Maquiagem: Concealing the politicized nature of urban disaster and housing policy in Petrópolis, Brazil

Tjalf Nathan van Minnen[1]

Robert Coates

Wageningen University and Research, Netherlands

Abstract

Under the intertwined environmental crises of capitalist urbanization, we argue that policies on housing and disaster are merging in order to (further) conceal widespread socio-ecological degradation and disaster risk creation. Following two extensive flood and landslide events in 2022 in Petrópolis, Brazil's 'Imperial City', we examine landslide hazard mapping that led to the condemnation of 'at-risk' areas (a disaster risk policy affecting housing), alongside social rent assistance, a housing policy measure that simultaneously addresses disaster risk. We follow our informants' use of the term *maquiagem* ('make-up'), to demonstrate firstly how the rights-focused discourse of struggle for a safe residence in the city is reappropriated into the capitalist urbanization of nature, and secondly how policy discourses mobilize nature as a "constitutive outside" within urban governance processes. Uniting work in urban political ecology and disaster studies, while extending their intersections with critical housing studies, we show how nominally progressive policies focused on formalizing marginality in urban peripheries discursively construct such areas as 'pre-urban' and *within nature* to strengthen housing markets and financialization while reproducing vulnerability and exclusion from governmental support. Housing policy often promotes a narrative of equal citizenship and risk reduction, but its reproduction of in/formal distinctions is based on a politicized discourse of urban nature and feeds into ongoing disaster risk creation.

Key words: urban political ecology, housing policy, disaster risk creation, Brazil, urban governance

Résumé

Dans le contexte des crises environnementales interdépendantes de l'urbanisation capitaliste, nous soutenons que les politiques de logement et de catastrophe se confondent afin de dissimuler (davantage) la dégradation socio-écologique généralisée et la création de risques de catastrophe. Suite à deux inondations et glissements de terrain de grande ampleur en 2022 à Petrópolis, la « Ville Impériale » du Brésil, nous examinons la cartographie des risques de glissements de terrain qui a conduit à la condamnation des zones « à risque » (agissant ainsi sur le logement), ainsi que l'aide sociale au loyer, une mesure de politique du logement qui a agi sur la réduction des risques. Nous explorons l'utilisation du terme « *maquiagem* » (« maquillage ») par nos informateurs, afin de démontrer, premièrement, comment le discours axé sur les droits et la lutte pour un logement sûr en ville est réapproprié par l'urbanisation capitaliste de la nature, et deuxièmement, comment les discours politiques mobilisent la nature comme un « extérieur constitutif » au sein des processus de gouvernance urbaine. En unissant les travaux « urban political ecology » et d'études sur les catastrophes, tout en élargissant leurs intersections avec les études critiques sur le logement, nous montrons comment des politiques prétendument progressistes, axées sur la formalisation de la marginalité en périphérie urbaine, construisent discursivement des zones dites « pré-urbaines » et en pleine nature afin de renforcer les marchés du logement et la financiarisation, tout en reproduisant la vulnérabilité et l'exclusion des aides gouvernementales. Les politiques du logement promeuvent souvent un discours d'égalité citoyenne et de réduction des risques, mais

---

[1] Mr Tjalf Nathan van Minnen, Sociology of Development and Change, Wageningen University and Research, Netherlands. Email: tjalf@upcmail.nl. Dr Robert Coates, Sociology of Development and Change, Wageningen University and Research, Netherlands. Email: robert.coates@wur.nl. The authors thank the peer-reviewers and editors for their time and detailed, attentive work to clarify the article's argument. The authors confirm that generative AI was not used to produce any substantive writing on this manuscript.

leur reproduction de distinctions informelles/formelles repose sur un discours politisé sur la nature urbaine et alimente la création continue de risques de catastrophe.
Mots-clés: urban political ecology, politique du logement, création de risques, Brésil, gouvernance urbaine

Resumen

En el contexto de las crisis ambientales interconectados de la urbanización capitalista, argumentamos que las políticas de vivienda y desastres se fusionan para ocultar, aún más, la extensa degradación socio-ecológica generalizada y el incremento de riesgos de desastre. Tras dos extensas inundaciones y deslizamientos de tierra en 2022 en Petrópolis, la "Ciudad Imperial" de Brasil, examinamos el mapeo de riesgos de deslizamientos que condujo a la expropiación de zonas "en riesgo" (actuando así sobre la vivienda), junto a la asistencia mediante alquiler social, una medida de política habitacional que actuó sobre la reducción del riesgo. Exploramos el uso que hacen nuestros informantes del término "*maquiagem*" (maquillaje) para demostrar, en primer lugar, cómo el discurso centrado en los derechos de la lucha por una residencia segura en la ciudad se reapropia para la urbanización capitalista de la naturaleza y, en segundo lugar, cómo los discursos políticos estatales movilizan a la naturaleza como un elemento "externo constitutivo" dentro de los procesos de gobernanza urbana. Desde la intersección de la ecología política urbana y estudios de desastres, y a la vez extender sus intersecciones con estudios críticos de vivienda, mostramos cómo políticas aparentemente progresistas, centradas en formalizar la marginalidad en las periferias urbanas, construyen discursivamente dichas áreas como "pre-urbanas" y dentro de la naturaleza para fortalecer los mercados inmobiliarios y la financiarización, mientras reproducen la vulnerabilidad y la exclusión del apoyo gubernamental. Las políticas de vivienda suelen promover una narrativa de ciudadanía igualitaria y reducción de riesgos, pero su reproducción de distinciones informales/formales se basa en un discurso politizado sobre la naturaleza urbana y promueve la continua creación de riesgo de desastres.
Palabras claves: ecología política urbana, política de vivienda, creación de riesgo, Brasil, gobernanza urbana

Resumo

Sob as crises ambientais interligadas à urbanização capitalista, argumentamos que as políticas sobre habitação e desastres estão se fundindo para (ainda mais) ocultar as realidades da degradação socioecológica generalizada e a criação de riscos. Após dois grandes eventos de inundação e deslizamento de terra em 2022 em Petrópolis, a "Cidade Imperial" do Brasil, examinamos o mapeamento de riscos de deslizamentos de terra que levou à condenação de áreas de risco (atuando, portanto, na habitação), juntamente com o auxílio-aluguel social, uma medida de política habitacional que atuou na redução de riscos. Exploramos o uso do termo "maquiagem" por nossos informantes para demonstrar, primeiramente, como o discurso focado em direitos da luta por uma residência segura na cidade é reapropriado pela urbanização capitalista da natureza e, em segundo lugar, como tais discursos políticos mobilizam a natureza como um "exterior constitutivo" dentro dos processos de governança urbana. Unindo trabalhos em ecologia política urbana e estudos de desastres, ao mesmo tempo em que ampliamos suas interseções com estudos críticos de habitação, mostramos como políticas nominalmente progressistas focadas na formalização da marginalidade nas periferias urbanas, se baseiam na construção discursiva dessas áreas como "pré-urbanas" e "dentro da natureza", a fim de fortalecer os mercados imobiliários e a financeirização, ao mesmo tempo em que reproduzem a vulnerabilidade e a exclusão do apoio governamental. A política habitacional frequentemente promove uma narrativa de cidadania igualitária e redução de riscos, mas sua reprodução de distinções informais/formais baseia-se em um discurso politizado da natureza urbana e alimenta a criação contínua de riscos de desastres.
Palavras-chave: ecologia política urbana, política habitacional, criação de risco de desastres, Brasil, governança urbana

1. Introduction

Under intertwined environmental crises, new social and technical policies are emerging with the governmental justification of shoring up 'livable' urban space in the face of (climate) disaster risk, while routinely displacing marginalized or informal populations (Anguelovski *et al.,* 2018; Marchezini, 2018; Mendes Barbosa & Coates, 2021; Millington, 2018; Souza, 2015; Zeiderman, 2012). While such risks are widely perceived to emanate from nature outside the city, urban political ecologists have long asserted that capitalist urbanization is itself constituted by degraded natures, which create problems and hazards to which new policies

and monitoring are addressed (Carraro *et al.*, 2021; Davis, 1999; Marks & Baird, 2025; Swyngedouw & Kaika, 2014). As crises intensify, 'disaster risk creation' is concealed to an ever-greater extent by policies purportedly aimed at risk reduction (Collins, 2009; Lewis & Kelman, 2012; Muir & Opdyke, 2024; Siddiqi, 2022). In this article, we push forward these considerations using an in-depth case study of Petrópolis, Rio de Janeiro State, Brazil, following two flood and landslide events that occurred on 15th February and 20th March 2022, in which at least 240 people died and thousands became homeless (Coelho Netto *et al.*, 2022).

More specifically, we show that the twinned demands of addressing urban disaster risk and guaranteeing the right to (safe) housing produce a merger of these policy domains, particularly in the context of rapid urbanization in the Global South. To date, little has been written on the application or reformulation of housing policy for risk management purposes, despite longstanding concerns over displacements of poor or informal populations undertaken in the name of 'natural' or 'climatic' risk. While this merger might be read as a healthy realignment of policy fields long since constrained by neat nature/society and technical/political binaries, we find that such policies are reinforcing capitalist urbanization processes, including the financialization of housing and the formal property regime. At the same time, they operate against a nature viewed as external to the city, ultimately leading to the recreation of informality, disaster vulnerability and risk (Oliver-Smith *et al.*, 2017; Rolnik, 2019). We focus on risk/hazard mapping – a disaster risk reduction (DRR) policy focusing on housing that led to evictions of informal residents – and on social rent subsidy, essentially a housing policy now incorporated into DRR, designed to enable the rental of alternative accommodation. Both policies, we argue, depend on discursive imagery of the city's 'constitutive outside', in which forces of nature external to urban expansion delineate formal/informal designations within urban governance. Housing policy responses to the disaster in Petrópolis, co-opting progressive narratives of equal rights, citizenship, and risk reduction, obscure a proliferation of hazardous capitalist urbanization – in effect risk creation – rather than working as weapons against it (Muir & Opdyke, 2024).

We recognize that the condemnation of 'risk areas' may remove (some) people from dangerous locations and that social rent may help (some) people to find a home. Yet a broader analysis contextualizes and nuances the adverse effects of such policies for those evicted. Unable to find a safe place to live, marginalized populations are further excluded from state support through their illegal status when there is a withdrawal of state services from condemned areas. Study informants described this new DRR/housing policy merger as '*maquiagem*' – or 'make-up' – precisely because it conceals chronic marginalization and vulnerability in the urban periphery while claiming that it acts upon it. Concurrently, in opposition to the peripheral experience, the city's historic urban core is restored to its former glory. Our own analysis, in turn, theorizes *maquiagem* as underpinned by the urban's constitutive (natural) 'outside': risk is concealed though through capitalist urbanization.

In 2022, although large parts of the city were affected, there was a stark contrast between flooding in lower, more central, areas, and the high death toll and damage to informal hillside housing where most of the 149 landslides occurred (Platonow, 2022). In response, housing policies implemented post-disaster fulfilled a narrative that the constitutional right to safe housing (*moradia adequada*) was respected, yet simultaneously obscured that many people were worse off after its implementation. In other words, risk mapping and social rent contributed to a governance narrative that problems with natural hazards were dealt with, while formal citizen rights were addressed. In doing so, the politicized use of discourses of nature allows the drivers of hazardous urbanization to persist, including housing's financialization and a cycle of recurring disaster.

The 2022 disaster was far from atypical. Similar events in 1966/1967 and 1988 killed 1,000 and 320 people respectively (Schuster & Highland, 2007). In 2011, the wider region experienced Brazil's largest disaster in terms of fatalities, with some 900-1,400 people killed, 15,000-35,000 losing their homes, and with damage estimated at R$4.8 billion (US$857m) (Ávila *et al.*, 2016; IBRD, 2012). Recognizing the need for DRR, from 2005 onwards President Luiz Inácio 'Lula' da Silva's first progressivist government enshrined UNDRR principles based around housing policy (Bittencourt *et al.*, 2013; Da Costa & Pospieszna, 2016; UNDRR, 2015). The political commitment to DRR and the constitutional right to *moradia adequada* – the principle that every Brazilian has the right to safe housing – is real (Monteiro & Veras, 2017; Santos *et al.*, 2016). This background frames the present study: DRR policies like the repeated creation of natural hazard maps to assess spatial exposure have become aligned with housing policies like *Minha Casa Minha Vida* (MCMV – 'My House My

Life'), a nationwide low-income housing construction program (Da Costa & Pospieszna, 2016; Lima, 2018). We present such actions as *maquiagem*, because they address risks from nature external to the city, rather than vulnerabilities internal to capitalist urbanization.

The next section reviews literature from urban political ecology and related work on disaster risk creation, before turning to intersecting questions on in/formality and housing, including changes in the latter's financialization process. We then outline the field research methodology before turning, in the fourth section, to a historical political ecology of hazardous urbanization in Petrópolis. In the fifth and sixth sections we explore policy discourses on hazard mapping (*'mapas de risco'*) and social rent respectively, uniting two hitherto separate domains of urban governance. We detail the perspectives of the concerned population, who outline how they not only fell victim to landslides, but also exclusion from state support. Together, we show that the condemnation of risk areas and the uneven provision of social rent created a narrative that the principle of the right to safe housing was upheld, while obscuring the deeper inequalities created through exclusion from the marketized social rent system, thus reproducing informality at the fringes of the city 'in nature.' We finish with a short conclusion.

2. The constitutive outside(s) of urban disaster risk and housing policy

In this section we link urban political ecology with cognate work on vulnerability to disaster and risk creation, and housing policy and financialization. This includes links between housing, informality, disaster vulnerability, and critiques of displacement undertaken as a part of disaster response or in anticipation of future (climatic) risk. Housing policy (and cognate studies) should failed consider disaster risk, and the environment more broadly, within its socio-economic framing. Disaster management needs to consider the politicization of nature in the city.

Urban political ecology has advanced a sophisticated understanding of the ways in which material and discursive natures are metabolized through capitalist expansion (Swyngedouw & Heynen, 2003; Zimmer, 2010). Focused on the urbanization of nature rather than assuming a preexisting city, this is a processual understanding that takes inspiration from Lefebvre's notion of urbanization as a planetary phenomenon (Kaika *et al.*, 2023; Lefebvre, 2013). The urban 'triumph' over nature has included the extension of infrastructural engineering to control and accelerate flows of natural resources in and out of the city – including water and waste – as well as using quantitative urban economic modelling to approximate the socio-economic results of such flows (Swyngedouw & Kaika, 2014). Rapid, unceasing urbanization routinely produces new forms of degraded urban nature and environmental hazards, unevenly spaced and with the socio-economic exploitation of the poor. Urban theory and cognate social policies on (for example) rights, housing, and citizenship have conventionally denaturalized the city, constraining it into a technical, social and political domain without nature (Davis, 1999; Gould *et al.*, 2016; Swyngedouw & Kaika, 2014).

Roy's (2016) use of the term 'constitutive outside' is useful to elucidate this concurrent externalization and (re-)appropriation of the natural environment or nature within policy discourses on housing in the context of urbanization.[2] Roy shows how the urban is impossible without imagining what lies beyond it. Imaginaries of what constitutes 'the rural' are important for the creation of value in cities, as well as for economic growth and cultural identity. The inside/outside refrain has of course been central to studies of uneven geographical development and (urban) political ecology since their earliest inspirations, notably Cronon (1992) and Smith (2010). Applied to the problematic of vulnerability to disaster and the creation of risk, we use the 'constitutive outside' to explore nature (and natural hazard) as a category "deployed in the repetitious work of [urban] government" (Roy, 2016, p. 5). The urban's constitutive ecology is transformed, creating hazards that in turn lead to deeply contradictory technical and social interventions that place nature and hazard 'outside' in their efforts to shore up expanding urban space.

[2] The 'constitutive outside' is usually attributed to Laclau and Mouffe (1985) who drew on themes from Derrida to indicate radical antagonisms within social theory, such that the real/material is discursively constituted by that which it is not. Roy productively extended this into urban theory, and we in turn employ it in the context of urban environmental governance.

Globally, urban (flash) floods have increased in intensity while landslides have become ten times more frequent in the past fifty years, the vast majority at urban fringes in poorer regions (Cendrero *et al.*, 2020; Froude & Petley, 2018). Urban expansion into ecologically and geologically dangerous areas on floodplains and hillsides – often already degraded through deforestation – increases runoff, while paved surfaces and construction reduce soil permeability (Coates, 2019; Karvonen, 2011; Millington, 2021), something further revealed by climatic variability. Densification of lower quality housing in locations exposed to landslides and floods may occur near sources of (often precarious) employment that also lack basic facilities and state services (Bodo, 2019).

In Brazil as elsewhere, the engineering of river infrastructures, linear parks, or hillside containment, designed to mitigate the effects of 'external nature', (re)create urban 'hazardscapes' via displacement and resettlement of marginalized populations. By displacing them to new, potentially vulnerable situations, the socio-environmental protection of wealthier and more privileged groups is eased (Coates & Nygren, 2020; Collins, 2009; Millington, 2018). In many cities in hilly areas, the displaced occupy hillsides, reinforcing erosion and socio-spatial vulnerability, thus producing a cycle of disaster risk creation (Rasch, 2017). The prioritization of wealthy parts of the city over peripheral areas is amply illustrated in São Paulo state, where buffer zones were created after a flood to legitimize resident displacement (Marchezini, 2015), or in Rio de Janeiro, where climate change discourse was used to demarcate 'risk areas' to expel *favelas* from high-value land (Mendes Barbosa & Walker, 2020). Political ecologists and geographers have argued that 'disasters are not natural' (see Smith, 2006) and this has included in-depth questioning of the role of disaster risk reduction (DRR) language, knowledge and practice because it obscures such risk-creating actions (Chmutina & Von Meding, 2022; Lewis & Kelman, 2012; Muir & Opdyke, 2024; Oliver-Smith *et al.*, 2017). Cognizant of the creation of disaster through exploitative development in a postcolonial context, Siddiqi (2022) warns that the 'natural' descriptor masks disaster, and is a form of violence perpetrated by imperial and market forces. UNDRR's (2025) partial correction through the phrase 'hazards are natural, disasters are not' does little to overcome this. Societal decisions and practices are entirely intertwined with their effects on and reactions to nature, and the use of the term begs further exploration where there is ongoing uneven development (Smith, 2010). Aligning this task with urban political ecology requires further exploration of the constitutive nature of capitalist urbanization in cycles of socio-environmental degradation (Marks & Baird, 2025). We take these concerns forward with our interest in the 'constitutive outside' of the urban, and more specifically to demonstrate how 'natural risk' discourses mediate legal-territorial designations of formal and informal housing, through which the financialization of housing within the urbanization process operates.

Housing quality is deeply important for disaster vulnerability, with the UN's Hyogo (HFA) and Sendai frameworks promoting an integration of policies to do further than disaster management towards addressing the societal determinants of risk (UNDRR, 2015). Yet in the context of the urban's 'constitutive outside', where hazards appear as a force of nature external to urban expansion, the analysis of such 'societal determinants' seems decidedly one-dimensional. The interactions, overlaps (and 'merger') of housing policy and DRR are significantly underexplored, and frequently focused only on the impact of a disaster on housing (Comerio, 1997), or on the barriers and limitations to post-disaster reconstruction (Finch *et al.*, 2010; Peacock *et al.*, 2014). Similarly, in disaster studies, informal housing is usually assumed to be a pre-existing 'fact', places with inadequate safety and where evictions and legal insecurity are most intense after disasters, inhibiting effective reconstruction (Lizzaralde & Davidson, 2007; Talbot *et al.*, 2020; Tumini & Poletti, 2019). While such studies appear to offer self-evident findings, they may also undermine investigations of urban governance because the interpretation and designation of 'informal housing' and its consequent vulnerabilities are embedded in capitalist urbanization (Bodo, 2019; Da Costa & Pospieszna, 2016; Twigg, 2002; Zhang, 2016). Often, post-disaster housing policy is confined within the technocratic and market rationality of ecological modernization, in which negative 'externalities' are reappropriated into market logics (Swyngedouw & Kaika, 2014).

In Brazil (as in other places), informality involves construction on public land that is usually deemed illegal or undertaken with illegally issued permits in clandestine subdivisions (Ferreira, 2009; Pino, 1997). *Favelas* are treated as a problem and removals occur often, repeating *ad finitum*, often legitimized under an environmental protection narrative including disaster risk mitigation or climate adaptation (Anguelovski *et al.*

2018; Marchezini, 2018; Millington, 2018; Souza, 2015). For some scholars this re-articulates 19th century discourses of the poor's 'unhygienic' nature: today, sped up in anticipation of climate catastrophe or apocalypse (Mendes Barbosa & Coates, 2021). Informality, via its apparent 'environmental ill-health' or enhanced exposure to hazards, can be constructed discursively as residing 'within nature' (Oliver-Smith, 2004). Yet simultaneously this nature is presented as pre-urban: the word *urbanização*, rather than signifying urban expansion, is colloquially equated in Brazil with the legal formalization of the urban periphery. In effect – discursively at least – the *favela* can be brought into modernity through a process that emphasizes a nature superseded by the triumph of formal urban extension (Gandy, 2005). Actually-existing informal settlements would, in a sense, be re-urbanized as part of the modern legal-state project of extending rights and services (Maricato, 2002).

This all appears to contradict the fact that *favelização* ('favelization') has been tolerated – or at least considered a necessary evil – in light of the housing crisis at the heart of Brazil's developmentalist era, with laws and practices protecting informal housing, for instance in the 1988 Constitution, which recognized land rights for residence of over five years, provided owners have no alternative property (Da Costa & Pospieszna, 2016; Fix & Arantes, 2022). In practice, *favelas* continue to develop with little resistance or even with support from governmental authorities, given demand for labor and opportunities for clientelist vote-winning and expansion of privatized utilities (Coates & Nygren, 2020). Yet land rights do not equate to equitable access to services or to infrastructures (such as effective drainage or hillside retention) to make such areas safe. The residents of such spaces perennially require more or better forms of urbanization to lift themselves 'out of nature' in the eyes of the state, and find themselves not only vulnerable to disaster risk, but also to removal by repeated governmental interventions under the guise of 'protection', 'risk reduction', or 'formalization.'

This chimes, at least in part, with Rolnik's (2019) exploration of the global financialization of housing, in which real estate and private rental markets hold sway over public land and housing, a key extension of exchange over use value that fulfilled a significant chunk of GDP growth in recent decades. For Rolnik, designations of urban in/formality are opaque and open to revision because "the state produces its margins" (2019, p. 6; see also Roy, 2016). Public land at urban fringes can be held in 'reserve' to fortify competition for private property ownership in formal urban space, and hence surplus value creation within (or 'against') existing city boundaries, until such time as governance processes see fit to 'unlock' territorial borders for further market expansion (Roy, 2016; Rolnik, 2019; Telles, 2015). *Favela* removals or evictions, for Rolnik, link clearly to the strengthening of private rental markets, private property ownership, and new opportunities for construction and real estate interests to allocate new urban territories. This emphasis on urban bordering as critical to capitalist urbanization suggests alignment with a 'constitutive outside' demarcating the urban from the rural (the populated or built environment from that unpopulated or unbuilt). Yet, the fact that these commodification dynamics increasingly revolve around competition for safe urban space (see Monteiro & Veras, 2017) suggests an absence of critical engagement with nature (and natural hazard) as the urban's constitutive outside. Our analysis will demonstrate how uneven urbanization and its financialization buffer against nature, demarcating areas considered more or less 'environmentally fragile' and reacting to 'natural' disaster rather than to the urban's own constitutive ecology.

Analyzing how housing policy and disaster management intertwine in informal spaces helps us explore processes of urbanization through the creation of vulnerability and risk, a central concern of urban political ecology. If risk management tends to analyze the 'nature' of disaster without the socio-political context of risk creation, then housing policy is conversely analyzed as a socio-political sphere without its constitutive (environmental) outside. Debate over 'environmental risk', and nature more broadly, should be viewed as key domains of conflict over the 'right to the city' and resistance to capitalist urbanization and the financialization of housing. When considering efforts to legally formalize *favelas* and peripheral areas, effective sanitation and sewerage is routinely withheld for reasons of cost, resulting in long term soil saturation by (waste)water and a ticking time-bomb for landslides, which then occur under even low rainfall (Nogueira & Paiva, 2018). The 'right' to inhabit such spaces, then – as well as the right to enjoy the infrastructures carrying waste(water) out of the city (Swyngedouw & Kaika, 2014) – is compromised if the political ecology of those spaces is undermined or ignored, in terms of the flows of water and soil that constitute them. Nogueira and colleagues convincingly point to the fact that 'environmental risk' is more a matter of distribution of urban quality than

anything else: the application of fairly simple drainage infrastructure in urban peripheries would mitigate combined landslide and health/sanitation risks (Nogueira & Souza, 2020) with little need for evictions, resettlement, and divisive social rent housing policies. Displacement serves political and economic aims over humanitarian ones (Souza, 2015).

In the remainder of the article, we explore the integration of policies for housing and disaster management, as indicative of governmental responses to the contemporary socio-environmental crisis of capitalist urbanization. Next, we briefly outline the research methodology before providing a short history of the case study site. We then proceed to examine hazard mapping and social rent policies.

3. Researching housing and disaster in Petrópolis

Field research was undertaken by the first author between April and July 2022 in Petrópolis, two to five months after the flood disaster. The second author has worked on disaster risk in the same region.[3] Semi-structured interviews were carried out with 33 respondents, including 21 residents, eight state- or municipal-level officials responsible for disaster and housing management, three geography, geology, and sociology academics at universities in Rio de Janeiro and São Paulo, as well as one civil rights leader. The 21 residents (14 male, 7 female) were of various/mixed ethnic backgrounds and lived in one of the informal neighborhoods at the time of the disaster.[4] At the location, landslide-susceptible areas had been mapped and the *aluguel social* (social rent) program was in active operation. From this base, the first author chose relevant empirical content and developed the initial argument. Through an iterative process, the two authors then wrote and revised each section, exchanging drafts multiple times, to extend the article's theoretical basis, structure, and analysis. Our analysis, then, is based on the immediate post-disaster period and does not mobilize data from changes in housing and DRR policy made since. We are confident in the approach taken, nonetheless, especially given that landslide disaster is a recurring theme in this region. We suggest that policy changes and mobilization by social movements suggest urban governance is more aware of nature and risk discourses.

Most resident respondents were from the informal neighborhood or *favela* known as Morro da Oficina, in the Alto da Serra district of Petrópolis, where a landslide destroyed approximately 80 houses and killed at least 90 people (Figure 1). The neighborhood's name originates in a train station workshop (*oficina*) located at the site through the nineteenth and much of the twentieth century, part of the now-defunct railway connecting the inland mines of Minas Gerais to Rio de Janeiro at the coast. After the tragedy of February 2022, much of Alto da Serra was condemned as an *área de risco* (landslide hazard-susceptible area). Some of the respondents from this area had moved to safe housing with help from *aluguel social* while others remained in, or had returned to their neighborhood, even when this was prohibited.

[3] We both have close family connections to Brazil and are Portuguese speakers, but we acknowledge our positionality as Global North scholars and accept that there will be local dynamics we were unable to uncover or analyse. We used Latin American and international sources to advance our argument and extended our reading of Brazilian scholars. Still, there will be absences in references from within Brazilian urban studies, which arise from our own academic context and standpoint. Responsibility for omissions or errors is entirely our own.

[4] Data collection and storage for this research was conducted in line with the ethical standards and regulations of Wageningen University. Interviews with residents were conducted with informed consent and full anonymity. After introducing the research purpose, interviewees gave verbal consent to use their information, agreeing that they could retract detail during and after interviews, though no one wished to do so. They were also given the opportunity to ask questions. In all cases, respondents consented to audio recordings of interviews.

Figure 1: Morro da Oficina as seen from Rua Dom João Braga in 2019. Source: Google Maps (left), and seen from Rua Santo Antônio in May 2022 after the disaster (taken by the first author, right). Some residents from this neighborhood found an apartment in the red housing blocks seen in the front.

Most 'professional' respondents were found through snowball sampling, building on initial meetings with academics. Several technical-oriented flood managers at state or municipal government levels were working on projects to assist residents. 'Residents' were found during visits to affected areas, initially with *Defesa Civil* (Civil Defense) personnel, but then independently for pre-arranged meetings at sites including at Morro da Oficina, Rua 24 de Maio and in an apartment complex where many people were rehoused after the tragedy. Respondents passed on contact details of others that had experienced the February disaster and its aftermath.

Field visits and informal conversations accompanied the formal interviews, and proved important to find out where prevention or recovery works (*obras* in Portuguese) were taking place. These visits also helped to understand what had happened. One visit was guided by two *Defesa Civil* employees to the most affected areas – Morro da Oficina, Chacará Flora and Vila Felipe – a second one took place with a geologist from the Federal University of Rio de Janeiro (UFRJ), while the third and fourth were guided by local residents. In these visits, the first author was informed about landslides and damage, historical and current disaster risk across the city, and the urgency of the housing situation for the affected population. Secondary sources examined before, during and after the fieldwork explored the historical development of Petrópolis as well as current housing and disaster management policies, and triangulated findings from the interviews and field visits. Data are combined in the following sections.

4. Exploring disaster creation in the Imperial City

We explore disaster creation in Petrópolis through a historical materialist perspective, where socio-spatial inequalities are understood to be a product of capitalist urbanization stemming from the colonial exploitation of Brazil's Southeast. This has transformed the Atlantic Forest, and industrial and urban growth has meant the city has geospatial inequalities, and hazards that predominantly affect poorer areas. We engage

with key themes of urban political ecology: the exploitation of nature and unequal power relations, and relate these to questions on in/formality and unsafe housing.

Petrópolis is a city of about 300,000 inhabitants in the state of Rio de Janeiro (RJ), Brazil (Figure 2). Located in the Atlantic Forest in one of the highest parts of the Serra do Mar mountain range, surrounded by steep slopes which peak at 2,300m, it receives significant rainfall. Together with tectonic instability, the region is exposed to floods and erosive landslides, and human developments have severely increased disaster risk (Ávila *et al.*, 2016). With forest replaced by often unstable housing, and higher areas dominated by grassland on granite and gneiss geology, landslides are relatively easily triggered by short and heavy rainfall events (Da Silva *et al.*, 2016).

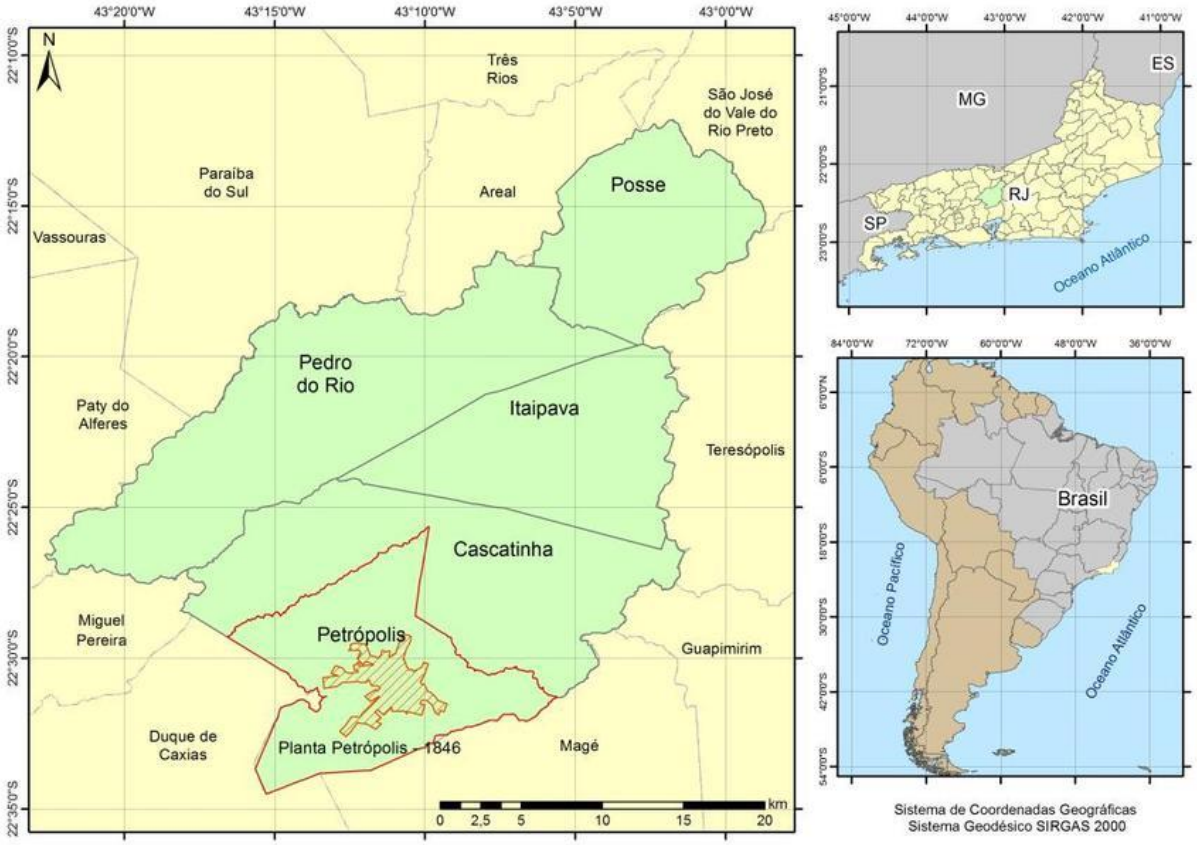

Figure 2: Location of Petrópolis in Rio de Janeiro State and in South America. Original by Dos Santos *et al*. (2017), https://creativecommons.org/licenses/by/4.0/

Petrópolis' exposure and vulnerability can be traced back to the colonial exploitation of the Atlantic Forest. From the 1500s, settler colonialism and an economy built on Indigenous and Afro-Brazilian slave labor pushed for the gradual commodification of land in Brazil, with booms in sugar, gold, and coffee taking place in the 17th, 18th, and 19th centuries. These led to rapid and comprehensive deforestation (Absell, 2020; Coates, 2019; Dean, 1997). After the coffee boom, the summits and flanks of hills became increasingly deforested to make way for cattle pasture, leading to greater erosion and making the entire region more prone to landslides and floods (Machado *et al.*, 2019; Nehren *et al.*, 2013).

While forests persist (Figure 3), much of it is secondary or tertiary, interspersed with exotic flora such as banana, Araucaria and Eucalyptus, which provide less soil stability than native species (Coates, 2019). Furthermore, where hillsides retain tree cover but not on the plateaus above – as is the case for areas such as

Morro da Oficina – this facilitates the infiltration of rainwater into the soil and rocks, and better cover on the flanks provides mass that can become unstable (Cerri *et al.*, 2020). Claims that such landslides are 'totally natural' – by residents and technical professionals alike – should be treated with caution as they reveal a specific discursive vision of nature as the 'constitutive outside' of the city.

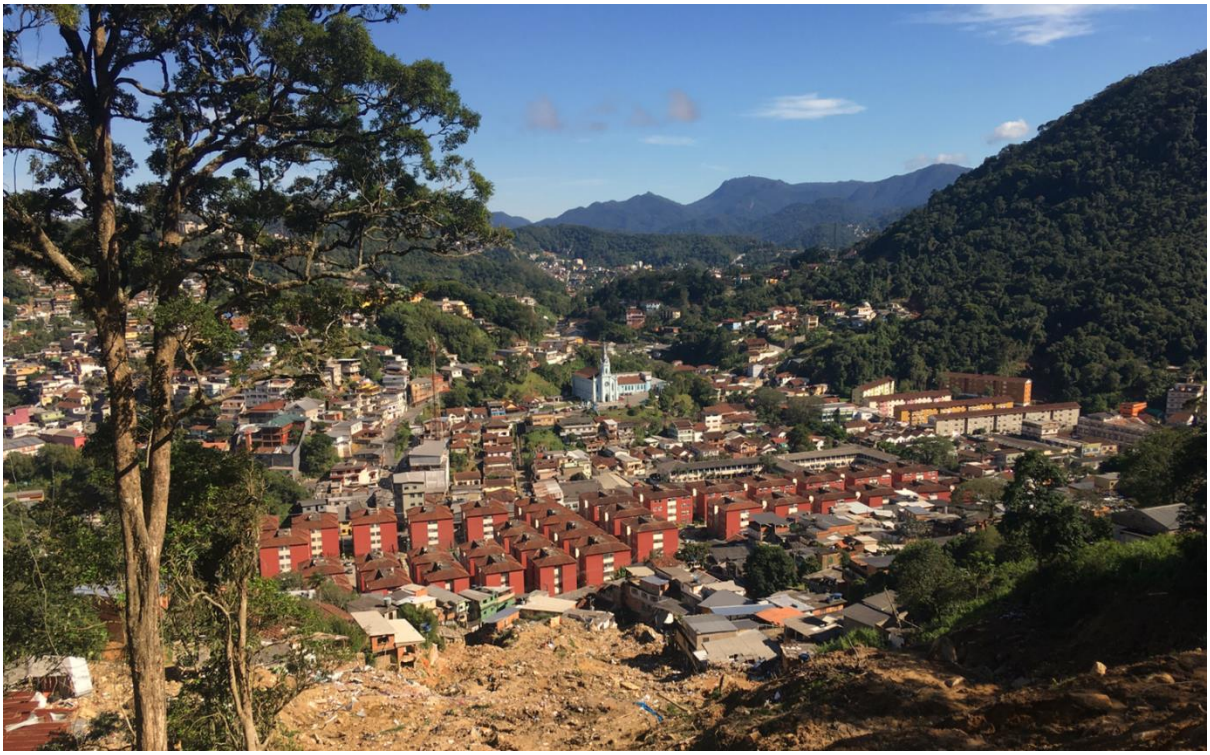

Figure 3: Forested hillsides make up much of the landscape of Petrópolis. Image taken by the first author from the point of origin of the Morro da Oficina landslide.

The establishment of the city of Petrópolis in 1843 was part of the exploitation and commodification of the Atlantic Forest for capital accumulation. There was some consideration of the region's environmental vulnerabilities. Emperor Dom Pedro II, drawn there to escape the heat of Rio de Janeiro, assigned German engineer Julio Koeler to plan a modern city – the first law regulating land use (Fernandes *et al.*, 2017; Rabaço, 1985). A 'triumph' of infrastructural control over nature (Swyngedouw & Kaika, 2014), the plan comprised an 'octopus'-shape with a now-historic center, including the Imperial Palace and sacred architecture, from where roads flowed outwards through valleys like eight 'octopus arms' alongside the Quintandinha, Palatino and Piabanha rivers. Waste was carried out of the city by a sewage system, meaning that the rivers remained free of pollution (Guerra *et al.*, 2007). Importantly, Koeler only allowed further construction on subdivided housing lots in lower areas, leaving hilltops and steep slopes free from construction as a protective measure.

The imperial institutions made Petrópolis inaccessible to those without resources. The *Superintendência da Fazenda Imperial* (Imperial Treasury), directly responsible for city assets, was eventually replaced by the *Companhia Imobiliária de Petrópolis* (Real Estate Company of Petrópolis) which today still protects the interests of imperial heirs and maintains tax collection on parceled land within the Koeler Plan (Ambrozio, 2012). This tax – 2.5% on all property sales – contributes to high land prices and restricts poorer people's access to housing, while protecting the city's vested interests (Da Fonseca, 2011; Pomaroli, 2022).

By the mid-19th century, all land in the Koeler Plan was occupied. A new wave of settlement followed from the late 19th century, following the abolition of slavery in 1888 and the creation of a textile industry by German migrants (Da Silva Cabral & Lopes, 2016). The abolition of slavery came shortly after the introduction of the *Lei das Terras* (land law) in 1850, mandating that land must be purchased from the state rather than granted to settlers as it had been previously (Cavalcante, 2005). Consequently, freed slaves had no opportunity to claim rural land and many sought opportunities in the cities, settling on public lands outside official city boundaries whilst simultaneously providing much of the industrial and service labor for economic growth inside them (Mendes Barbosa & Coates, 2021; Fix & Arantes, 2022; Maricato, 2003). During the industrial development of the region, railroads were constructed between the mines of Minas Gerais and Rio de Janeiro, and in 1883 the first train arrived in Petrópolis at the Alto da Serra station. Factories survived for about a century, closing between 1960 and 1990, with the station also closing in 1964. During this time, Petrópolis grew from 40,000 inhabitants to almost 250,000, with the migrant population comprising the diverse rural Brazilian poor, including emancipated Afro-Brazilians and their descendants as well as Europeans drawn to work in Brazil's new industries.

Population growth continued as 'The Imperial City' projected itself as a tourist destination (Assis Dias *et al.*, 2018). For a century or more, migrant settlement has been largely unregulated, occurring in previously protected areas such as Morro da Oficina. Landslide disasters in 1966, 1988, 2011 and 2022 in Petrópolis are testament to this processual urbanization of nature, acts of risk creation concealed by repeated rounds of 'risk reduction' (Marks & Baird, 2025; Muir & Opdyke, 2024; Oliver-Smith *et al.*, 2017), and merging with policy initiatives on housing under the discursive rubric of 'climate risk' in the contemporary moment (Anguelovski *et al.,* 2018; Mendes Barbosa & Coates, 2021).

5. In/formality, rights, and the nature of urban disaster

In this section, we explore how disaster risk and housing policy end up in a cycle of self-reproduction that augments vulnerability through processes of peripheral resettlement. In consequence, urban governance responds by reproducing the boundary between formal and informal. We extend urban political-ecological analysis by showing how efforts to deal with purported 'environmental extremes' reproduce the imaginary of a city that supersedes nature. We focus on *favelas*, informal neighborhoods that have a paradoxical status in Brazil's rationale of citizen protection. On the one hand, the right to housing is protected, yet governmental practice of this socio-political right excludes ecology by permitting or enabling settlement in precarious areas as part of a housing solution. On the other hand, informal neighborhoods are officially illegal, and associated with the risk of disaster in a nature viewed as external to the city. The socio-political context of vulnerability is ignored, leading to ongoing settlement removal and a continuation of the cycle.

A *status quo* therefore exists in which informal settlements remain largely unregulated, but not removed, as that requires additional investments to resettle the displaced. The response to the February 2022 flood and landslide disaster challenged this status quo, as housing policies were introduced that actually displaced people, while upholding a narrative that the right to safe housing was respected. *Moradia adequada*, following the UN's Sendai Framework (as detailed earlier), compels the state not only to provide all Brazilians with a house to live in, but also one safe from hazard (Monteiro & Veras, 2017; Santos *et al.*, 2016). In Petrópolis, we argue that the immediate post-disaster housing policies served to exacerbate spatial, economic and social vulnerabilities, while creating a discourse that these vulnerabilities were addressed. To reach this argument, we proceed with our analysis of hazard mapping and subsequent evictions, and secondly the introduction of social rent to provide landslide victims with financial assistance to help them rent an apartment.

Addressing disaster risk through hazard mapping

One of the first responses to the disaster from the side of the municipality was the creation of landslide hazard maps (termed '*mapas de risco'* in Brazil). These maps classify areas by their physical 'risk' exposure, from 'very low' to 'very high' depending on gradient, soil composition, vegetation and distance to roads, but without integrating composite social vulnerability indicators and associated socio-ecological risk factors like access and function of sanitation and drainage (Assis Dias *et al.*, 2018; Nogueira & Paiva, 2018). By qualifying

which parts of a city are most at risk, they advise policymakers on DRR measures such as containment walls or evacuation and displacement. In 2022, the creation of such maps after the destructive landslides was a first step in breaking the status quo in which *favelas* were illegal yet protected (Souza, 2015). In Petrópolis, maps classified houses around the existing landslide sites as at risk, and hence they were condemned by the *Defesa Civil*, who evicted thousands of residents from their homes. The occurrence altered perceptions of informality, granting government the authority to remove longstanding hillside occupants without land titles, despite them being thus far tolerated or encouraged as a solution to growth amidst a chronic housing shortage (Mendes Barbosa & Coates, 2021).

While thousands of people were directly displaced as their houses were destroyed in landslides, the condemnation of 'risk' areas immediately afterwards created a second wave of displacement, pushing people out of their homes even though they had survived the disaster. Thus, while the threat of homelessness from landslide susceptibility was addressed, policymakers exacerbated another problem, namely that of greater housing insecurity, via assigning a 'nature' problem as opposed to one rooted in an urbanizing society. The issue is particularly controversial as hazard risks were well known before February 2022, as expressed by one resident: "We live in a place of great danger, mountains on either side of the valley. What is on top, of course, goes down. The big problem is the slopes – water, mud – reaches the first houses, and it ends up coming down here. That's what happened. This is a problem that has been [going on for] a long time."

Furthermore, hazard maps were created various times before 2022 (Assis Dias *et al.*, 2018). A geologist informant claimed that the first maps were made in 1988, but were forgotten as political administrations changed. In 2017, a private company conducted an analysis of central Petrópolis that showed over 15,000 houses at high risk. Remarkably, this included the homes that were destroyed in 2022 in Morro da Oficina (Berta, 2022). However, no preventative action was taken in the five years leading up to the tragedy. The principle of *moradia adequada* had thus been neglected, despite information being available at the time.

Visiting the city in the days after the disaster, a geologist at the CPRM (*Companhia de Pesquisa de Recursos Minerais* – Brazil's Geological Survey) expressed shock in an interview at the 'lack of a more assertive plan' from the local authority, noting a "lack of information plans to support decision making. That was something I saw very, very, quickly. […] Because it is an event, a recurring process. Because this issue of disaster is already [part of] the history of the municipality and it seems that nothing has evolved from 2011 to 2022: 11 years. It looked the same. Anyway, this left me surprised and upset."

In combination with the neglect of earlier hazard maps, his observations emphasize a highly limited understanding of the socio-political context of environmental hazards. Despite earlier hazard maps being ignored, new ones were developed *after* the devastating 2022 landslides, presumably to prevent future harm, but in doing so imposing new vulnerability on affected people as they faced homelessness. Mapping processes, and subsequent evictions of informal residents, focused narrowly on the hazards of *external* nature, but fail to account for the reality of housing insecurity in dangerous locations. New insecurities were created by pushing people out of precarious housing where they had lived, often for decades, in a state of tolerated illegality despite clear knowledge of the present danger. Taking necessary precautions in these zones, including by addressing forest management and sanitation and drainage was conveniently avoided as such areas remained informal 'reserve' territories in a state of 'natural' risk and marginalization.

Addressing housing insecurity through social rent subsidy

Whereas the evacuation of 'risk areas' purportedly addressed the question of environmental risk, the social rent system was established to address an existing demand for housing that was worsened by the February 2022 disaster after which dangerous properties were condemned. Designed to bring informal populations into formal rental markets, social rent has for some years been used to remove people living in dangerous locations and without them resettling in another dangerous area. It achieved some rights for those needing housing by providing funds for households to rent privately, also strengthening the same urban rent market. In Brazil, state governments generally provide such financial support, and while not a disaster management policy, it has become a major component of DRR strategy, and considered an essential means to guarantee the constitutional protection of residents' rights if displacement is unavoidable. Social rent programs can be introduced or

modified in response to disaster, as occurred in 2011 when President Dilma Rousseff decreed support for RJ's highland region after disastrous floods and landslides and following pressure from the *Movimento do Aluguel social e Moradia* (Movement for Social Rent and Habitation). In 2017, unusually, the municipality of Petrópolis introduced an additional scheme.

The 2022 social rent program was a modification of, or merger with, all the preexisting schemes. In the previous system, Rio de Janeiro's State government provided a monthly social rent allowance with a value of R$500 (~US$90) transferred to the beneficiary, i.e. the renter. The subsequent municipal system in Petrópolis also covered a monthly allowance of R$500, but this was transferred directly to property owners rather than to renters. Prior to 2022, a lack of integration meant that recipients received social rent from either municipal or state levels, but not from both. The 2022 disaster led to a transformation. A representative of the *Movimento do Aluguel social e Moradia* from Petrópolis explained in an interview that the state and municipality engaged in a 'political fight', as state agencies entered the city and set up registration for social rent in state schools. Meanwhile, the municipality refused assistance from the state government although it had not yet started its own registration. During this 'political show', Governor of RJ Cláudio Castro decreed that state social rent would increase from R$500 to R$800 until December. A few weeks later, the municipality announced that it had signed contracts with homeowners to the value of R$1000 monthly (~US$180), and soon after demanded the state pay R$800 of this, which it subsequently agreed to.

Besides this, the conditions for receiving social rent also changed. Whereas income had been the primary criterion for social rent registration up to 2022, housing status became more important after the tragedy, a rule (rightly) aimed at prioritizing applicants who had lost their homes in landslides. To a lesser extent, the rule applied to those whose houses were condemned by the *Defesa Civil*. Another priority rule ensured that people of old age or with disabilities or health problems had a higher chance of entering the scheme. Since its start, families assisted by the scheme gradually increased in number from 817 in March and April to 1,270 in May and then to 3,000 by September 2022 (Ribeiro, 2022). By August, the State of RJ had invested R$4,291,200 (US$780,000).

In some ways, the *aluguel social* program can be interpreted as successful given that a great number of people had indeed moved to a safer area with its support. However, respondents did mention a great struggle to get into the system. One respondent who called it a 'fight' explained that she was refused financial support several times because she was unable to show a bank statement after being fired during the pandemic. Others pointed out that they needed to prove that they were homeowners prior to the disaster. For informal residents, this is deeply problematic as documentation of home ownership is hard to come by. The municipal government was aware of this, and was sometimes satisfied by other forms of proof such as electricity or water bills. Yet many residents had lost their documents in the disaster, meaning that the new requirement to apply for social rent in fact became a barrier to acceptance into the scheme. Becoming formal, in a sense, was refused based on the informality that it aimed to supersede.

Other applicants were refused social rent for more arbitrary reasons, and one respondent was told he was 'not living in an area of real danger', even though a mudslide happened nearby and his house was mapped within a hazard area. In other cases, homeowners had refused to rent to applicants because they brought pets or children, and other residents did not trust the municipality to pay its part of the allowance. Beyond this, state and municipal governments insisted that social rent recipients remain within state borders, despite the proximity of Petrópolis to Minas Gerais state, thus restricting peoples' ability to leave a dangerous urban environment.

While the social rent program's primary target was the low-income population, the program also faced issues over eligibility. A respondent from the *Defesa Civil* argued that the income restriction actually created *greater* segregation, stating that many people who fell outside of the qualifying income range were still unable to pay the rent by themselves. On the basis of government legal stipulations on *moradia adequada,* they were now forced from their (informal) homes within 'risk areas.' Others opted not to apply for social rent as they could not find a safer place to live that the allowance would cover, as explained by someone that chose to remain in Morro da Oficina's condemned area: "To get social rent, you need to have money. I lived with my mum in this building and don't have work as I have problems with my shoulder. They will give R$1000 (~US$180) per month to cover rent, but this is not sufficient: I cannot find a place for this amount."

In the end, the social rent system left a significant portion of residents homeless or without support. In essence, informality 'in nature' was forcefully replaced by market-quantified rights to the formal city – in agreement with ecological modernization discourse – while those unable to participate due to endemic political and socio-economic inequality were ultimately forced (back) into an even greater level of informality and vulnerability in an unstable, peripheral ecology, nominally outside the city, and now with institutional blame placed firmly onto individuals' own shoulders (Oliver-Smith 2004; Swyngedouw & Kaika, 2014). Moreover, while *aluguel social* addressed (up to a point) economic vulnerability, it did not contribute to solving the underlying issue of safe and affordable housing, and instead intensified the financialization of housing by increasing rental values and overall real estate prices in the formal city as owners 'buffered' against the social construction of disaster and informality in peripheral territories (Monteiro & Veras, 2017; Rolnik, 2019). Located in a geologically unstable region and with the city tripling in size over the course of a few decades, secure urban expansion can only be achieved by undertaking precautionary infrastructure works and other risk-reducing measures, unattainable for those demarcated as 'informal.' There is little incentive for private developers to build affordable housing for low-income citizens. Hence, even with the addition of *aluguel social*, housing remains segregated according to home ownership, affordability, and market pressure.

Under the rules applied in the months following February 2022, people even lost their rights to social rent support when they left state borders, thus restricting their ability to seek out less hazardous options. Ironically, then, it is the dependency of people on financial support for housing which disempowers them when looking for safe housing. The market logic of formal homeownership and competition for rental accommodation dictated greater land and rental speculation due to the widespread evictions, only intensifying existing problems. In this case, the social rent policy attempted to respond to the housing shortage, but in its failure to account for the spatial and ecological reality of limited safe housing in Petrópolis, it restricted peoples' ability to move elsewhere.

While *aluguel social* undoubtedly helped some residents to leave dangerous areas, its problems revolved around bureaucratic-institutional barriers that appeared arbitrary or restrictive, and that were built around logics of capitalist urbanization and internal market growth that superseded the initial focus on dangerous natures (Marks & Baird, 2025; Swyngedouw & Heynen, 2003). Hence, while *aluguel social* offered some potential in a difficult socio-spatial environment, it represented *maquiagem*, unable to avoid the pitfalls of its own discursive underpinnings. A *Defesa Civil* official, referring to impacts on inequality and the right to housing, summed this up: "maintaining a system of social rent actually hides the truth. You end up constructing a discourse that you are helping these families guarantee the right to housing. However, social rent doesn't guarantee the right to live, because when you are here, to get social rent you need to be a homeowner. So, you don't guarantee housing, you don't guarantee action, you don't guarantee the right to access social rent."

Shaping new vulnerabilities and marginalization

While the combined implementation of the two policies – one addressing disaster risk and the other focusing on the right to housing – suggests interlinkage between housing and disaster, we argue that it falls short in both areas and ended up worsening vulnerabilities.

Although landslide hazard mapping addresses the pressure of environmental or geological risk in principle, rather than being a housing policy, in practice it seriously impacts the housing security of residents who are evicted based on the mapping's claim to identify risk, while having virtually no impact on their susceptibility to new landslides. Without proper support, people eventually return to areas of landslide risk due to a lack of available housing, even when social rent support is forthcoming. Meanwhile, *aluguel social* targets the socio-economic vulnerabilities of people made homeless, which addresses housing precarity within the frame of extending housing's financialization and the strengthening of urban real estate, but excludes the political-ecological context in which safe housing is embedded. In doing so, it fails to solve the housing issue for those evicted while limiting their ability to vacate hazardous areas. Applying a political ecology lens to this situation enables analysis of the underpinning of this 'merger' of policies on disaster and housing in a discursive vision that seeks to exclude nature and peripheral precarity as somehow *pre-urban,* thus reinforcing governance based around ongoing capitalist urbanization.

In the aftermath of disaster, these policies failed to properly address the issue, eventually forcing people to return to hazardous sites. During visits to Morro da Oficina and other affected areas, respondents explained that they had returned to their original (condemned) homes, or that they had stayed put, despite the *Defesa Civil*'s eviction notice. Some stated in interviews that they lacked the means to go elsewhere, either because *aluguel social* was not sufficient or because they could not get into the system, often for seemingly arbitrary reasons. Hence, they were forced to continue living in conditions that they knew posed deep risks. In these cases, residents' conditions were usually worse than before the tragedy, as condemned areas are a low priority for restoring essential services. While repair works did take place in some of these areas, some residents explained that they now lived without electricity or clean water. One interviewee mentioned that the streets, once full and vibrant, were now empty, not only because people had left but also because it was unsafe at night without streetlights. In other places, dengue fever outbreaks happened as stagnant puddles of muddy water that worsened following the disaster had not been cleared, and hygiene was difficult to maintain. There was a ubiquitous sense of informality and vulnerability being actively produced through a framing of the urban's 'constitutive outside', with its nature politically produced and held in reserve to fortify a lucrative formal housing market amidst the imperial relics of Petrópolis.

The lack of government action in *favelas* after the disaster feeds into a general sense of neglect experienced by people living there. Residents of places such as Morro da Oficina expressed a feeling of being treated differently, as central areas of the city were restored quickly to their former beauty while the *favelas* were neglected despite suffering the most destruction. Illustrating this disparity, repair works during the fieldwork period took place along the canals and hillsides in the historical center, including the aptly nicknamed *Morro dos Milionários* (Millionaire's Hill), a street of luxury residences. Meanwhile, landslide rubble in Morro da Oficina remained months later, with no respondents hearing about plans to clear it, let alone measures implemented for future disaster prevention. All efforts made around housing rights instead revolved around condemnation, eviction, and the strengthening of an exclusionary urban land market.

Respondents in the affected area used the term *maquiagem* as we have noted (literally, 'make-up') to refer to this process in which resources are allocated to the restoration of historical and touristic areas, or wealthier city areas, rather than the most affected informal neighborhoods. In doing so, *maquiagem* preserves the city's identity as a historical site and tourist center, while obscuring the dangerous ecological reality underpinning its urbanization and housing financialization process, producing its own margins at the periphery. Caged in the language of housing rights and access, governance propagates a political-ecological narrative that the city is well taken care of, while obscuring the fate of those in the urban margins in the process.

Extending these assertions by respondents, we argue that the combination of hazard mapping and social rent – as policy discourses on urban nature as much as highly material interventions – represent *maquiagem* in a similar way. As stated by our informant from the civil defense, *aluguel social* "constructs a discourse that you are helping", while it "doesn't guarantee the right to live." The implementation of each policy creates a narrative that *moradia adequada* is guaranteed in terms of both housing availability and safety. However, as we have demonstrated, neither are realized. Instead, such policies exacerbated the vulnerabilities of residents excluded from their benefits, thus feeding into a sense of neglect. In the end, the condemnation of risk areas and redefinition of the social rent system are a merger of housing policy and DRR within the increasingly tense ongoing reality of capitalist urbanization, discursively supporting the constitutional principle of *moradia adequada* while concealing disaster risk creation through reinforcement of the in/formal divide and allowing the cycle of disaster to continue.

6. Discussion

We have drawn on informants' use of the term *maquiagem* to explain how, under intertwined environmental crises, policies on housing and on disaster risk have merged to (further) conceal the reality of capitalist urbanization's embeddedness in socio-ecological degradation. We have used an urban political ecology framework to analyze this merger of two hitherto separate policy domains – one associated with socio-economic and political realities *without* nature and the other in technical understandings of a natural world *without* politics. Rather than a meaningful *rapprochement*, however, we argue that the rights-focused language

of struggle for safe habitation has been reappropriated into capitalist urbanization by discursively constructing nature as marginal and informal, creating a buffer against which housing financialization can advance. Rooted in the racialized history of Brazil's colonial and imperial development, *maquiagem* demonstrates the concealment of disaster risk creation through the purported risk reduction activity of formalizing marginalization and vulnerability. Yet in an urban periphery discursively constructed as 'pre-urban' for a long time, or as localities to be lifted *out* of nature, the policy effect is actually to reproduce (in)formal dichotomies that enable more market competition for urban space and hence value creation.

We also hope to have demonstrated the need to analyze housing and disaster risk policies in conjunction. Neat demarcations of 'disaster risk' (or 'natural hazard'), and 'housing policy' tend to reinforce those nature-society binaries which become untenable in the context of urban development that includes and excludes different neighborhoods and populations according to land and citizenship rights, market values, and urban expansions that impact upon socio-ecological relations at urban fringes. Hazard mapping aims to address environmental safety, but creates deep social problems around housing access and security. Social rent is conversely supposed to counter such shortcomings, yet fails to account for the production of hazardous areas and hence the spatial 'natures' of the society it aims to impact upon.

While the condemnation of risk areas in Petrópolis leaves people with fewer resources and legal insecurity, social rent policies – at least through the period of this research – failed to guarantee the right to housing while simultaneously asserting that the principle of *moradia adequada* is upheld. The reality, however, is that people were forcibly displaced and refused government support, and once again settled informally in locations made hazardous and vulnerable by their consistent labelling as informal and outside the city. Housing policy in the wake of the 2022 disaster created an image of inclusive citizenship, yet obscured the fact that many people found themselves in worse circumstances than before. Unequal citizenship proliferates through the dual approach of enabling or tolerating settlement in dangerous areas as a housing solution for urban expansion, while continuously neglecting *favelas* and the requisite safety infrastructures (and potentially warnings) for those areas that would make them safer. This urban governance approach produces hazards via flows of water and sediment through erosion and run-off, in conjunction with climatic events, and was followed by *ex post* hazard mapping and condemnation of neighborhoods without provision of realistic alternative residences. Those who remain in condemned parts of Petrópolis today not only suffer from the effects of disaster, but also from deeper informality and exclusion. Those returning to the same hazardous areas live with fewer resources and services, in poorer conditions than before and with greater landslide risks.

7. Conclusion

Dominant DRR paradigms such as the Sendai Framework emphasize the key role of housing in disaster prevention. While disaster vulnerability is underpinned by housing inequalities – as the political ecology of disaster has outlined for decades – our analysis extends urban political ecology's engagement with the urban's 'constitutive outside' in the form of 'natural hazard' discourses, used by urban governance to define and reproduce housing informality as a buffer to reinforce capitalist value creation in the formal city. This occurs until such time as peripheral areas are made safe and officially 'urbanized' as cohesive parts of the city that can be traded in real estate markets. We theorize the case of Petrópolis as an intensification and merger of housing and disaster risk policies designed to conceal disaster risk creation through their stated progressive effort to address intertwined environmental crises. Powerful actors in urban governance mobilize discourses of risk and nature within wider discourses of progress in urban socio-spatial relations.

What then of the practices of resistance and survival used by those at the urban margins? In a sense, our informants' use of the term *maquiagem* indicates a level of knowledge and critical analysis on urban governance that then informs their own practice in achieving better personal and communitarian outcomes. Neglected citizens use their own initiative by resettling in *favelas* in vulnerable locations, circumnavigating the formal city and its urge to commodify housing. We can only speculate on how this knowledge and practice plays out in people's social and political behavior, not least at the ballot box. But it is also important not to idealize life in urban peripheries, where unstable infrastructural ecologies accompany unstable livelihoods, service access, and unequal citizenship. What is more important is to understand how deeply 'nature' is embroiled in such

political struggles over urban society and space. In an era of intertwined crises over capitalist modernization, related changes in, and manipulations of discourse over, the environment, nature and risk – in both policy construction and social movement mobilization – are central to urban governance. For the 'right to the city', it is no longer possible to imagine an urban without nature. Taking socio-political realities seriously in ecological discussions on urban hazards and risk, and working through the problem of the 'constitutive outside', tries to theoretically and practically transform the way society and science thinks about nature and the city. Similarly, where housing policies like social rent appropriate the discourse of equality and progressivism while simultaneously externalizing 'natural hazards' as objective threats, resistance may depend on more effectively calling out the causes of, and background to, urban socio-environmental problems. This needs to be done in terms of the management of flows of material between the built and unbuilt environment, and the construction of discourses that attempt to reflect and contain these flows.

References

Absell, C. D. (2020). The rise of coffee in the Brazilian south-east: Tariffs and foreign market potential, 1827–40. *The Economic History Review*, 73(4), 964–990. https://doi.org/10.1111/ehr.12966

Ambrozio, J. C. G. (2012). O território da enfiteuse e a cidade de Petrópolis—RJ, Brasil. *Revista Electrónica de Geografía y Ciencias Sociales*, 16. Retrieved June 9, 2025 from https://revistes.ub.edu/index.php/ScriptaNova/article/view/14837

Anguelovski, I., Irazábal-Zurita, C., & Connolly, J. J. T. (2019). Grabbed urban landscapes: Socio-spatial tensions in green infrastructure planning in Medellín. *International Journal of Urban and Regional Research*, 43(1), 133–156. https://doi.org/10.1111/1468-2427.12725

Assis Dias, M. C. D., Saito, S. M., Alvalá, R. C. D. S., Stenner, C., Pinho, G., Nobre, C. A., … Corrêa, C. de O. (2018). Estimation of exposed population to landslides and floods risk areas in Brazil, on an intra-urban scale. *International Journal of Disaster Risk Reduction*, 31, 449–459. https://doi.org/10.1016/j.ijdrr.2018.06.002

Ávila, A., Justino, F., Wilson, A., Bromwich, D., & Amorim, M. (2016). Recent precipitation trends, flash floods and landslides in southern Brazil. *Environmental Research Letters*, 11(11), 114029. https://doi.org/10.1088/1748-9326/11/11/114029

Berta, R. (n.d.). Petrópolis sabia de 15 mil imóveis em risco na área da tragédia desde 2017. Retrieved February 17, 2022, from https://noticias.uol.com.br/cotidiano/ultimas-noticias/2022/02/17/petropolis-sabia-de-15-mil-imoveis-em-risco-na-area-da-tragedia-desde-2017.htm

Bittencourt, B. K., Cannabrava, M. P., Del Rosario, T. K., Hamilton, M. C., Kampmann, M. E., McGrath, J. T. & Lambert, J. H. (2013). Evaluating preparedness and resilience initiatives for distressed populations vulnerable to disasters in Rio de Janeiro, Brazil. 2013 *IEEE Systems and Information Engineering Design Symposium*. (pp. 58–63). IEEE. https://doi.org/10.1109/SIEDS.2013.6549494

Bodo, T. (2019). Rapid urbanisation: Theories, causes, consequences and coping strategies. *Annals of Geographical Studies*, 2(3), 32–45. https://doi.org/10.22259/2642-9136.0203005

Carraro, V., Visconti, C., & Inzunza, S. (2021). Neoliberal urbanism and disaster vulnerability on the Chilean central coast. *Geoforum*, 121, 83–92. https://doi.org/10.1016/j.geoforum.2021.02.023

Cavalcante, J. L. (2005). A Lei de Terras de 1850 e a reafirmação do poder básico do Estado sobre a terra. *Histórica*, (2), 1–8.

Cendrero, A., Forte, L. M., Remondo, J., & Cuesta-Albertos, J. A. (2020). Anthropocene geomorphic change: Climate or human activities? *Earth's Future*, 8(5), e2019EF001305. https://doi.org/10.1029/2019EF001305

Cerri, R. I., Rosolen, V., Reis, F. A. G. V., Filho, A. J. P., Vemado, F., Do Carmo Giordano, L., & Gabelini, B. M. (2020). The assessment of soil chemical, physical, and structural properties as landslide predisposing factors in the Serra do Mar mountain range (Caraguatatuba, Brazil). *Bulletin of Engineering Geology and the Environment*, 79(7), 3307–3320. https://doi.org/10.1007/s10064-020-01791-1

Chmutina, K., & Von Meding, J. (2022). Towards a liberatory pedagogy of disaster risk reduction among built environment educators. *Disaster Prevention and Management: An International Journal*, 31(5), 521–535. https://doi.org/10.1108/DPM-02-2022-0041

Coates, R. (2019). Citizenship-in-nature? Exploring hazardous urbanization in Nova Friburgo, Brazil. *Geoforum*, 99, 63–73. https://doi.org/10.1016/j.geoforum.2018.12.001

Coates, R., & Nygren, A. (2020). Urban floods, clientelism, and the political ecology of the state in Latin America. *Annals of the American Association of Geographers*, 110(5), 1301–1317. https://doi.org/10.1080/24694452.2019.1701977

Coelho Netto, A. L. (2005). A interface florestal-urbana e os desastres naturais relacionados à água no maciço da tijuca: desafios ao planejamento urbano numa perspectiva sócio-ambiental. *Revista do Departamento De Geografia, University of São Paulo*. 16, 46–60. https://doi.org/10.7154/RDG.2005.0016.0005

Coelho Netto, A. L., Fernandes, M., Nunes, F., Bertassoni, G., Bolsas, L., Facadio, A. C., … Moreno, L. (2022, June 20). The most recent disaster related to extreme rainfall induced landslides and floods: Petropolis, Rio de Janeiro state, SE-Brazil. *10th International Conference on Geomorphology*. https://doi.org/10.5194/icg2022-628

Collins, T. W. (2009). The production of unequal risk in hazardscapes: An explanatory frame applied to disaster at the US–Mexico border. *Geoforum*, 40(4), 589–601. https://doi.org/10.1016/j.geoforum.2009.04.009

Comerio, M. C. (1997). Housing issues after disasters. *Journal of Contingencies and Crisis Management*, 5(3), 166–178. https://doi.org/10.1111/1468-5973.00052

Cronon, W. (1992). *Nature's metropolis: Chicago and the Great West*. Norton.

Da Costa, K., & Pospieszna, P. (2016). Can laws and policies foster disaster risk reduction? The case study of Brazil, with particular focus on housing laws, policies, and programs. In A. Awotona (Ed.), *Planning for community-based disaster resilience worldwide: Learning from case studies in six continents* (pp. 171–183). Routledge. https://doi.org/10.4324/9781315600734

da Fonseca, P. H. (2011). A enfiteuse e função social do solo urbano: A regularização local e popular. *Publica Direito*, 1717–1741. http://www.publicadireito.com.br/conpedi/manaus/arquivos/anais/bh/paulo_henriques_da_fonseca.pdf

Da Silva, A. S., Guerra, A. J. T., Polivanov, H., & Fullen, M. A. (2016). Soil structural indicators of hillslope destabilization in the Serra do Mar mountain range (Rio de Janeiro State, Brazil). *Natural Hazards*, 81(2), 1177–1191. https://doi.org/10.1007/s11069-015-2126-7

Da Silva Cabral, L. M., & Lopes, R. A. A. (2016). A industrialização têxtil de Petrópolis: Um estudo de caso sobre Cia Petropolitana. *Intervozes: Trabalho, Saúde, Cultura*, 1(1), 6–23. Retrieved May 08, 2024 from https://www.fmpfase.edu.br/intervozes/content/pdf/edicao/intervozes_01_vol_01.pdf

Davis, M. (1999). *Ecology of fear: Los Angeles and the imagination of disaster*. Vintage Books.

Dean, W. (1995). *With broadax and firebrand: The destruction of the Brazilian Atlantic Forest*. University of California.

Dos Santos, D. F., Laeta, T., Fernandes, M. D. C., & Sousa, G. M. D. (2017). Manutenção da planta Koeler para digitalização através de levantamento fotográfico [Digitalization of the Koeler plan through photographic preservation]. *Revista Brasileira de Geomática*, 5(2), 277. https://doi.org/10.3895/rbgeo.v5n2.5424

Fernandes, M. D. C., Laeta, T., Dos Santos, D. F., & De Menezes, P. M. L. (2017). Cartographic memory preservation of Petrópolis city in Brazil: Koeler map scanning using photographic survey. In M. P. Peterson (Ed.), *Advances in Cartography and GIScience.* (pp. 3–19). Springer. https://doi.org/10.1007/978-3-319-57336-6_1

Ferreira, A. (2009). Favelas no Rio de Janeiro: nascimento, expansão, remoção e, agora, exclusão através de muros. *Revista Bibliográfica de Geografía y Ciencias Sociales*, 14(828), 1–3. Retrieved June 9, 2025, from https://www.ub.edu/geocrit/b3w-828.htm

Finch, C., Emrich, C. T., & Cutter, S. L. (2010). Disaster disparities and differential recovery in New Orleans. *Population and Environment*, 31(4), 179–202. https://doi.org/10.1007/s11111-009-0099-8

Fix, M., & Arantes, P. F. (2022). On urban studies in Brazil: The favela, uneven urbanisation and beyond. *Urban Studies*, 59(5), 893–916. https://doi.org/10.1177/0042098021993360

Froude, M. J., & Petley, D. N. (2018). Global fatal landslide occurrence from 2004 to 2016. *Natural Hazards and Earth System Sciences*, 18(8), 2161–2181. https://doi.org/10.5194/nhess-18-2161-2018

Gandy, M. (2006). Urban nature and the ecological imaginary. In N. C. Heynen, M. Kaika, & E. Swyngedouw (Eds.), *In the nature of cities: Urban political ecology and the politics of urban metabolism*. Routledge.

Gould, K. A., Garcia, M. M., & Remes, J. A. C. (2016). Beyond "natural-disasters-are-not-natural": The work of state and nature after the 2010 earthquake in Chile. *Journal of Political Ecology*, 23(1), 93. https://doi.org/10.2458/v23i1.20181

Guerra, A., Oliveira, A. C., Lopes Oliveira, F., & Gonçalves, L. F. H. (2007). Mass movements in Petrópolis, Brazil. *Geography Review*, 20, 34–37.

Kaika, M., Keil, R., Mandler, T., & Tzaninis, Y. (Eds.). (2023). *Turning up the heat: Urban political ecology for a climate emergency*. Manchester University Press.

Karvonen, A. (2011). *Politics of urban runoff: Nature, technology, and the sustainable city.* MIT Press. https://doi.org/10.7551/mitpress/8953.001.0001

Laclau, E., & Mouffe, C. (1993). *Hegemony and socialist strategy: Towards a radical democratic politics*. Verso.

Lefebvre, H. (2013). *The production of space* (D. Nicholson-Smith, Ed.). Blackwell.

Lewis, J., & Kelman, I. (2012). The good, the bad and the ugly: Disaster risk reduction (DRR) versus disaster risk creation (DRC). *PLoS Currents*, 4, e4f8d4eaec6af8. https://doi.org/10.1371/4f8d4eaec6af8

Lima, V. (2018). Social housing under the Workers' Party government: An analysis of the private sector in Brazil. *Third World Quarterly*, 39(8), 1640–1655. https://doi.org/10.1080/01436597.2017.1408406

Lizzaralde, G., & Davidson, C. (2007). Learning from the poor. In D. Alexander, C. H. Davidson, A. Fox, C. Johnson, & G. Lizzaralde (Eds.), *Post-disaster reconstruction: Meeting stakeholder interests: Proceedings of a conference held at the Scuola di Sanità Militare, Florence, Italy 17-19 May 2006* (pp. 393–403). Firenze University Press. https://doi.org/10.36253/978-88-8453-611-2

Machado, R. A. S., Oliveira, A. G., & Lois-González, R. C. (2019). Urban ecological infrastructure: The importance of vegetation cover in the control of floods and landslides in Salvador / Bahia, Brazil. *Land Use Policy*, 89, 104180. https://doi.org/10.1016/j.landusepol.2019.104180

Marchezini, V. (2015). The biopolitics of disaster: Power, discourses, and practices. *Human Organization*, 74(4), 362–371. https://doi.org/10.17730/0018-7259-74.4.362

Maricato, E. (2003). Metrópole, legislação e desigualdade. *Estudos Avançados*, 17(48), 151–166. https://doi.org/10.1590/S0103-40142003000200013

Marks, D., & Baird, I. G. (2025). The urban political ecology of worsening flooding in Phnom Penh, Cambodia: Neopatrimonialism, displacement, and uneven harm. *International Journal of Disaster Risk Reduction*, 118, 105229. https://doi.org/10.1016/j.ijdrr.2025.105229

Mendes Barbosa, L., & Coates, R. (2021). Resisting disaster chronopolitics: Favelas and forced displacement in Rio de Janeiro, Brazil. *International Journal of Disaster Risk Reduction*, 63, 102447. https://doi.org/10.1016/j.ijdrr.2021.102447

Mendes Barbosa, L., & Walker, G. (2020). Epistemic injustice, risk mapping and climatic events: analysing epistemic resistance in the context of favela removal in Rio de Janeiro. *Geographica Helvetica*, 75(4), 381–391. https://doi.org/10.5194/gh-75-381-2020

Millington, N. (2018). Linear parks and the political ecologies of permeability: Environmental displacement in São Paulo, Brazil. *International Journal of Urban and Regional Research*, 42(5), 864–881. https://doi.org/10.1111/1468-2427.12657

Millington, N. (2021). Stormwater politics: flooding, infrastructure, and urban political ecology in São Paulo, Brazil. *Water Alternatives*, 14(3), 866–885. https://www.water-alternatives.org/index.php/alldoc/articles/vol14/v14issue3/648-a14-3-11/file

Monteiro, A. R., & Veras, A. T. D. R. (2017). The housing issue in Brazil. *Mercator*, 16(7), 1–12. See: https://www.scielo.br/j/mercator/a/ZkVrVHZqbHWQwK6HRpGrcXN/?lang=en&format=pdf

Muir, G., & Opdyke, A. (2024). Deconstructing disaster risk creation discourses. *International Journal of Disaster Risk Reduction*, 111, 104682. https://doi.org/10.1016/j.ijdrr.2024.104682

Nehren, U., Kirchner, A., Sattler, D., Turetta, A. P., & Heinrich, J. (2013). Impact of natural climate change and historical land use on landscape development in the Atlantic Forest of Rio de Janeiro, Brazil. *Anais Da Academia Brasileira de Ciências*, 85(2), 497–518. https://doi.org/10.1590/S0001-37652013000200004

Nogueira, F. R., & Paiva, C. F. E. D. (2018). Contribuição ao tratamento de riscos em urbanização de assentamentos precários. *Oculum Ensaios*, 15(3), 437–454. https://doi.org/10.24220/2318-0919v15e2018a4182

Nogueira, F. R., & Souza, B. R. M. (2020). O mito da remoção como alternativa para a eliminação dos riscos. *Diálogos Socioambientais*, 3(8), 24–26. https://periodicos.ufabc.edu.br/index.php/dialogossocioambientais/article/view/352

Oliver-Smith, A. (2004). Theorizing vulnerability in a globalized world: A political ecology perspective. In G. Bankoff, G. Frerks, & T. Hilhorst (Eds.), *Mapping vulnerability: Disasters, development, and people* (pp. 10–24). Earthscan.

Oliver-Smith, A., Alcántara-Ayala, I., Burton, I., & Lavell, A. (2017). The social construction of disaster risk: seeking root causes. *International Journal of Disaster Risk Reduction*, 22, 469–474. https://doi.org/10.1016/j.ijdrr.2016.10.006

Peacock, W. G., Van Zandt, S., Zhang, Y., & Highfield, W. E. (2014). Inequities in long-term housing recovery after disasters. *Journal of the American Planning Associatio*n, 80(4), 356–371. https://doi.org/10.1080/01944363.2014.980440

Pino, J. C. (1997). Sources on the history of favelas in Rio de Janeiro. *Latin American Research Review*, 32(3), 111–122. http://doi.org/10.1017/S0023879100038061

Platonow, V. (2022, March 22). Petrópolis registrou 250 deslizamentos em 24 horas por causa da chuva. *Agência Brasil*. Retrieved June 9, 2025, from https://agenciabrasil.ebc.com.br/geral/noticia/2022-03/petropolis-registrou-250-deslizamentos-em-24-horas-por-causa-da-chuva

Pomaroli, M. I. S. (2022). Moradias irregulares em áreas de enfiteuse. *Revista de Direito Notarial*, 4(1). Retrieved June 9, 2025, from https://ojs-rdn.galoa.net.br/index.php/direitonotarial/article/download/56/40

Rabaço, H. José. (1985). *História de Petrópolis: Antecedentes históricos e a povoação*. Instituto Histórico de Petrópolis.

Rasch, R. (2017). Income inequality and urban vulnerability to flood hazard in Brazil. *Social Science Quarterly*, 98(1), 299–325. https://doi.org/10.1111/ssqu.12274

Ribeiro, J. (2022). Mais de 3 mil famílias receberão aluguel social no início de setembro. *Diário de Petrópolis*. Retrieved January 13, 2023, from https://www.diariodepetropolis.com.br/integra/mais-de-3-mil-familias-receberao-aluguel-social-no-inicio-de-setembro-216019

Rolnik, R. (2019). *Urban warfare: Housing under the empire of finance* (F. Hirschhorn, Trans.). Verso.

Roy, A. (2016). What is urban about critical urban theory? *Urban Geography*, 37(6), 810–823. https://doi.org/10.1080/02723638.2015.1105485

Santos, A. M. S. P., Medeiros, M. G. P., & Luft, R. M. (2016). *Direito à moradia: um direito social em construção no Brasil: a experiência do aluguel social no Rio de Janeiro*. Retrieved June 9, 2025, from https://repositorio.ipea.gov.br/bitstream/11058/6575/1/ppp_n46_direito_moradia.pdf

Schuster, R. L., & Highland, L. M. (2007). The third Hans Cloos lecture. Urban landslides: socioeconomic impacts and overview of mitigative strategies. *Bulletin of Engineering Geology and the Environment*, 66(1), 1–27. https://doi.org/10.1007/s10064-006-0080-z

Siddiqi, A. (2022). Disaster studies and its discontents. In G. Bankoff & D. Hilhorst (eds.), *Why vulnerability still matters.* (pp. 91–106). Routledge. https://doi.org/10.4324/9781003219453-8

Smith, N. (2006). There's no such thing as a natural disaster. Retrieved April 2, 2022, from *Items*: https://items.ssrc.org/understanding-katrina/theres-no-such-thing-as-a-natural-disaster/

Smith, N. (2010[1984]). *Uneven development: Nature, capital, and the production of space*. Verso.

Souza, M. L. D. (2015). Proteção ambiental para quem? A instrumentalização da ecologia contra o direito à moradia. *Mercator*, 14(4), 25–44.

Swyngedouw, E., & Heynen, N. C. (2003). Urban political ecology, justice and the politics of scale. *Antipode*, 35(5), 898–918. https://doi.org/10.1111/j.1467-8330.2003.00364.x

Swyngedouw, E., & Kaika, M. (2014). L'ecologia política urbana. Grans promeses, aturades. i nous inicis?. *Documents d'Anàlisi Geogràfica*, *60*(3), 459–481. https://doi.org/10.5565/rev/dag.155

Talbot, J., Poleacovschi, C., Hamideh, S., & Santos-Rivera, C. (2020). Informality in postdisaster reconstruction: The role of social capital in reconstruction management in post–Hurricane Maria Puerto Rico. *Journal of Management in Engineering*, 36(6), 04020074. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000833

Telles, V. da S. (2015). Cidade: Produção de espaços, formas de controle e conflitos. *Revista de Ciências Sociais*, 46(1), 15–41. https://periodicos.ufc.br/revcienso/article/view/2423

Tumini, I., & Poletti, A. (2019). Natural disaster and informality (re)production in Chile. *City, Culture and Society*, 19, 100312. https://doi.org/10.1016/j.ccs.2019.100312

Twigg, J. (2002). *Technology,* post-disaster housing reconstruction and livelihood security. Benfield Hazard Research Centre, *Disaster Studies Working Paper* 15, Retrieved June 9, 2025, from https://doi.org/10.13140/RG.2.2.25469.59367

UNDRR. (2015, June 29). *Sendai framework for disaster risk reduction 2015-2030*. UNDRR. Retrieved May 09, 2025, from https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

UNDRR. (2025, November 28). *No natural disasters*. Retrieved February 13, 2025, from https://www.undrr.org/our-impact/campaigns/no-natural-disasters

World Bank. (2012). *Avaliação de perdas e danos: Inundações e deslizamentos na Região Serrana do Rio de Janeiro de 2011*. World Bank. Retrieved June 9, 2025, from https://documents1.worldbank.org/curated/en/260891468222895493/pdf/NonAsciiFileName0.pdf

Zeiderman, A. (2012). On shaky ground: The making of risk in Bogotá. *Environment and Planning A*, 44(7), 1570–1588. https://doi.org/10.1068/a44283

Zhang, X. Q. (2016). The trends, promises and challenges of urbanisation in the world. *Habitat International*, 54, 241–252. https://doi.org/10.1016/j.habitatint.2015.11.018

Zimmer, A. (2010). Urban political ecology. theoretical concepts, challenges, and suggested future directions. *ERDKUNDE*, 64(4), 343–354. https://doi.org/10.3112/erdkunde.2010.04.04