Climate Captivity: When in-situ Adaptation and Moving Out Are No Longer Options

Samuel Rufat, Christian Kuhlicke

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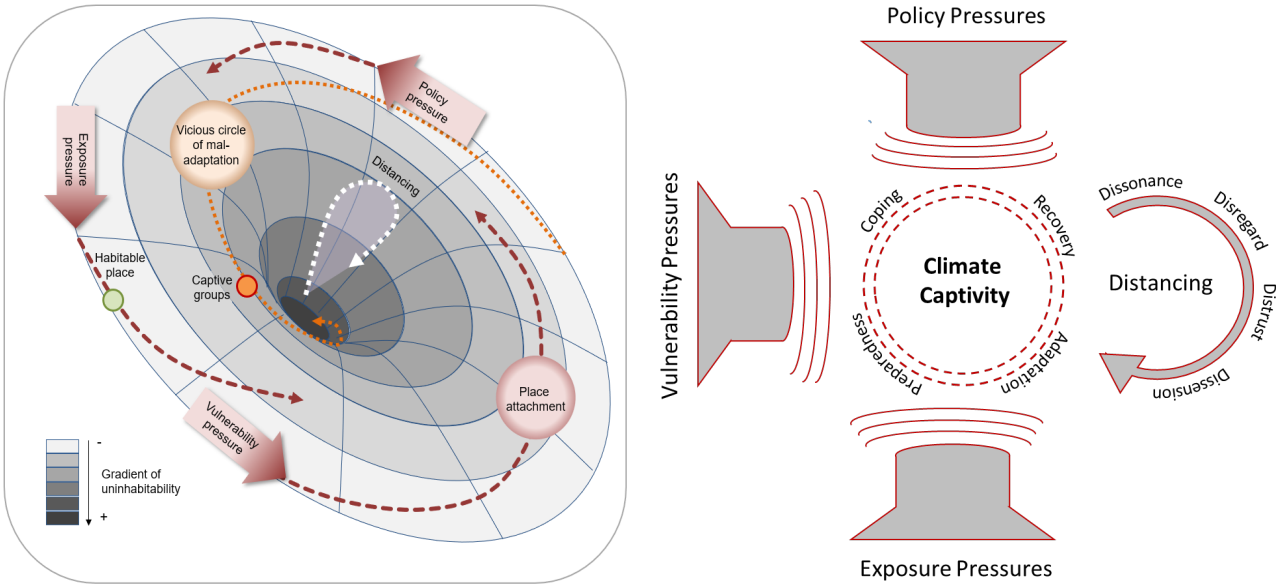

Rufat, S., & Kuhlicke, C. (2025). Climate Captivity: When in-situ Adaptation and Moving Out Are No Longer Options. *Progress in Environmental Geography*, https://doi.org/10.1177/27539687251378494

Abstract

The term captivity describes the condition in which people face increasing exposure to human-made climate disruptions or disaster risks without effective means to mitigate these impacts—whether through *in situ* adaptation, mobility, or migration. Captivity offers an alternative to terms such as immobility or trapped, shifting the focus toward the root causes of why people remain in potentially uninhabitable places. This article establishes captivity as an analytical framework to examine the diverse reasons and consequences of prolonged environmental risk exposure. It also challenges the implicit assumption in climate migration and adaptation research that affected individuals are responsible for not leaving sooner or making the "right" choices. Rather than ceasing their efforts to adapt or relocate, captive individuals often experience repeated failures in their attempts to reduce vulnerability, leading to maladaptation over time. Although empirical findings remain fragmented across different fields and are frequently marginalized through the uncritical deployment of terminology, the outward projection of threats, whether by displacing risk spatially, temporally, or cognitively, may constitute the sole remaining coping mechanism as environments become progressively uninhabitable. By conceptualizing captivity, we aim to deepen understanding of the lived experiences, decision-making processes, and daily struggles of those caught in worsening environmental conditions.

Keywords

Climate change adaptation; disaster risk reduction; captivity; social vulnerability; risk perception; maladaptation

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1. Introduction

Captivity describes the condition of people for whom neither effective *in-situ* adaptation nor residential mobility or migration is feasible to mitigate the impacts of disasters and climate change. As a result, people are caught in exposed environments. Although the term "captivity" has been used in different fields of research, in our understanding, it has not been conceptualized in relation to climate change. We therefore develop the concept of captivity to better understand the social consequences of climate change and how they affect highly exposed and vulnerable people.

The growth rates of people residing in high-risk areas are outperforming growth rates in protected or less-exposed regions (Modaresi Rad et al. 2023; Rentschler et al. 2023). Therefore, the number of people affected by disasters and remaining in exposed areas far exceeds those who temporarily or permanently migrate (Black et al. 2013). However, migration and mobility have been an ascendant research strand in adaptation to the global environmental crisis, suggesting that as climate change worsens, mass migration would become a dominant global pattern (McLeman and Smit 2006; Tacoli 2009; Warner et al. 2010). This "mobility bias" (Schewel 2020) all too often reproduces "climate migration myths" and frames migration as a "looming security crisis" (Boas et al. 2019). Similarly, research on in-situ adaptation rather uncritically accepts central assumptions underlying a behavioral turn in climate-related risk management, attributing responsibility to individuals (Kuhlicke et al. 2020b; Kuhlicke et al. 2023) instead of engaging more deeply with questions of equity, capacities, and resources (Rufat et al. 2020), as well as limits of individual adaptation in the face of worsening climate change (Aerts et al. 2024).

This paper aims to advance a perspective that focus on people for whom mobility or adaptation are no feasible options, thus leaving them in highly exposed and vulnerable situations. Our argument builds upon empirical findings dispersed across different fields and often occupying a peripheral role. To provide some examples, within migration research, the discursive figure of "trapped populations" has emerged (FMGEC, 2011; Noy, 2017). This perspective unravels the processes, structures and personal decisions that hold people back from migrating (Schewel, 2020) and relies on term such as "staying" (Pemberton et al., 2021) or "immobility" (Black et al., 2013). A number of reasons have been put forward to explain why people are caught in such situations, including a lack of financial resources (Nawrotzki and DeWaard, 2018), place attachment (Blondin, 2021), or the perspective of *in-situ* adaptation (Duijndam, 2024; Hauer et al., 2020). Although less prevalent, other factors have been put forward as holding people back from migrating, including social norms and gender roles (Ayeb-Karlsson, 2020a, 2020b), social ties and community commitment (Tinoco, 2023), mental health and depression (Ayeb-Karlsson et al., 2020), risk aversion and/or perceived uncertainty about the benefits of moving (Schewel, 2020). Sometimes, when only part of a group moves and some family member are left behind, it has been suggested that this might be an attempt at risk spreading and creating mutual insurances (Stange et al., 2023).

Research on social vulnerability to disasters and climate change impacts also resorts to the figure of trapped populations, particularly since hurricane Katrina (Colten, 2006). Poor people tend to more often settle in more exposed areas (Rufat 2015), such as flood plains for steep hill slopes (Adams, 2016; Chan, 1995; Lall and Deichmann, 2010) and are therefore more often affected by natural hazards (Hallegatte et al., 2020). One of the drivers underlying this dominant pattern is "socio-economic sorting" (McCaughey et al. 2018), as dropping prices in more exposed areas and outmigration are leaving behind the less affluent people (Musterd and Ronald 2007; Bernelius and Vilkama 2019). This is partly derived from segregation studies, as in the Chicago's School model, minorities' exclusion from residing in 'desirable' areas stems from facing more external constraints in their work and housing trajectories (Park, Burgess, 1967). As a result, the poorest are relegated in degraded environments (Bunge, 1971). In parallel, the "poverty trap" (Hallegatte et al., 2016) has

percolated from development studies into a series of “traps” suggesting self-reinforcing mechanisms widening income inequality, often without a spatial dimension (Cappelli et al.2021).

While different fields of research have been using terms such as trapped, left behind or immobility, in all their diversity, studies are characterized by a set of striking commonalities. First, key terms (e.g., trapped) are often used metaphorically resulting in a lack of consistent operationalisation (Ayeb-Karlsson et al., 2022). A second ambiguity arises from underlying implicit normative framings, in migration and climate adaptation rather than in disaster risk or segregation studies. While some studies regard lacking (financial) resources as a key factor hampering people to move out of harm’s way (Nawrotzki and DeWaard, 2018), others understand trapped populations as rather passive, or see the mismatch between intention to migrate and lacking resources to realise this intention as a decisive characteristic of trapped populations (DeWaard et al., 2022). Third, key terms are often used uncritically. Terms such as “trapped”, “stuck” or “immobility” suggest that people are passive and would have no “agency, autonomy, and independence in determining their own destiny” (Ayeb-Karlsson et al., 2018, 570), pathologising people who might deliberately decide to stay (Anderson, 2016). Therefore, alternative terms such as “voluntary immobility” (Blondin, 2021), “acquiescent immobility (Schewel, 2020) or “ambivalent immobility” (Transiskus and Bazarbash, 2024) have been proposed to highlight the complex and often contradictory weighing and decision-making processes individuals are going through. However, supplementing ambiguous terms by non-consensual qualifiers is only further obfuscating the overall loose use of term and contributes to the fragmentation of the research landscape, instead of overcoming the conceptual blindspots. This situation is hampering disciplinary cross-perspectives. Similar as in other interdisciplinary fields of research (Kuhlicke et al., 2023), the empirical insights remain rather fragmented and do not allow for case-study comparison across spatial and temporal scales to reveal the bigger picture.

To overcome some of the shortcoming just outlined and for systematically exploring the various reasons and consequences of being caught in hazardous situations, we advocate for a view that works around the “mobility fetishism” (Canzler et al., 2016) as well as the behavioural turn in disaster risk management behind by putting the concept of captivity at the core of the analysis. We introduce climate captivity as a counter-narrative to the supposed social inertia (e.g., people are not abiding to the injunctions, not following risk communication, etc.), leading to a critical reframing of the individualistic perspective on maladaptation and its vicious circle. Maladaptation refers to actions aiming at adaptation but turning out to be counter-productive and leading to an increase in vulnerability instead (Schipper 2020), often accidentality over time (Magnan et al., 2016). We argue that climate captivity offers a shift in perspective, to attend to the root causes rather than blaming individual behaviour failures.

We expect that climate captives will primarily be found in areas that are increasingly impacted by extreme events, including areas not yet considered as exposed to hazards. These areas can also be understood as places that will increasingly become uninhabitable. However, habitability is not uniform for a given place, varying across social, economic, physical and mental abilities, while perceived (in)habitability is dependent on place attachment, mobility, connections to distant places across scales and networks or the relative habitability in neighbouring places (Sterly et al. 2024). In turn, captivity also offers an analytical lens on the strategies for coping with being held captive that goes beyond physical exposure, but also includes vulnerability drivers as well as policy processes. Our goal is to outline the contours of a broad-scale scientific collaboration, where scholars from diverse regions, studying various hazards and disasters, employing different theories and concepts, initiate an active and systematic discourse across intellectual domains and boundaries concerning the diverse reasons and consequences of being caught in environmental risk exposure, including different ways of distancing from such exposures. By doing so we aim to

advance the discussion by moving beyond the dominant case study perspective as well as the current framings and outline a research perspective that understands people being caught not just as a discursive figure (Ayeb-Karlsson et al. 2018), but rather as a *"mode of living that constitutes practices and affects"* (O'Neill and Dua, 2018: 6).

2. Climate captivity as a counter-narrative and analytical lens

The term "captive" as defined by the Oxford English Dictionary refers to *"a person taken prisoner, in war, or by brigands or savages; one taken and held in confinement"*. However, captivity should not be restricted to physical confinement. The "captive audience" doctrine of the US Supreme Court (1948), for instance, acknowledges that the unwilling listener is helpless to escape the message without the protection from the authorities (Strauss, 1991). As a consequence, such captive audiences have to be protected by spatial (e.g., prohibiting certain activities in specific neighbourhoods) and temporal restrictions (e.g., employers are not allowed to give discouraging speeches before union meetings). Furthermore, captivity needs also to be understood from the perspective of people themselves. Interviews with people living in dilapidated social housing have prompted the explicit use of "captive" and "captivity" to report how people need to navigate the contradictions between external stigmatisation and internal place attachment: *"Seen from the inside, housing is full of relationships, memories and achievements, and not just a place of relegation and captivity from which people are desperate to escape. Case by case, interview by interview, the researcher retraces their life stories to give the stigmatized inhabitants a voice (…) Listening to them all talk about their lives, doubts creep in: who is a captive, who is no longer? Where does exclusion end and place attachment begin?"* (Foret, 1987: 19; translation SR). In these instances, captivity is far more dynamic and complex than mere physical confinement. Instead, it often involves a complex web of psychological, economic, political, cultural, and geographical factors. The aforementioned grievances have led Bourdieu to highlight: *"Capital makes it possible to keep undesirable people and things at a distance (...) The lack of capital chains you to a place (...) Poverty means not being able to escape from where you live, being a captive of your home, your neighbourhood, your environment. Poverty is literally a house arrest. 'You feel like a prisoner where you live', says one poorly housed person"* (1993: 164-169, translation SR). Similarly, Mike Davis' states: *"Precisely because the site is so hazardous and unattractive, it offers protection from rising land value in the city. Such sites are poverty's niche in the ecology of the city, and very poor people have little choice but to live with disaster"* (2006: 121-122). Even though no physical restrains are visible and no explicit rules written, people can still struggle to overcome space and escape their environment, as less apparent processes, from economic marginalization to emotional bonds, internalised constraints or implicit practices can prove to be more insidious.

2.1 The spatiality of climate captivity

Establishing climate captivity as an analytical lens means to engage with its spatial dimensions at multiple scales and configurations of power. The emerging field of environmental geography offers different conceptual lenses to better understand underlying process. Captivity reflects a dynamic interplay between people, places, and systems of constraint that are both material and symbolic. Individuals and groups face differentiated (in)habitability within changing risk environments and develop different ways of coping with such constraints. Places are rarely abandoned altogether, but they become increasingly uninhabitable for some, depending on intersecting social, economic, institutional, cultural and physical factors (Praskievicz, 2022, Arbit et al., 2023). Women in Bangladesh are unable to escape to higher ground during floods because norms dictate that they are not allowed to leave their houses without a male relative (Schipper 2020). In Vietnam, land scarcity can push the poor toward the most exposed areas that richer households can afford to avoid

(Bangalore et al. 2019). More generally, while high social vulnerability has been found to predict the desire to leave the most exposed areas (King et al. 2014), the people having the capability to relocate are not those in the most vulnerable situations (Eadie et al. 2020).

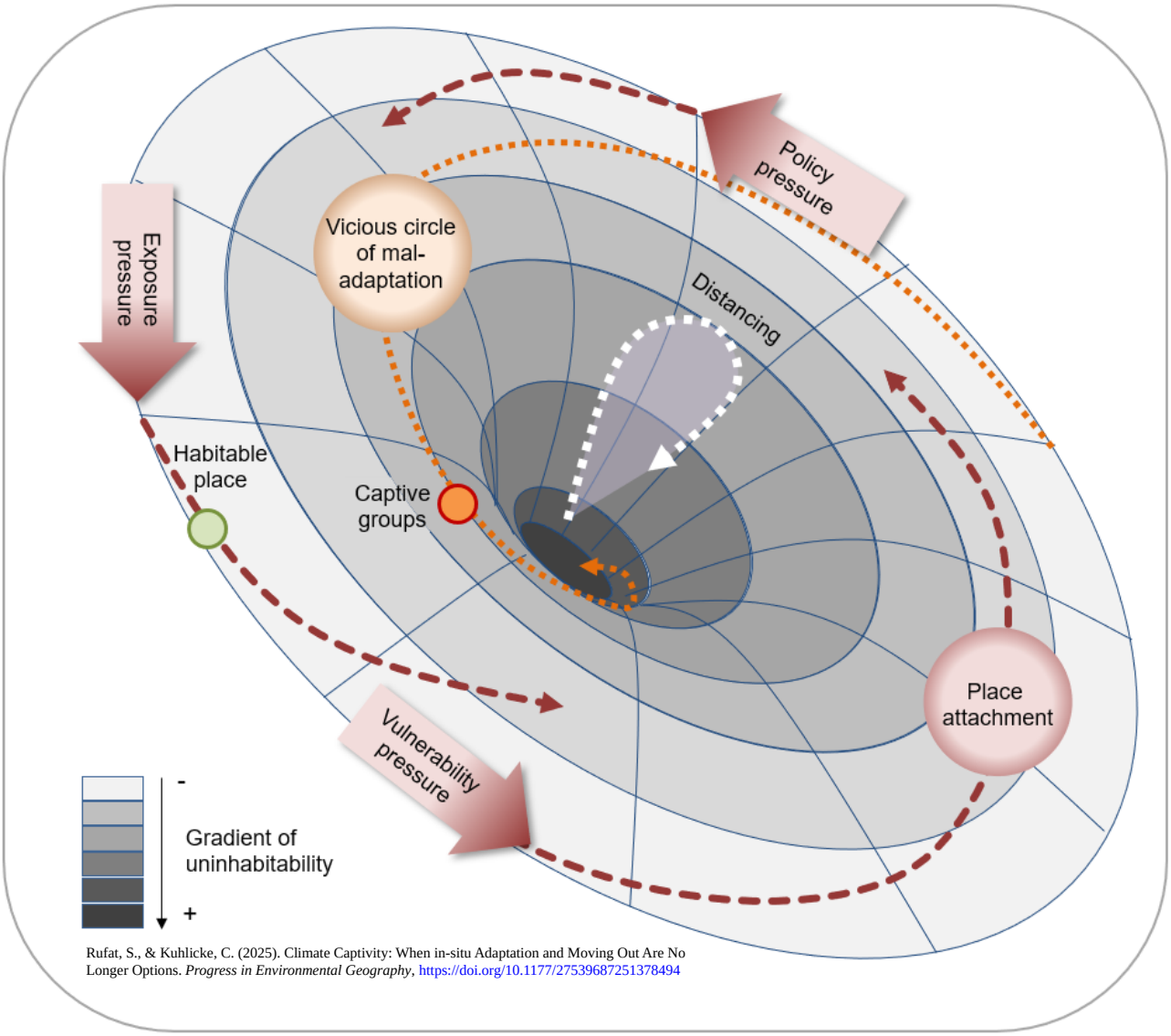
These spatial patterns are not incidental but reflect broader socio-spatial inequalities (Walker 2009) that channel certain groups into precarious geographies while others retain access to safer environments (Flaminio et al. 2022). Thus, captivity become manifest in specific places: socio-spatial sorting in response to worsening climate change impacts and the spatial proximity of vulnerable populations to hazards exposure are important underlying processes. Some people might be forced to relocate to highly exposed places (Winsemius et al. 2018), while others might be unable or unwilling to leave places becoming progressively uninhabitable, resulting in "exposure traps" (Dundon et al. 2021). At the meso scale, relocation, evacuation, and resettlement policies are often shaped by bureaucratic criteria that fail to account for lived attachments and community ties, thereby generating resistance or maladaptive outcomes (Adams 2016). At the macro scale, migration policies, border regimes, and global discourses around climate adaptation and risk management (Ayeb-Karlsson et al. 2018, Boas et al. 2019, Cannon & Müller-Mahn 2010) intersect with localized experiences of captivity. The pull and push dimensions of immobility require us to consider how spatial patterning results not just from hazard exposure but from deep-rooted systems of exclusion that restrict people's options and trajectories. At the same time, the perceived habitability of a place is not fixed or universally shared; it shifts in relation to capabilities, attachments, and mobility networks (Sterly et al. 2024). The habitability gradient is subjective and socially embedded, places may be experienced as liveable by some and unliveable by others, depending on their capacity to act, adapt, or imagine alternatives (Merschroth et al. 2004). This requires an intersectional approach that attends to how social inequalities configure the lived and perceived thresholds of viable life in a given location (Kaijser et al. 2014) and thus constitutes the riskscapes (Müller-Mahn, 2012) of people living in climate captivity.

Captivity also materializes through the organization of hydro-social territories, where infrastructures of water, land use, and governance produce differentiated access to protection and resources (Boelens et al. 2016, Hommes et al. 2019, Flaminio et al. 2022). These territories are often inscribed with historically sedimented inequalities, privileging some places and populations while exposing others to cumulative risks (Arbit et al. 2023). The uneven distribution of protective infrastructure, such as embankments, drainage, or flood shelters, results in patterned vulnerabilities, making some territories more habitable or survivable than others. Moreover, decisions about which areas are protected, neglected, or designated as "too costly" to defend carry socio-spatial implications and are rooted in underlying structural processes, such as spatial deprivation, affordability of protection through public infrastructure and the non-recognition (Bouzarovski & Simcock, 2017) of climate captivity as a key challenge of the social dimension of climate change.

Importantly, captivity draws attention to places not traditionally considered high risk. Areas that were previously regarded as safe – by governments, insurers, or residents – may become less habitable over time due to hazard reassessment, increasing exposure, or shifting perceptions of habitability. These transitional geographies, where the sense of safety is gradually eroded, are crucial sites for understanding emerging forms of climate captivity. As such, the focus should not be limited to frontline exposure zones, but should also include the slow and often invisible degradation of habitability in seemingly secure environments. Figure 1 represents the spatial and temporal dynamics of climate captivity, where slow-onset environmental change and recurring disasters interplay with vulnerability and policy pressures in a downward spiral, unbeknowingly eroding both the habitability of places and the recovery or adaptation options of the groups increasingly trapped. The subjective awareness of changing patterns of exposure and the burden of navigating unmanageable conditions are thus central to how captivity is experienced, interpreted, and coped

with (Farbotko & Campbell, 2022). The emerging awareness of exposure and perception or setting of a disproportionate or unmanageable burden is key to captivity and distancing processes.

Figure 1. The downward spiral of climate captivity



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2.2 The temporality of climate captivity

Climate captivity has a temporal dimension nesting everyday life with long-term processes and decisions. Slow-onset environmental change interplay with rapidly evolving events (Transiskus and Bazarbash, 2024), and more broadly societal long-term processes (e.g., marginalisation, abandonment) with short-term responses (e.g., evacuation, temporary housing). People do not become climate captives overnight; such complex processes unfold gradually over time, with contradictions, turns and paradoxes. Physical (e.g., increasing frequency of climate extremes or degradation of natural resources), vulnerability (e.g., socio-spatial sorting, marginalisation) and policy processes (e.g., zoning, abandonment, forced relocation) can reinforce each other. Ethnic minorities in Vietnam are “trapped” in unfavourable location, with a reinforcing loop of limited access to resources and poverty further limiting their recovery after each disaster (Phuong et al. 2023). In New Orleans, more than a decade after Katrina, low-income residents in the most flood-prone areas are still stuck with no insurance coverage, with a house they can neither afford to rebuild nor sell (Collier et al. 2021).

While people might have time to adapt when disasters occur only rarely, the increasing frequency of climate extremes is locking groups in poverty traps globally (Cappelli et al. 2021). In Senegal, as individual coping strategies are often exhausted by preceding floods, even households with high adaptive capacity are caught in a vicious circle of increased risks (Schaer 2015). Captivity is rooted in everyday processes of marginalisation, discrimination, or violence. It requires to reconstruct and contextualise the decisions, processes and structures rendering people unable or unwilling to move over several time horizons, from the short to the long-term: from failing to evacuate to safer ground before a disaster occurs (minutes to days), to trapping people for longer periods in temporary housing (weeks to years), or relocating and staying in environments that hardly support their livelihoods. This latter habitability issue is a situation that can be inherited over decades or more (Tuhkanen, 2023). Recurrent disasters are generating a vicious cycle of self-reinforcing mechanisms, exacerbating the vulnerability of exposed groups, especially in countries with higher levels of inequality, further reducing access to basic services to the poorest (Cappelli et al. 2021).

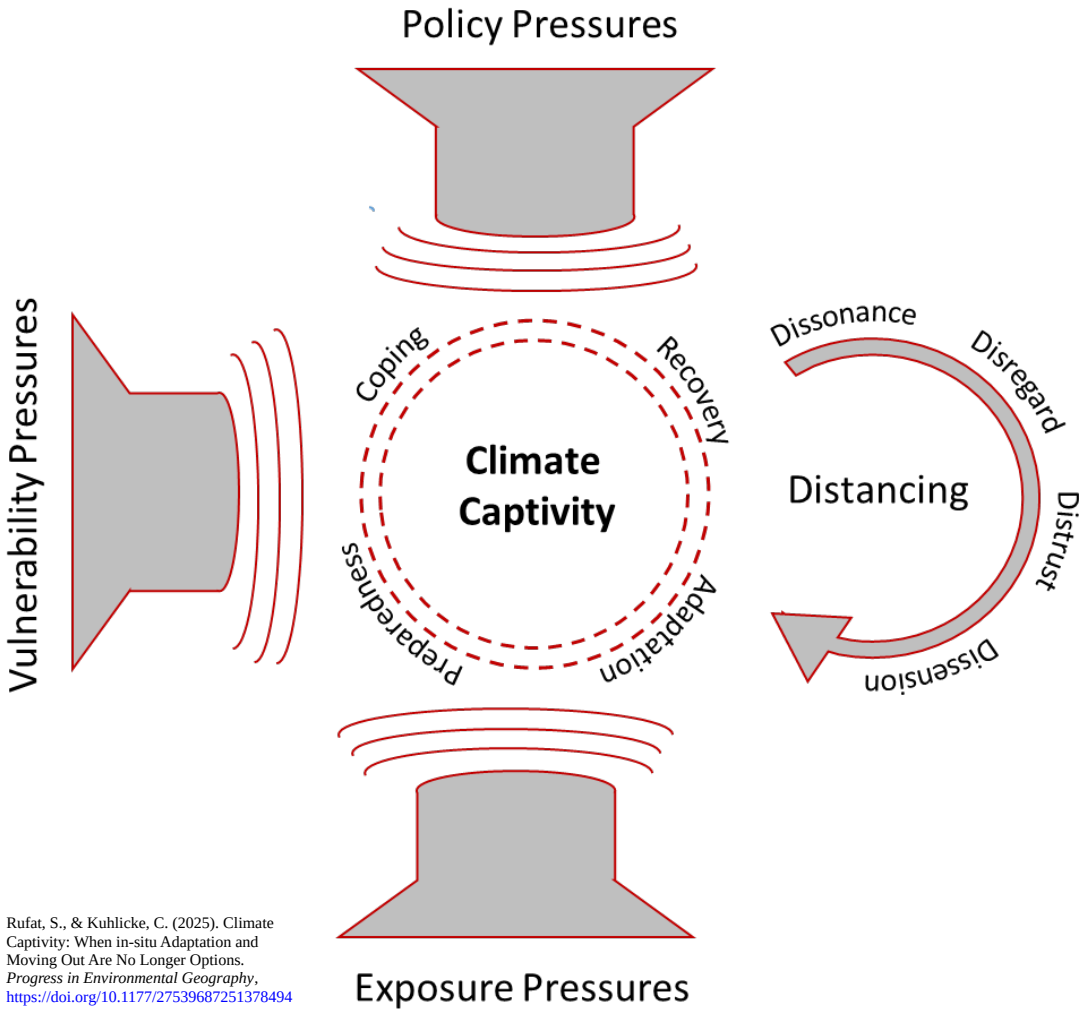
People in vulnerable situations will by definition struggle to adapt without external help (Wisner et al. 2004), as interdependent societal stratification processes result in intersecting dimensions of marginalisation (Kuran et al. 2020). While almost everywhere risk reduction strategies are biased against poor people (Hallegatte et al. 2016), less in need groups might also be dragged into a "vulnerability trap" if they capture external help (Mallick et al. 2011). Misdirection of help and risk reduction strategies failing to tackle the root causes feed the cycle of a self-reinforcing "vulnerability trap". Short-term, opportunistic or technocratic measures can end-up worsening exposure, such as touristification in Indonesia after the tsunami (Nijman 2021) or infrastructure projects driving up the proliferation of new expansions in a "disaster trap" in the Caribbean (Lazarus 2022). Along German rivers, even the most adapted households become caught in a disaster cycle as their ability to recover ends-up decreasing (Kuhlicke et al. 2020a): households flooded three times and more feel powerless even after implementing the requested adaptation measures (Köhler et al. 2023). Adapting *in-situ* requires to address the root causes of vulnerability. However, people disproportionally impacted by disasters have been found to be the least able to access external support (Gartrell et al. 2020). This means that people unable or unwilling to relocate might end-up being "left behind" (Wilson et al. 2021) and become captives.

Such vicious circles of increased risks and vulnerability might lead overwhelmed groups to behavioural maladaptation, preventing people from realizing that their limits to adaptation have been exceeded, that their action are becoming counter-productive, or that their options to stay or leave are increasingly constrained. In Mozambique, vulnerable households increase the labour supply of their children or sell assets after a disaster, at the cost of lower capacity in the future (Baez et al. 2020). In Europe, insurance regimes reinforce exposure and vulnerability through *in-situ* reconstruction, underwriting the return to the *status-quo*, inhibiting change after a disaster (O'Hare et al. 2016, Birkman et al. 2023). Maladaptation can also be infrastructural, when interventions risk having even more adverse effects on marginalised populations. In Bihar, India's poorest and most flood-prone state, temporary relocation on embankment during floods is contributing to "recursive cycles of vulnerability" (Pritchard et al. 2014). In Fiji, seawalls give people a false sense of security, and encourage them to continue activities that make them vulnerable when the infrastructure fails (Piggott-McKellar et al. 2020). Maladaptation can also be institutional, such as in Ethiopia, where the "villagisation programme" reinforced inequitable power relations, exacerbating social vulnerability, tensions and conflicts in the region (Eriksen et al. 2015). Interventions in more authoritarian contexts end up avoiding topics considered too sensitive for the government – but which are root causes of vulnerability – such as widespread discriminations, conflict, violence, or human rights (Eriksen et al. 2021).

2.3 Distancing as a coping mechanism in climate captivity

Climate captivity is constituted by a set of practices and affects that freeze and tie up. If neither moving nor *in-situ* adaptation are feasible, distancing the risk becomes the only option to preserve a liveable daily life in captivity – often unintentionally. We therefore argue that distancing is a key practice in the context of climate captivity.

Figure 2. From social vulnerability to climate captivity and maladaptative distancing



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Captivity forces to reconsider the understanding of well-established concepts such as risk awareness, risk denial, maladaptive behaviour, and place attachment. Place attachment has been put forward as one of the main reasons people might be reluctant to relocate outside of risky areas (De Dominicis et al. 2015). However, it had been previously suggested that place attachment might be an alienation, the powerless strategy to illusory reclaim control: *"low-income populations, usually lacking the means to overcome and hence command space, find themselves for the most part trapped in space (…) their restricted way to dominate space is through continuous appropriation (…) the result is an often intense attachment to place"* (Harvey 1987: 260). As a result, place attachment might be interpreted as a defensive mechanism likened to emotional distancing of threats, in a lopsided trade-off – deliberate or not – between inflated locational benefits and distanced or pushed-back location-related risks. It might also be considered as the alienation of deeming a place desirable because of the hopelessness of escaping or moving out of it. Similarly, the current focus on "information-deficit" models leads the literature to recommend more risk

communication to overcome judgment and motivation errors (Rufat et al., 2020). However, what decision-makers call “risk denial” or “lack of risk awareness” might in fact be a rationale defence mechanism, if some groups cannot escape hazard exposure, or are in too vulnerable situations to adapt to climate change impacts. Defensive answers might be their only opportunity to resolve the cognitive dissonance of a distressing exposure combined with the lack of resources to move out.

Figure 2 represents the mutually reinforcing pressures of exposure, vulnerability and policy processes through the disaster cycle (i.e., constraining preparedness, coping, recovery, and adaptation), leaving no other option than distancing as a coping mechanism. External constraints are putting too much pressure, or are generating too many contradictory injunctions, leading to cognitive dissonance and captivity. We argue that distancing, the practice of disregarding disaster exposure or climate change impacts, is a rational although maladaptive strategy, even if such an avoidance is not necessarily a deliberate or conscious coping mechanism. In fact, projecting the threats outward and subjectively distancing the risk might become the only coping mechanism left as places become increasingly uninhabitable. However, the dissonance caused by internalized constraints might dynamically lead to increasing avoiding and contrarian behaviours, as the distancing projections typically fail to break free of exposure or captivity. This escalation from dissonance to distrust or despair, with no real prospect of breaking out of the cycle or tackling the root causes of captivity, is what makes distancing a maladaptative coping mechanism.

Distancing has several dimensions, projecting the threats outward in space, in time, or cognitively. Cognitive or emotional distancing of threats is predicted by the Protection Motivation Theory (PMT) when coping actions are deemed ineffective or unfeasible (Fox-Rogers et al. 2016). Perceived vulnerability was also found to increase defensive reaction or “threat denial” (Zaalberg et al. 2009). While some studies acknowledge uncertainty about its (mal)adaptive status (McLennan et al. 2017), it has been shown to drive relocation rejection (Wiegel et al. 2021). Cognitive distancing might lead exposed households to consider that they have more pressing issues, and as a result declare that hazard exposure is not an issue for them and/or that they can postpone adaptation.

In space, distancing results in projecting the threats a bit further, to the next-door neighbourhood. This explains why, even when households acknowledge some exposure to hazards, they are inclined to consider that their neighbours are more exposed (Rufat 2015). Considering alternative locations as more – or even equally – exposed defeats the point of mobility as an adaptation strategy. The perceived distance rather than the official hazard exposure areas has been found to be predictive of adaptive behaviour (O'Neill et al. 2016). Considering that others are in a more critical situations, households might believe that their own situation is manageable or that adaptation can be postponed to after meeting more pressing needs.

Distancing hazards in time might lead exposed households to consider that while a disaster has already happened, the probabilities remain low. This has consistently been interpreted as the memory of past disasters fading away over time (Bin and Landry 2013), and especially its emotional response (Wu 2020). Projecting the threat outward in time, households might declare or believe that they have time and that adaptation is not required or can be postponed. Such detached statements and postponements are often construed as signs of a lack of awareness or social inertia.

In a state of climate captivity, the practice of disregarding risks can become a vital strategy to be able to survive and maintain mental well-being. Attempting to escape the dissonance caused by internalized constraints can lead to resistance behaviours that might often be misrepresented as social inertia or contrarian patterns (Figure 2). These may include distrust in authorities (seen as a need for better risk communication), non-compliance with recommendations (viewed as ignorance or defiance), disregard for rules and bans (perceived as risk-taking), or dissension

(interpreted as rebellion or irritability). As a result, authorities often project a narrative of a lack of willingness to leave or a social inertia in adapting, focusing on purported denial or lack of judgment instead of tackling the root causes.

2.4 Captivity as a counter-narrative

As a counter-narrative, captivity is shifting the burden from the affected people to the root causes that result in condition of captivity. Too often, the scientific engagement with people being trapped in hazard exposure, immobile or left behind, is written in a passive tense, implicitly blaming the affected people for failing to leave earlier, taking the "right" actions, or behaving as expected by the authorities responsible to disaster risk reduction and climate change adaptation. However, captive people most likely do not stop trying to adapt – or to wish to relocate to safer places – but their attempts to reduce vulnerability and/or adapt to their increasing exposure either fail or become maladaptative over time. While a failed initiative without detrimental effect is considered to be unsuccessful adaptation (Reckien et al. 2023), maladaptation refers to actions aiming at adaptation but unintentionally leading to an increase in vulnerability (Schipper 2020). Processes can become maladaptive by inadvertently (i) reinforcing vulnerability and even resulting in lock-ins that could undermine future adaptation, this is "rebounding vulnerability" (Juhola et al. 2016); (ii) "shifting vulnerability" to other groups or compromising their ability to recover (Schaer 2015); and (iii) creating negative externalities, resulting in environmental degradation, introducing of new vulnerability drivers across scales, and (re)producing vulnerability (Eriksen et al. 2021).

Shifting the focus from the apparent immobility to the less visible captivity leads to unravel underlying maladaptation process and reverses both focus and burden: With captivity we rather aim at pointing towards processes more upstream in the institutionalised context of disaster risk management. If, for instance, public safety can no longer be provided and places are left in exposure and/or are abandoned, the conditions for captivity are prepared, as O'Neil and Dua argue (2017, 5): *"If a critical mass of scholars today can say with confidence that politics has become a matter of abandonment, then we must add that it has also become, even if through a parallel and opposed genealogy, a matter of captivity"*. In this sense, it is a matter of scrutiny, if those in responsibility are not just neglecting people living in exposed places (i.e. abandonment) but whether that are also deeply invested in capturing them (captivity). Apparently, tackling the root causes of climate captivity would require collective efforts rather than individual injunctions – such as making safer areas more affordable and appealing, or assisting the most vulnerable to move out of high-risk situations.

3. Epistemological and methodological implications of climate captivity

People who are increasingly exposed to the adverse impacts of human-made climate disruption or disaster risks and at the same time have no efficient way to mitigate their consequences through *in-situ* adaptation, residential mobility or migration, are climate captives. As a result, they perceive and describe themselves either as powerless even after implementing adaptation measures, attached, bounded to a place, or captives of climate impacts and disasters. Alternatively, they might implicitly reveal the internalisation of constraints and maladaptive coping mechanisms, projecting the threats outward and distancing them in space, in time, or cognitively. Consequently, climate captivity brings with it some epistemological challenges with methodological implications: First, it requires us to embrace the ambivalence of internalised constraints and their impacts over time while at the same time encompassing the wide range of underlying individual and collective factors. Second, people often do not become climate captives overnight, such complex processes unfold gradually over time and space, with contradictions, turns and paradoxes.

3.1 A more reflexive framing of terms and concepts

Currently dominant theories in the adaptation and risk perception literature are derived from the individualistic or rational-choice paradigms (Kuhlicke et al. 2023). They usually overlook the ambivalence of captivity, particularly to the process of distancing. Concepts such as denial, lack of risk awareness, etc. are framed as deviant behaviour in the literature. They refer to a discrepancy between the declared perception and the official level of risks that respondents face (Bubeck et al. 2012). The literature considers such a discrepancy as "lack of risk awareness" (e.g., Lechowska 2018), "risk denial" (e.g., McLennan et al. 2017), or "irrational behaviour" (e.g., Wachinger et al. 2013), pinpointing it as one of the central impediments to adaptation (Norgaard 2019). However, we argue that such practices should be understood differently by unfolding climate captivity, as they might represent defence mechanism (Joffe 2003), normalization (Luís et al. 2018) or defensive avoidance (Teufel et al. 2021, Rufat and Botzen 2022, Noll et al. 2023).

Also concepts such as place attachment should be handled with a greater reflexivity. It has been found to prevent vulnerable groups from moving away from risk-prone areas by lowering the perceived risk of hazard (Swapan et al. 2021). Meta-analyses have highlighted that attached individuals are aware of their exposure to environmental hazards but do underestimate their potential effects (Bonaiuto et al. 2016), reducing motivation to adapt, such as relocating outside of risky areas (De Dominicis et al. 2015). However, we have seen that place attachment could be a defensive mechanism linked to an emotional distancing of threats, in a maladaptative trade-off, deliberate or not. Place attachment should thus also be interpreted as in "attached", "chained", "assigned", or "trapped" in a location, and also considered as the alienation of deeming a place desirable because of the hopelessness of escaping or moving out of it.

3.2 Triangulation of data and differentiated perspectives

Disentangling the ambivalence and constraints requires us to triangulate insights derived from different data sets and methodologies. The expression of place attachment, risk awareness or "choice" to stay might prove to be deceptive: people asserting their attachment (stated preference) and staying in an exposed place (revealed preference) might still prefer to live in a safer place and/or have higher risk perceptions if they had the capabilities to move to a different neighbourhood or out of vulnerability situations. Stakeholders' statements cannot be studied in isolation, because of the often contradictory weighing and decision-making processes, as well as the internalisation of constraints and maladaptive coping mechanisms (Transikus et al. 2024). Confronting the differentiated stakeholders' perspectives with the broader context requires to link large-scale surveys with reflexive in-depth interviews and external data. Large-scale standardised surveys allow for spatial approaches (Rufat et al. 2023), as former "safe" places become exposed and increasingly inhabitable, while exploring the subtle spatial variations in the critical links between hazard exposure, risk perception or awareness and social vulnerability – both stated and revealed (Rufat, 2015). In turn, qualitative interviews allow for open-ended questions about the ambivalence of decision-making and perception processes, and how people navigate between acceptance and denial, alienation and risk normalization, or between fatalism and acceptance. External data is required as a reference point, to contrast declarations with the impacts of exposure and extreme events on rent market, real estate prices, insurance premiums or the spatial distribution of amenities and public services.

As captivity is encompassing a wide range of underlying individual and collective processes, it requires to triangulate the different perspectives. More than juxtaposing the different narratives at both ends of the asymmetries of power, embracing the ambivalence of internalised constraints and their impacts over time requires to reconnect the lack of capabilities to implicit norms, including

maladaptive management or planning practices, residential segregation and the gradual erosion of livelihoods, or social marginalization and areas becoming progressively uninhabitable (Schewel. 2020). While household surveys can focus on socio-economic variables, perception and behaviour, place attachment and social ties, residential trajectories and affordability, aspirations and emotions, norms and expectations of self, community or authorities (Rufat et al. 2022, Han, 2025, Köhler et al. 2025), some collective processes do require other methodological approaches (Rufat et al., 2025). Focus groups and interviews could capture group identity, networks of support, social stratification or implicit norms and help weight the internalised constraints against the expressed or revealed aspirations (Blondin, 2021, Ayeb-Karlsson, 2020a), whereas data analysis would be required to represent changing spatial and institutional configurations, population flows and inequalities, *in-situ* versus mobility adaptation, livelihoods degradation or the slowly emerging limits to individual and collective adaptation (Nawrotzki & DeWaard, 2018, Bhatta et al. 2015).

3.3 Studying places moving from safer to increasingly uninhabitable

The selection of study areas is key to understand the long-term processes leading to climate captivity as well as its specific manifestations. Therefore, we should focus not solely on the most exposed areas, but to study also places that were until recently deemed “safe” by the authorities or by the residents, or vulnerable situations deemed manageable. Areas recently affected by extreme events, newly added to hazard exposure mapping or freshly labelled as too costly to protect fully might be a starting point. The slow or fast gradient from a “safer” place to an increasingly uninhabitable one should however be studied in all its subjectivities. The emerging awareness of exposure and perception or setting of a disproportionate or unmanageable burden is key to captivity and distancing processes.

3.4 Longitudinal or repeated cross-sectional perspectives allow to unfold captivity

Long-term research perspectives, longitudinal studies or repeated cross-sectional study designs (Bubeck et al. 2020) are necessary to understand how climate captivity unfolds. Understanding the dynamics of captivity and distancing requires to simultaneously monitor exposure and extreme events, their impacts on housing prices, residential trajectories and segregation processes, individual and collective perception and behaviour, the emerging limits to adaptation and tipping points of the gradual erosion of livelihoods, as the only affordable places become increasingly uninhabitable, and spiralling down maladaptation traps (Köhler et al. 2023). Some choices might be voluntary and explicit at first, but when people realise the exposure of their neighbourhood increases dramatically or the housing market collapses, their place attachment might become a lockdown in an increasingly uninhabitable place, or when people in vulnerable situations are made to shoulder more than they can effectively cope and their only options to escape become maladptative. This requires to combine the study of the spatial distribution of the frequency and intensity of extreme events with the institutionalized forms of local adaptation, including mapping, spatial planning, grey and green protection, and with the perception of past events and future exposition by decision-makers and residents.

4. Conclusion

In the field of climate adaptation and disaster risk reduction, climate captivity offers an alternative framing to terms such as immobility or trapped. Second, it provides a shift in the perspective to focus on the root causes of people staying in places that are potentially inhabitable rather than the symptoms. Third, it allows different communities, such as climate adaptation, migration, disaster, and urban segregation research, to engage with its spatial dimensions at multiple scales. So far, these aforementioned academic communities struggle to engage with each other, as they use

different terms, often rather metaphorically or uncritically. Contrary to the other terms that are external verdicts and often injunctions, we show that captivity first emerged as self-labelling under different seemingly inescapable constraints. We aim to establish captivity as both a counter-narrative and as an analytical lens allowing to untangle the complex web of processes that increasingly freeze and tie up in all their subjectivities as places become increasingly uninhabitable. Captivity allows to reveal the physical and non-physical constrains resulting in vicious circles and maladptation: if neither moving nor *in-situ* adaptation are feasible, subjectively distancing the risk might become the only coping mechanism left in climate captivity, rendering intentional choice less relevant. While physical constraints or legal impediments are easy to detect, internalised constraints might remain intractable, and even be denied by the stakeholders. We consider that a range of avoiding or defensive responses can be grouped together as they reflect a similar outward projection that might be a rational defence mechanism, even if it is not always a deliberate or conscious coping strategy: keeping threats at a – sometimes symbolic – distance, either in space, in time, or cognitively. We understand climate captivity as a complementary perspective to the emerging debate on habitability of places. In our view, it puts a greater focus on people, their sense-making processes, the complex and contradictory decision-making processes, and the daily struggles in places that become inhabitable, while offering a counter-narrative shifting the burden from the affected people to the root causes that result in the condition of captivity. To fully grasp conditions of climate captivity, we must move beyond individualistic explanations and adopt a reflexive and ambivalent understanding of behaviours like risk denial or place attachment, which may reflect internalised constraints rather than irrationality. Methodologically, this demands triangulation of qualitative and quantitative data to uncover hidden aspirations and coping strategies. Longitudinal and spatially sensitive research is essential to reveal how once-safe places become uninhabitable, trapping people in evolving, often maladaptive, climate realities. Ultimately, recognizing and addressing climate captivity requires us to rethink how vulnerability, adaptation, and agency are framed – shifting from blaming individual choices to uncovering the structural and systemic forces that constrain them.

Funding
The author(s) disclosed receipt of the following financial support: This work was supported by the European Research Council (ERC FiBeGa, grant number 101044374).

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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