerges from environmental justice [118]. It rejects the notion of “climate first, justice maybe later” [119]: “climate justice focuses on local impacts and experience, inequitable vulnerabilities, the importance of community voice, and demands for community sovereignty and functionality” in contexts of inequality between social groups [120]; p. 359). The narratives that we found in LAC encompass climate justice for *people*, as well as for *nature*; that is, “not just inter-human and intergenerational, but also inter-species perspectives” of distributive justice [121]; p. 11).

Defenders of traditional vulnerability theory might insist that all these considerations have been taken into account since the 1990s by the PAR Model and other DRR concepts. This is partially true: many authors have explored compounded effects (including climate) in vulnerability creation [122]. But we contend that, by neglecting the role of “the hazard,” a few authors who adopt the new radical constructivist approach are missing an aspect that must not be evacuated from climate risk analysis.

4.2. Tensions in practice

The “vulnerabilization” problem: Our empirical results and previous academic work [8] show that different conceptualizations of “adaptation” exist among stakeholders, putting more or less emphasis on reducing exposure (for example, by promoting relocation) or reducing vulnerability.

Table 5
Perceptions of CRRD in the narratives found in the study.

	For government	For residents in informal settings
What are the effects of Climate change in people and society?	Climate change exacerbates hazards	Climate change exacerbates vulnerability
What is Climate change in terms of environmental impact?	Climate change is a cause of environmental threats.	Climate change deepens existing vulnerabilities, may make local knowledge and coping less effective
What are the causes of Climate change?	People’s impact on nature	Social and environmental injustices caused by unfair distribution of benefits and resources
What is the consequence of addressing Climate change?	Climate change consumes resources that are needed for economic growth	Climate change consumes resources that are needed for achieving social aspirations

Most residents in our case studies find that climate events are not always catastrophic. Villagers in Carahatas do not necessarily see themselves as vulnerable to sea-level rise (they believe to have particular knowledge on how to deal with it), those in San Andrés believe they can use age-old practices to address the increasing scarcity of fresh-water, and residents in Yumbo do not see themselves as vulnerable to floods. Instead, they find themselves being unfairly exposed to pollution, crime, deforestation, food insecurity, and other problems. These results confirm a pattern found by Salinas et al. [123] in a study on black and indigenous communities living in water shores in Ecuador.

Highlighting vulnerabilities can lead to a focus on problems that are not perceived as such by local residents. In Canaan, for instance, residents have been left to believe that building in sloped areas is inherently dangerous, when safety is actually contingent on adequate construction techniques. The result is that even when they avoid building in sloped areas, they fail to build disaster-safe structures.

The “territorialization” problem: Previous studies have shown that people’s relationships with their territory are crucial for understanding risk in LAC [124]. Our findings confirm this pattern and show that residents perceive climate change as rapidly modifying their landscapes. Villagers in Carahatas, for instance, have long understood that coastlines change; change is part of their understanding of place. But climate change is also producing new changes with a rapidity that makes adaptation more difficult. In all the locations we investigated, these changes create anxiety for residents who see their knowledge of the territory becoming obsolete, threatening their capacity to respond to changes. When developing DRR micro-projects, residents thereby resort to activities they know and value, such as soccer, pottery, gardening, and urban agriculture. They rely on social practices and rituals that are meaningful and familiar to their communities. Understanding this pattern is crucial to designing DRR and climate responses in the region.

The responsibility problem: Scoville et al. [9] recognize three ways in which climate adaptation is political: the politics of climate change responsibility, the politics of vulnerability, and the politics of adaptation decision-making. We find that these three levels exist in local narratives of CRRD in LAC. A local writer from Haiti, for instance, remarks how her country “produces very little green house emissions, but suffers from major environmental risks caused by global warming” [125]. The way CRRD are perceived by citizens is challenging classical perceptions of who is to blame for disaster risk creation. A non-anthropocentric view of disasters invites us to address not only the distribution of blame for vulnerability creation but also for hazard creation.

Contrary to what Kelman and other authors suggest, we find that it is possible to assume a political view of climate risk while giving a bit more prominence to “the hazard.” Of course, these results must still be taken and examined with prudence. First, the narratives we found are not fixed but dynamic. The evolution of the Cuban government approach to risk and the fluidity of concepts in Haiti (from “anarchic development” to “failed State” and “payi lòk”) prove that disaster explanations evolve as local conditions change. Second, these narratives do not reflect perceptions of risk at large (volcanoes, earthquakes, and other hazards were not considered in our study). Third, they reflect perceptions and reactions to risk in conditions of informality and, as such, cannot be generalized to society at large in LAC. Finally, they are based on qualitative research conducted in the midst of significant social movements, which could have influenced results. Additional studies are required to verify whether these narratives emerge in other moments and circumstances.

5. Conclusions – the importance of understanding CRRD in informal settings

So, does climate change cause disasters? Ethnography, action research in Cuba, Colombia, and Chile, and narrative analysis in six locations in LAC confirm that people living in informal settlements perceive climate change as: (a) a factor that increases their

vulnerabilities; (b) a protracted hazard that endangers landscapes, as well as fauna and flora in their territory; (c) a condition that distracts authorities and people from other immediate daily challenges such as violence, crime, unemployment, food insecurity, and lack of infrastructure; (d) a problem that requires investment in environmental protection; and (e) a consequence of corruption, political negligence, and social, environmental, and climate injustices. These voices challenge modern epistemologies that tend to detach human and natural systems and represent an important counter to the boosters of radical constructivism: climate change is not a scapegoat for global ills, but rather a consequence of and a causal factor in many of them.

Results also suggest that some traditional DRR concepts, methods, tools, and policies to address climate action may or may not be effective, depending on the locality-specific conditions and dynamics. Climate change requires specific frameworks that combine anthropocentric approaches with environmental and climate justice considerations. DRR in times of global warming cannot be tackled if seen exclusively as the impact of socio-political decisions on human beings. Such an approach fails to take into account the role that people in informal settings attach to hazards that they see emerging from environmental injustices. In their view, society is to blame for CRRD, not only in the creation of socio-political and economic vulnerabilities, but also in the exacerbation of hazards through climate injustices, pollution, environmental degradation, and the irresponsible exploitation of nature. By taking into account the ideas and practices of inhabitants in informal settlements, it is possible to see the contours of an alternate understanding of climate change that contrasts with dominant scholarly analysis, and particularly, the vulnerability theory. Policy in the region needs to address the multiplicity of interpretations that exist of risk and vulnerabilities and recognize existing tensions caused by them. A resident-informed approach is crucial for integrating DRR and the climate agenda in LAC. Failure to do so perpetuates an artificial distinction between environmental problems and disaster risk creation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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