Planning Theory & Practice |*Interface*

Climate Disruption and Planning: Resistance or Retreat?

Introduction

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Climate change is one of the most challenging scientific and political issues of our time. From a scientific perspective, the evidence regarding human induced warming of the climate system is unequivocal (IPCC, 2014). A complex, dynamic process of unprecedented environmental change has reached severe levels, inaugurating a new age of environmental breakdown (NESC, 2019). Anticipated climate change not only means changes in global average temperatures, but also changes to the frequency and intensity of extreme weather and climate events, such as severe flooding, high precipitation events and storms, droughts, wildfires, and heat/cold waves, in addition to increasing threats posed by sea level rises. While there is an overwhelming scientific consensus that human-induced climate change is happening, translating this knowledge into action remains an enduring challenge. As Buckley and Betsill (2003) observe, questions as to *what* should be done, by *whom*, and *when*, remain highly contested.

While mitigating climate change and transitioning to a zero carbon society is paramount, policy-makers are increasingly promoting *adaptation* strategies as a means of coping with anticipated climate change

risks, future uncertainties, continuing high levels of carbon emissions, and the failure of international agreements and large economies to limit emissions. Indeed, even if emissions are stopped immediately, temperatures will remain elevated for centuries due to the effect of greenhouse gases from past human emissions already present in the atmosphere (Zickfeld et al., 2013).

In this *Interface*, we explore one aspect of adaptation: addressing the question of whether to 'resist or retreat' in areas vulnerable to extreme climate change risks, including sea level rise, flooding, wildfires, heatwaves, tropical storms, and land instability or erosion. At a global level, the impact of climate disruption is potentially catastrophic, including widespread displacement of people as parts of the globe become less habitable due to excessive heat, drought or inundation from sea level rise. For example, in a recent study published in *Nature Communications*, Kulp and Strauss (2019) estimate that under a moderate scenario consistent with 2°C warming, "sea levels projected by 2050 are high enough to threaten land currently home to a total of 150 million people to a future permanently below the high tide line … [and] a total of 360 million people are [currently living] on land threatened by annual flood events in 2100" (pp. 2-3). Under a high emissions scenario, Kulp and Strauss estimate that up to 630 million people currently live on land below projected annual flood levels for 2100. Their study further highlights that 70 per cent of the total number of people worldwide currently living on vulnerable land are located in eight Asian countries: China, Bangladesh, India, Vietnam, Indonesia, Thailand, the Philippines, and Japan. This indicates a complex interaction of political and ethical issues that requires social science scrutiny to identify, understand and provide informed solutions to the existential challenges posed by climate change. Hence, this *Interface* seeks to stimulate debate in planning theory and practice on the interaction of these climate risks with urbanisation processes, thereby emphasising the role of spatial planning within wider adaptive governance dealing directly with the increasing 'hazardousness of place' (Black et al., 2011).

Environmental hazards related to current and future climate change have the potential to cause enormous damage to the built environment, housing and commercial property, and critical physical and social infrastructure, imposing significant social and financial costs (O'Neill and Scott, 2011). In a European context, the impacts of a warming climate and more extreme weather events are already being experienced. A report by the European Environment Agency (2010) highlights that extreme temperature events across Europe between 1998-2009 caused over 77,000 fatalities, while flooding and storm events were the most costly hazards accounting for €96 billion in losses (primarily damage to property and critical infrastructure). Across Europe, climate change has led to detectable changes in extreme weather (e.g. heatwaves, intense precipitation), increasing exposure of people and the built environment to climate disruption (*disaster damages*) leading to an observed increase in economic losses (*disaster losses*) (EEA, 2017). Indeed, at the time of writing (December 2019), flooding issues in the UK have made their way into national electoral debates indicating how the sometimes abstract language of climate change science is materialised for people in the tangible experience of place disruption, resulting in political mobilisation and dispute.

Reflecting such dynamics, the European Environment Agency (EEA, 2016) notes that, "climate change is not isolated; it is strongly intertwined with socio-economic factors that make it a systemic challenge" (p. 16). In relation to the hazardousness of place, this includes real estate markets, property rights, residential consumer choices and mobilities, management and regulation of land-use and urbanization. In other words, vulnerability to sea-level rise, fluvial flooding, heat stress and wildfires, increase not only through a changing climate but also continued urban development in inappropriate locations (such as on flood plains) or the design of our cities (e.g. through intensifying urban heat island effects).

An illustrative example is provided by the increasing risk of wildfires, which over the last decade have caused devastating property losses in many parts of the world including Australia, southern Europe and California (Kramer et al., 2019). While wildfires have been longstanding hazards within these regions, the last decade has witnessed a growing intensity of wildfires resulting from increasing drought conditions, warmer weather and record-breaking heatwaves. Indeed, reports suggest that ten of California's most destructive wildfires have occurred in the last decade, alongside drier, hotter weather (Schoen and McDonald, 2019).

As recorded by Sharples et al. (2016), in Australia, over the past decade or so, major bushfires at the ex-urban margins of Sydney, Canberra, and Melbourne have burnt more than a million hectares of forests and woodlands and resulted in the loss of more than 200 lives and 4000 homes. Moreover, Sharples et al. note that the loss of property and life are increasing in major urban expansion areas in Australia, prompting questions about the changing nature of fire events, characterised by increasing frequency, intensity and the development of catastrophic 'fire storms' in such densely populated areas. At the time of writing (December 2019), two Australian States have declared a state of emergency as bushfires bring a catastrophic threat to heavily populated areas along the eastern coast, with the media reporting on thousands of residents being displaced in New South Wales, with more than 120 bushfires burning across the State (BBC, 2019).

The vulnerability of communities and property to wildfires, however, is not simply due to a changing climate, but also consolidated by urbanisation patterns, particularly in amenity rich peri-urban and rural areas. For example, 25 per cent of California's population (11 million people) live in fire prone areas (Berger and Susskind, 2018), often in affluent communities in semi-rural locations characterised by amenity-led migration (Marcouiller et al. 2002). As noted by Radeloff et al. (2018), the wildland-urban

interface (where wildfires are most prevalent) in the US has witnessed rapid development, with the number of new houses rising from 30.8m to 43.4m or 41 per cent growth. Not only are these houses being accommodated in areas vulnerable to wildfires, but a growing population results in greater risk of wildfire ignitions, in turn putting more lives and houses at risk (Radeloff et al., 2018). Land-use patterns (and regulation) and human-induced climate disruption are combining to increase vulnerability to risk (Syphard et al., 2019).

In order to preserve and enhance people's quality of life in our urban, rural and coastal communities, we will have to develop a repertoire of adaptation planning methods and toolkits in order to cope with climate disruption. A business-as-usual approach will further entrench unsustainable path dependencies, such as building on flood plains or within fire prone areas, which will prove more costly to protect or adapt in the future. Planning for retreat is likely to be part of the adaptive mix of options, entailing a widening of the normative framing around adaptation beyond protection and greater transparency in assessing risks, options and implementation pathways (Lesnikowski et al., 2017). Within this context, a key theme across all the contributions to this *Interface* is the need to place equity and justice as central in planning practices dealing with affected communities – in other words, *just adaptation* to the climate emergency.

While these climate-related environmental risks represent complex challenges, Campbell (2006) reminds us that planners have a long track record of tackling 'wicked problems', which urgently need to be applied in the face of a growing climate emergency. The *Interface* begins with Daniel Tubridy, Mick Lennon and Mark Scott exploring the framing of adaptation responses and the tensions between an approach based on protecting against climate damage through 'resistance' to a planned retreat from vulnerable areas in the face of a climate emergency. While outlining the benefits of the latter, Tubridy et

al. also note the complexity of planning for retreat including from an equity perspective, a community's sense of loss, and also emerging models of dealing with relocation beyond simple compensation based approaches. Building on this latter theme, Patrick Marchman, A.R. Siders, Kelly Leilani Main, Victoria Herrmann and Debra Butler provide insights from the work of the *Climigration Network* in the US. The network comprises a group of academics, artists, community leaders and adaptation professionals who work with affected communities, dealing with relocation due to risk from climate hazards. They argue that framing 'retreat' as a single adaptation response often fails to recognise specific and variable contexts that make relocations complex and contested, instead calling for a more nuanced approach from planners and adaptation professionals in responding to climate risks. While a complex process, Marchman et al. outline an agenda for planning practice that builds on traditional planning skills, combined with a willingness to experiment and to place equity as central to any adaptation strategies.

The following contribution, by Kathryn Frank, outlines an insightful case study from Florida State, which, the author highlights, can be considered 'ground zero' for climate related hazards in the US. Despite growing risks from sea level rise, storm surges and more frequent hurricanes, Frank outlines a tendency towards a business as usual approach, particularly in relation to expensive coastal estate markets. Drawing on action-based research, Frank argues for a pragmatic planning approach, which encourages planners to avoid a simplistic short term focus on physical protection (which enables continued development), towards an approach based on 'retreat and avoidance', which accepts and manages economic decline and copes with trauma and loss.

Moving from coastal retreat, the next contribution draws on the authors' experience of working in fire prone areas in Australia. Karyn Bosomworth and Raphaele Blanchi explore housing choices and whether people take into account climate hazards in choosing where to live. This contribution examines the

intersection of land-use regulation and disaster risk reduction, and challenges planning practice to confront the question: *at what point will a location be deemed uninhabitable because of potential future risks?* This also requires planning authorities to prevent development in unsuitable locations that will further entrench future vulnerability.

The final contribution moves from examining risk and retreat in the Global North to examine the impacts of increasing vulnerability in precarious urban settlements in the Global South context. Cassidy Johnson highlights that in a Global South context, urban risks are a culmination of climate change related vulnerability plus development deficits. In particular, Johnson focuses on informal settlements, which are often located in very exposed locations (e.g. low lying land, unstable land), without any physical infrastructure to cope with risk and overlapping with poverty and an absence of political voice. People living in these areas have limited choices and often balance everyday risk with opportunities to live closer to work opportunities or close to family networks. Johnson's contribution critiques the common practice of resettlement, often involving forcible eviction from informal settlements through top-down interventions. Instead, Johnson argues that resettlement needs to framed within long-term sustainable development for affected communities, rather than as a short term means for risk reduction. As with the other contributions to this *Interface*, the final paper places equity and justice as central to any planning strategies for communities vulnerable to the climate emergency.

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Resist or Retreat? Planning for Place Disruption, Displacement and Vulnerabilities in the Face of Climate Change

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Climate Disruption and Displacement

As noted in the introduction to this *Interface*, there is almost universal agreement across academia that a degree of displacement, consequent on climate change, is inevitable. Hence, proactive planning the movement of people away from at-risk locations through 'managed retreat', 'planned relocation' or 'preventative resettlement' is becoming an important adaptation strategy (Dannenberg et al., 2019). In general terms, it is increasingly suggested that managed retreat is both inevitable and that it has substantial benefits when compared to conventional adaptation strategies, which often entail economic and environmentally costly protection interventions (UNEP, 2016). Indeed, according to Hino et al. (2017) up to 1.3 million people worldwide have been displaced through managed retreat projects over the past three decades. However, these authors note that, while significant, this figure pales in comparison to the scale of displacement predicted to arise due to climate change in the next century. Against this backdrop, managed retreat initiatives have been implemented in response to different climate change generated hazards such as sea level rise, coastal erosion and flooding. In the USA alone more than 40,000 properties have been bought out since 1989, primarily in response to coastal and

inland flooding (Mach et al., 2019). Coastal and estuarine retreat is also evident in England and Germany (Rupp-Armstrong and Nicholls, 2007), as well as is in megacities of the global south, such as Manila and Lagos (Ajibabe, 2019). An array of retreat strategies have been adopted elsewhere to manage broader environmental risks such as those associated with landslides in New Zealand (Hanna et al., 2018) and Columbia (Anguelovski et al., 2016), as well as those of drought and reduced agricultural productivity in China (Lei et al., 2017). Furthermore, managed retreat strategies are increasingly discussed as a response to wildfires in places such as California (Peterson, 2019).

It is in this context that we explore both the opportunities and the challenges of managed retreat strategies for planning practice when seeking to negotiate the decision complexities posed by climate change. This is undertaken both through a comparison with conventional adaptation strategies, and through discussing the limitations of managed retreat initiatives which have been carried out hitherto. We argue that new models of risk assessment, planning and co-production are required to address these limitations. Hence, this discussion highlights a range of important uncertainties, challenges and opportunities for future planning practice in what is becoming an increasingly important field.

Resistance or Retreat?

Many strategies currently classified as 'adaptation' would be more accurately described as 'resistance' because they involve modifying the environment and resisting climatic changes through building "better defences to protect human settlements, infrastructure and activities" (Cooper and Pile, 2014, p. 92). Such 'resistance' is most often associated with hard defences. However, as noted by Collins (2008), there are also a range of socio-institutional structures such as insurance coverage, emergency response and disaster recovery subsidies, which are further important means of providing security from natural hazards. Although differing in technological terms, a key commonality is that such measures prioritise

'protection in place' rather than changes to patterns of land use. These strategies can also be contrasted with that of managed retreat which refers to "a deliberate intervention intended to manage natural hazard risk" which involves "the abandonment of land or relocation of structures" (Hino et al., 2017, p. 364).

There are a range of well-established critiques of the idea of 'resistance' as a desirable or even effective adaptation strategy in comparison to retreat. Such critiques range from social, ecological and cultural issues to matters concerning economic and technical feasibility. In terms of the social dimensions, it is argued that protection in place is often inequitable because it tends to prioritise the security of privileged groups. For example, Collins (2008, p. 22) describes strategies for managing wildfire risk in Arizona as "enabl[ing] residential development and the security of privileged groups in amenity-rich areas subject to destructive biophysical events". Retreat could be, in comparison, a more equitable strategy if it involved ending such resource transfers and, instead, making more strategic decisions about what areas need protection. However, this depends on various assumptions regarding the characteristics of those living in at-risk areas, which will evidently vary widely both between and within different areas and in the context of different hazards.

In the case of ecological costs and benefits, it is widely recognised that efforts to resist natural hazards can have a range of counterproductive effects. Various examples of "maladaptation" are cited in the 2014 IPCC report and other sources, including the over-abstraction of groundwater in the context of droughts, 'coastal squeeze' or the loss of coastal habitats and wetlands as they are caught between rising tides and new defensive infrastructures (Few et al., 2007), or disruption to naturally occurring 'fire regimes', due to attempts to eliminate or control wildfires (Moritz et al., 2014). In contrast, retreat is often presented as an ecologically preferable alternative, precluding the need for new defensive

infrastructures, preventing future development and instead prioritising habitat restoration or the creation of new 'multifunctional' amenity spaces. However, as discussed below, there is also evidence that spaces created through retreat are being re-used in different ways with more or less beneficial ecological effects. Furthermore, there is a risk that development currently relocated from vulnerable areas may be displaced elsewhere with implications for 'receiving communities'.

It is also suggested that infrastructures of resistance embody a distinct (and reductive) cultural politics of nature. Klein et al. (2001, p. 533) argue that imposing, engineering defences such as seawalls "appeal … to the imagination of decision makers and stakeholders and – by their visibility – may be perceived to provide more safety and hold the sea at bay forever". Similarly, Walsh (2018, p. 181) suggests that one factor underlying resistance to (coastal) managed retreat in Germany is the symbolic importance of a "dyke-protected, fixed and secured coastline". In basic terms, this suggests infrastructures of resistance both reflect and reinforce an idea of continuing human dominance and control over the natural world and of clearly demarcated boundaries between nature and society. In contrast, the philosophy of retreat is often described as "working with natural processes" (Cooper and McKenna, 2008, p. 315) and evokes an ideal of social systems in dynamic interaction with the surrounding environment, although, as noted by Koslov (2016), the cultural politics of retreat is complex and can reflect contrasting ideals of human-environment interaction, including problematic aspirations to restore and preserve 'nature' at the expense of social demands.

A final important critique of the paradigm of resistance is that it is technically unfeasible to continue to provide total protection from new and intensifying climate hazards. As noted by Malm (2013, p. 826), even if seawalls were planned strictly according to need, and prioritised protecting the most vulnerable "there are limits to what any sea wall can achieve" given predicted sea level rise and other secondary

effects such as saltwater intrusion, which cannot be prevented by physical barriers. In contrast, retreat is represented as a more comprehensive and long-term risk management strategy which, according to Hino et al. (2017, p. 365) involves minimal recurring resource requirements "while permanently reducing natural hazard risk". However, this claim also requires scrutiny. It is arguably overly optimistic to suggest that any adaptation strategy can permanently reduce hazard risks in an era of widespread climate crisis. In practical terms, as noted in the 2014 IPCC report, one major challenge is to avoid relocating people to areas exposed to a new range of hazards which incoming residents will be ill-equipped to manage.

Retreat: Challenges and Uncertainties for Future Planning

The discussion above has presented a somewhat idealised view of the benefits of managed retreat. In contrast, previous research demonstrates that, hitherto, many managed retreat initiatives have been imposed in a top-down manner and, associated with this, they have had a range of problematic implications including, but not exclusively, for those relocated. Based on a review of key aspects of this literature, it is possible to further develop an understanding of challenges and uncertainties for future planning in this context.

A key issue of relevance from a future planning perspective is that retreat has had divergent implications for those being relocated, with outcomes depending on issues such who is being relocated, how initiatives are planned and designed and how potential negative impacts are addressed. In the context of coastal protection and flooding, discussions of the social implications of retreat have often centred on tangible, financial issues such as the property losses arising if defences are not maintained or expanded (e.g. Milligan et al., 2009). This has been managed differently in different places. In the UK there is generally no compensation for property losses arising from strategic choices not to defend coastlines. In

contrast in the USA, managed retreat is effectively synonymous with 'property buy outs', whereby at-risk properties are purchased and then demolished by the state (Bronen, 2015). However, this approach has been criticised by authors such as Marino (2018) for overcompensating the privileged for foreseeable losses while excluding non-property owners, such as renters.

Beyond the loss of property, previous research has demonstrated that retreat programmes have a broader range of negative consequences for those relocated. There can be negative economic implications arising from reduced access to employment or disruption to livelihoods, for example where these are dependent on coastal resources. There is evidence of social dislocation due to the disruption of established social networks (De Vries and Fraser, 2012) and that retreat can have important but often underappreciated cultural and psychological impacts, including feelings of loss, grief, distress and anxiety where there is a disruption to a sense of place and community identity (Maldonado, 2014). Furthermore, it is widely recognised that these issues are most often acutely felt in cases where they interact with pre-existing forms of deprivation or marginalisation, for example in the case of indigenous groups whose culture may already be under threat and for whom relocation could represent an existential threat to a specific place-based identity (Maldonado, 2014). It is also clear that financial compensation is an insufficient means to redress these impacts and that they are often neglected in the context of top-down processes of adaptation planning.

Such negative implications are frequently justified by the argument that retreat has wider public benefits; that it serves 'the greater good' (Flavelle, 2019). However, whether this is in fact the case depends on various factors, with one key issue being what happens to spaces created through retreat and whether they are used in the public interest. Providing evidence to the contrary, authors such as Koslov (2016) and Ajibade (2019) document instances where planning authorities are facilitating

managed retreat programmes under the guise of meeting flood protection standards to unlock the development potential of urban coastal locations for the construction of exclusive waterfront properties. In such instances retreat is unlikely to have the promised range of social benefits in terms of risk reduction, habitat creation or amenity spaces. Rather, the benefits of retreat will be captured by private interests. A further issue of concern relates to the impact of retreat programmes in the areas to which people relocate. More specifically, there is a growing awareness that managed retreat could contribute to processes of 'climate' or 'resilience gentrification' whereby vulnerable communities are displaced as wealthier residents seek security on higher ground or places otherwise less exposed to climate hazards (Gould and Lewis, 2018; Keenan et al., 2018). There is already evidence of climate gentrification in the context of (unmanaged) retreat from intense heat in Arizona (Milman, 2018), wildfires in California (Benson, 2019) and sea level rise in Miami (Keenan et al. 2018). Meanwhile the impacts of managed retreat on 'receiving communities' are just beginning to be analysed (Kaswan, 2019).

Moreover, evidence is emerging that in many cases these problematic implications arise due to top-down, expert-led models of planning and a lack of community participation in decision making regarding if and when relocation should take place. In some cases, the perceived urgency of adaptation and retreat is being used as a means to sidestep political debate and legitimise decisions which have socially inequitable outcomes (Anguelovski et al., 2019). This is most clearly apparent in the Global South where in some instances retreat has taken place by involuntary and forcible processes of displacement, often targeted at informal settlements which are "easier to evict and cheaper to expropriate" (Anguelovksi et al. 2016, p. 338). In the Global North research has also identified more subtle forms of coercion, such as the financial pressure of increasing flood insurance premiums which function to push low-income groups out of areas deemed to be 'at-risk' (Rush, 2018).

A further specific limitation of decision-making regarding managed retreat relates to the use of cost benefit analysis as a key decision-making tool. Cost benefit analysis has been linked to a disproportionate emphasis on protecting high value property from climate hazards, reinforcing a trend towards what Malm (2013, p. 809) terms "adaptation for capital rather than for people", with the consequence that retreat is more likely to be advocated in the case of low-income, minority areas (Ajibade, 2019). Cost benefit analysis has also been widely criticised as a method wholly incapable of deciphering the non-financial impacts and 'risks' of retreat, including its social, cultural and psychological implications (Maldonado, 2014) which can often be greater in the case of marginalised low-income groups. Hence, there is a need for new participatory processes of risk assessment and planning whereby a more grounded and locally-specific understanding of the implications of both climate hazards and of retreat could be produced (Bronen, 2015).

In response, research on adaptation and environmental planning has begun to explore new approaches, such as co-production, which could be applied in the context of decision-making regarding managed retreat (e.g. Rice et al., 2015). The advantage of a co-production model relates to the creation of a framework to integrate scientific expertise with community knowledge and perspectives regarding the specific social contexts and vulnerabilities with which climate hazards interact (Bronen, 2015). A second key advantage of co-production is that it involves a commitment to equalising power relations between professional or scientific and community actors such that the function of scientific experts is to enable and inform rather than direct community actions (Lane et al., 2011). The potential value of this approach is illustrated by Bronen (2015) in a study of indigenous communities threatened by coastal erosion in Alaska. Here, the author argues that a co-production approach could involve communities in generating knowledge about risks, including both the environmental changes and the "sociological effects and

vulnerabilities caused by climate change" (Bronen, 2015, p. 5). In this way it can supply a framework to address the key issue of developing a formal institutional mechanism for deciding when the risks are too great and when a state supported relocation should therefore occur. However, further research is required to explore the value of a co-production framework in the context of managed retreat in different settings and in response to different climate hazards.

Conclusions

In an era of climate disruption, managed retreat from at-risk locations is likely to become an increasingly important adaptation strategy. Against this backdrop, in some cases retreat may be a preferable strategy when compared to resistance or 'protection in place'. However, its advantages should not be taken for granted. Rather, their realisation will depend on how schemes are designed and implemented and the level of community control over decision-making. Yet, evidence suggests that there is an array of managed retreat models operating along a spectrum from state-supported but community-led processes of retreat to top-down forced displacement. Thus, the concept of managed retreat poses practical and conceptual challenges for planning as it seeks to navigate the complexities of climate change adaptation. Most basically, it is important to be cognizant of the full range of social, cultural, economic and other impacts on those relocated and find means of redress and support which extend beyond simple compensation for lost property. Further challenges include the need to ensure that managed retreat delivers wider public benefits, which requires ensuring that the spaces created through retreat are reused in the public interest, that the question of where people relocate to is given sufficient attention and that potential impacts on receiving communities are mitigated. This article has also highlighted a range of more fundamental conceptual issues for future adaptation planning. These include the need to critically consider the fitness for purpose of economic rationalities frequently deployed in current decision making regarding managed retreat that prioritise easily measurable

physical capital at the expense of less tangible but no less important social and cultural issues. Hence, there is a need for planning theory and practice to find equitable ways of adapting to climate change and enact inclusive models of planning that address a breadth of values and are sensitive to issues of justice.

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Planning Relocation in Response to Climate Change: Multi-Faceted Adaptations

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Defining Our Terms

Climate-induced migration, climigration, managed retreat, planned relocation, resettlement – numerous terms have emerged to describe the concept of people moving in response to climate change and climate-exacerbated hazards (Bronen & Chapin, 2013; Bukvic, 2015; Koslov, 2016). There are numerous terms for the phenomenon in part because it takes so many different forms.

'Retreat' is one of the three main categories of adaptation to climate change – along with protect and accommodate – but retreat itself has no standard definition (Klein et al., 2001). It encompasses the planned resettlement of populations due to widespread and potentially complete inundation of low-lying countries, such as in Bangladesh or Kiribati (McLeman, 2018); autonomous migratory patterns resulting from drought or desertification, as in North Africa (Waha et al., 2017); infrastructure relocation due to climate-exacerbated hazards and altered seasons, such as Indonesia relocating its capital (Lyons, 2019); post-disaster evacuations that become long-term resettlement, as in the United States (Sastry & Gregory, 2014); removal of flood-defense infrastructure, as in the United Kingdom (Doody, 2013); or

government-supported relocation of households or communities, as in the United States or Philippines (Greiving, Du, & Puntub, 2018). Given this diversity in the range of 'retreat' scenarios, the term cannot be approached as a singular adaptation concept. Just as 'protection' adaptations encompass seawalls, mangrove forests, living shorelines, and more – all studied and implemented as independent adaptation actions – so must retreat be seen as a suite of options rather than a single policy choice.

We, the authors, are members of the *Climigration Network* – a group of academics, artists, community leaders, and adaptation professionals who seek to ensure that when people move due to climate-induced hazards, that movement improves their lives: enabling them not just to survive but thrive. We do not speak for the entire membership, as their experiences are as varied as the types of retreat; rather, we draw on our experience with the network to illustrate why conceptualizing retreat as a single adaptation strategy ignores the specific contexts that make retreat so difficult and why, instead, planners should embrace the idea that relocation occurs in numerous and different ways and that their responses to that movement also need to be varied.

Context Matters

Leaving home is a deeply personal decision that involves many factors (Arlikatti, Maghelal, Agnimitra & Chatterjee, 2018). People develop strong connections to their physical locations, and this attachment to place can become a source of personal identity, making it difficult to give up even in the face of repeated disasters (Adger, Barnett, & Chapin, 2011). What, exactly, a person gives up when they decide to move depends on the context of the relocation, which is why understanding these myriad contexts matters so much when planning retreat. A country facing the loss of its sovereign territory, existence as an independent nation, and culture faces a different set of challenges than a renter who is forced to find new housing after a destructive storm or a farmer moving in search of a new livelihood due to drought.

Note that we say these challenges are different: not one less complicated than the other or less fraught with emotional, economic, and cultural hardship.

This is an important point because retreat policy is sometimes designed as though one policy can apply to all situations. For example, most planned retreat in the United States occurs through voluntary property acquisitions, in which homeowners sell their properties to the government and relocate, while the government demolishes the home and retains the land as open space (Mach et al., 2019). This policy, however, is not well-equipped to deal with the needs of renters, of farmers whose livelihoods and identity may be connected to their location, or of indigenous communities who may have different concepts of property ownership and community cohesion (Bronen & Chapin, 2013; Marino, 2018). A different set of laws, government agencies, and norms apply in each context, so that it is difficult to imagine a single policy being able to address all these cases. Rather, by recognizing the diversity of possible retreat scenarios, policy-makers and planners could build in flexibility or devise separate policies for distinct types of relocation.

The Role of Planners

The role of the planner, or of planning more broadly, in retreat is as complex and multi-faceted as the concept of retreat. A historical reflection on the role of the planner in society provides some interesting food for thought. Is the role of the planner to create a utopian vision of the future to address the challenges of climate change? The past reveals lessons from the preoccupations of architects such as Frank Lloyd Wright's *Usonia* or Le Corbusier's *Radiant City*, but manifestations of the ideal city are still prevalent today in language surrounding the 'smart city' or the 'resilient city'. Should planners develop retreat as a professional specialization, akin to expertise in seawall construction, for example? Should planners make policy decisions based on rational analysis of climate projections and hazard modeling?

The legacy of authoritarian and techno-rational approaches to planning predict that such approaches will be greeted with scepticism and mistrust by the communities they are supposed to help. Heavy-handed and top-down approaches to planning, and to resettlement or relocation in particular, often evoke community traumas surrounding urban renewal schemes that razed inner-city neighborhoods and created gross inequalities through red-lining and exclusionary zoning (Rothstein, 2017). 'Resettlement' can evoke even more historic examples of relocations verging on genocide for populations in North America and elsewhere (Roosevelt, 1935 and 1942).

To learn from past lessons, much of the planning profession has shifted towards a participatory process involving communicative practice (Healey, 2012) and collaborative public decision making and dialogue for wicked problems and complexity (Innes and Booher, 2010). This complexity can have many benefits, but without guidance on how to conduct fair or effective retreat, planners may be left to engage through reflex, 'muddling through' without a clear vision. This muddling can also result in less-than-desirable outcomes for the people who relocate. For example, relocations have moved people far away from their livelihoods, into homes that did not support their cultural practices, through programs that take years to complete, or divide a community in ways that cause mental stress (Binder, Barile, Baker & Kulp, 2019; Dannenberg, Frumkin, Hess & Ebi, 2019).

However, this is not inevitable: retreat need not be inequitable or ineffective. Programs for retreat can be designed to enable inclusive and participatory decision-making with positive results for those who move. We have four recommendations for planners engaging with climate adaptation and retreat:

1. Learn from history. Humans have moved in response to environmental pressures for millennia. Settlement patterns changed in response to weather and landscape. Today's concepts of 'smart growth' and shrinking Rust Belt cities sit squarely within this tradition. Planners can take the

knowledge that their profession developed to respond to population, economic, technological, political, and social change and apply these lessons to climate change. Facilitating the growth and movement of people in cities and across landscapes has never been a specialty or isolated practice – it has been and remains central to what planning is.

2. Experiment. While learning from history, planners will also need to experiment with new approaches and techniques. These experiments need to be rooted in local context and paired with rigorous evaluation (Siders, Hino & Mach, 2019). For example, a project called *Eastie for Eastie: A Toolkit for Managed Retreat* experimented with methods to communicate about retreat and found that the target audience (young or old) requires different engagement tactics. These types of experiments can help planners build a more effective toolkit.
3. Integrate and collaborate. Retreat should not be a stand-alone policy but be integrated into other planning concerns such as revenue, quality of life, gentrification, education, cultural heritage, public space and housing. This should occur through collaboration with city lawyers, emergency management officials, housing agencies, cultural heritage practitioners, public art commissioners and transportation. When people decide to relocate, they take into account numerous factors, such as school quality, commute times, local foods, and real estate prices, so any plan to address climate change via relocation will also need to consider these issues. Planners will increasingly need to be a hub that connects multiple stakeholders.
4. Keep equity at the forefront. Justice and equity are central and foundational to any conversation about retreat. People who stay and people who relocate are thinking about what is fair and whether a plan or government has behaved fairly. This includes not only current or future inequity but consideration for past wrongs. It is unlikely that any retreat policy will be able to fully undo historic injustices, but ignoring the existence of these injustices can cast a retreat effort in a bad light and

may cause the retreat program to repeat past wrongs. Planners must therefore be cognizant of the history and local context and seek to uplift local residents' knowledge, visions and expertise.

With the number of people who will move due to climate change ranging from a few million to more than a billion (IOM, 2008), retreat by any name will become one of the greatest challenges the planning profession has ever faced. However, it also offers opportunities to enhance equity, deliver justice, and create more sustainable habitats for humans and non-human species that allow our world to thrive.

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Accepting Climate Denial and Loss: Florida's Lessons for Pragmatic Adaptation

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Introduction

> "For planning theory and practice, resilience offers nothing less than a paradigm shift: a fundamental questioning of the central tenets of contemporary approaches to planning" (Shaw 2012, p. 311).

In the United States, Florida is literally ground zero for climate change. The state's two thousand kilometers of coastline, much of them highly developed, are vulnerable to rising seas and intensifying tropical storms (Wright et al., 2019). To give perspective, Florida's coasts accounts for hundreds of billions of dollars of real estate with nearly half of the nation's population residing less than four feet above high tide, an area which could be inundated within the century (Strauss et al., 2012). Yet, after eight years under a politically conservative governor who denied climate change, the state has offered relatively little support to its coastal local governments, and thus adaptation planning across them varies widely (see for example, Ruppert and Deady, 2017). Before the state was left reeling from hurricanes Irma and Michael in 2017-18, few instances of managed retreat or relocation had occurred, despite historically high flood-related property damage (Mach et al., 2019). The variety of the Florida experiences informs this commentary for a more realistic, pragmatic approach to all forms of coastal adaptation planning.[1]

Florida is indeed a study in contrasts and ironies. The Gulf of Mexico to the west is usually gentle, which has permitted the Nature Coast, an expanse of salt marshes spanning eight rural counties. But the Gulf's hurricanes are intense, as seen when Michael leveled the town of Mexico Beach in the Florida

Panhandle. Against the Atlantic Ocean is the state's largest metropolitan area known as the Gold Coast, or simply South Florida, which has six million people spread across the major cities of West Palm Beach, Fort Lauderdale, and Miami. Directly to the west is the Everglades, a vast wetland so low that the cities must account for the sea rising from both directions. The state's karst limestone substrate further complicates matters by bringing the water table to the surface during heavy rains, despite levees, and allowing saltwater to intrude into the aquifers tapped as the primary source of potable and irrigation water. Drainage canals, stormwater systems, and rivers provide additional conduits for high tides to reach inland. Yet, Miami's towering skyline, which seems to rise up from the ocean, is dotted with cranes building more high-rise condominiums (Sealey et al., 2018; Bergman, 2019).

More people are now talking about managed retreat (Siders et al., 2019), but at the same time not doing much about it. What are the implications for planning practice striving for resilience? Evident in Florida is that planners confront concomitant environmental, political, institutional, social, and economic constraints on what they can and should do about climate change (Foss, 2018). Here I draw lessons from Florida to make a case for accepting the denial and loss inherent in the clash between human development and climate change, and to establish a way forward via principles of pragmatic adaptation.

Denial: Protection and Accommodation

Understandably, those invested in the coasts are inclined to deny or minimize the threats of climate change, and planning often follows suit (Baptist, 2016). When the threats are acknowledged, urban planners present the adaptation options of protection, accommodation, managed retreat (or relocation), and proactive avoidance (Butler et al., 2016). Florida officials and planners have most often taken the short-term view of 'engineering' resilience (Davoudi, 2012) to protect existing development

through infrastructure upgrades such as sea walls, beach renourishment, and drainage pumps; or sometimes to accommodate development to the hazard, such as by raising buildings and roads (Torres et al., 2017). For example, Fort Lauderdale is considered a leader in adaptation planning because it was the first to use the state's new land use policy tool, adaptation action areas (AAA), to designate vulnerable areas for adaptation (Markell, 2016). For its AAAs, Fort Lauderdale selected flood mitigation projects, rather than retreat or avoidance. The long-term problems with protection and accommodation are that they are expensive and allow continued investment in vulnerable areas. This worsens the inevitable day of reckoning, which is likely to come on suddenly or sooner, since publicized climate and cost projections are underestimates (Ruppert and Grimm, 2013; Oppenheimer et al., 2019; DeFries et al., 2019).

Protection and accommodation can also affect a community's social fabric, as happened in Cedar Key, a small island town along the Nature Coast.[2] Longtime Cedar Key residents still mourn the replacement of the low wooden dock, which was a community gathering spot, by a concrete behemoth. They also note how the modern requirement for elevating homes one or more stories off the ground has changed neighborhood character and stranded retiree residents who can no longer climb the stairs. Likewise, Miami Beach's plans to raise flood-prone roads have residents debating a host of interrelated concerns, including impacts on traffic and drainage (Harris and Gurney, 2018).

Loss: Retreat and Avoidance

Although managed retreat and avoidance seem better aligned with long-term, 'evolutionary' resilience (Davoudi, 2012), they are not panaceas, and unmanaged retreat will be unavoidable. The planning field has developed proactive adaptation mechanisms, such as sea level rise vulnerability assessments and post disaster redevelopment plans, but, despite taking these steps, communities usually fall short on

actions and enforcement (Berke et al., 2014; Ruppert and Deady, 2017; Fu et al., 2019). Even if better supported, the pace of implementing policies and updating assessments/plans would be outmatched by accelerating climate change and capricious natural disasters.

Following hurricane Irma, Florida reconsidered retreat, and initiated a $75 million grant program for local governments to purchase damaged homes at fair-market value from willing sellers (Harris, 2019). However, buyouts are cumbersome multi-year processes which leave homeowners in limbo (Weber and Moore, 2019), and voluntary programs can hollow out neighborhoods that then isolate the remaining residents who may have rational reasons for staying (Mast, 2019).

An earlier case of a local government attempting to retreat from a vulnerable area shows the social, financial, and legal challenges. Summer Haven is a historic beachside community in St. Johns County in northeast Florida.[3] In 2004 a hurricane damaged the road between the houses and beach, Old A1A. The road had a history of washouts, so the county decided not to maintain the road and issued a temporary building moratorium, since the cost would be more than the county's budget for its entire road system, and even more money would be needed for property buyouts (Guinta, 2013). The residents sued, and after one resident had a health emergency and could not be reached by an ambulance, the county negotiated an agreement to maintain the road. Furthermore, the case established the legal precedent that government inaction when there is a 'duty to act' could support a claim for inverse condemnation (a constitutional takings clause). In 2016, soon after the county repaired the road, a hurricane wiped it out again; and before a new federal project for the road could be approved, a 2019 hurricane began carving a new inlet between the houses and buried the road in sand.

Florida has also had limited success with avoidance. A nationwide study by Climate Central (2019) found Florida to have the highest number of houses being built in vulnerable areas, despite several statewide policies aimed at coastal flood zones, including the 2015 'Peril of Flood' law requiring that mandatory local comprehensive plans explicitly address sea level rise (Ruppert and Deady, 2017). The national Biggert Waters Flood Insurance Reform Act of 2012 had the potential to curb coastal development by reducing insurance subsidies so rates would reflect the full actuarial risk, but it was repealed within two years due to public backlash. At the local level, the small municipality of Yankeetown (to the south of Cedar Key) made state news when it codified a Natural Resource AAA to protect its saltmarshes from development, but it has not implemented a consensus based recommendation to direct new growth away from low-lying developed areas and towards the higher elevation receiving area designated in the town's transferable development rights program (Volk et al., 2015).

Pragmatic Adaptation

The discussion above has situated retreat and avoidance within the broader context. The reality is that in the coming years planners will face significant inertia, spend much of their efforts shepherding protection and accommodation projects to preserve the local tax base, and perhaps their own jobs, without the benefit of much avoidance. Increasingly, as the threats amplify and funds draw down, planners will be involved with the consequences of unplanned property owner retreat, government abandonment of services, and drawn-out planned relocation programs, all of which will have profound social equity repercussions (Siders et al. 2019). Acceptance of this reality means turning towards strategies for managing urban and economic decline, coping with community trauma and loss, and humanitarianism (Hollander and Németh, 2011; Erfan, 2017; Tulumello, 2019).

One Cedar Key leader sees her town's best approach as akin to a hospice, keeping life comfortable and meaningful by maintaining their connection with nature, celebrating community, and documenting what they will likely lose, but not by going to the extremes of life support, i.e., hard engineering (Swirko, 2017). Fitting this soft, delayed retreat philosophy, the city is restoring coastal wetland and oyster reefs, and choosing to remain in place, such as when officials consciously decided to restore, not to raise or move, their City Hall following a hurricane in 2016. Accepting both climate change and societal constraints will allow community leaders and planners to reframe adaptation in terms of human meaning rather than prescriptions.

Pragmatic adaptation not only accepts denial and loss, it can open up previously unknown options for evolutionary resilience through communicative learning and planning (Innes and Booher, 2010, Campos et al., 2016, Trell and van Geet, 2019). The dynamic interconnectedness and uncertainties of coastal social-built-environmental systems under climate change, demand interdisciplinary and multi-stakeholder collaborations, and advanced engagement techniques. One such technique was a sea level rise planning role-play game developed for public workshops held during adaptation planning for the Matanzas Basin of northeast Florida.[4] The game educated participants about the nuances of adaptation strategies and enabled them to take the perspectives of different stakeholders in the region; and the participants and project leaders saw how agreements might be achieved in real life. Overall the highly collaborative Matanzas project built consensus for managed retreat and avoidance (Linhoss et al., 2014), which participants then incorporated, i.e., mainstreamed, into local government policies, private sector decisions, and land acquisition for wildlife to migrate inland. In areas with less planning capacity, collaboration can hasten progress when those assisting give local governments directly actionable products and tools, such as occurred when a university produced the policy language for Yankeetown's Natural Resource AAA (Adaptation Action Areas).

Conclusion

Florida's high-stakes struggles to come to terms with climate change have provided valuable insights into the complex reality of adaptation planning, which explained the prevalence of engineering resilience, but also redefined evolutionary resilience and the roles of protection, accommodation, retreat, and avoidance. Although key lessons were that denial and loss are inevitable, and that planners do not have as much control over outcomes as they might like, pragmatic adaptation has the positive potential to expand planning into new realms of service, human connections, and meaning.

Notes

[1] Hoch (1984) launched pragmatic planning theory. Picketts et al. (2013) began to explore climate adaptation through a pragmatic lens, but they stopped short of developing theory. The pragmatic adaptation approach developed in this commentary has principles in common with this previous work, as well as some leading literature not explicitly applying pragmatism, such as Moser and Boykoff (2013).
[2] Findings for the towns of Cedar Key and Yankeetown, in Levy County, are based on a series of action research projects begun in 2012 and led by the author and others from the University of Florida with funding from Florida Sea Grant and state agencies. Information about these projects is available at ChangingLevyCoast.org.
[3] Findings for Summer Haven and St. John County are based in part on the author's action research project, Planning for Sea Level Rise in the Matanzas Basin, conducted in 2012-15 with funding from the National Estuarine Research Reserve Science Collaborative. Information about this project is available at PlanningMatanazas.org.
[4] See above note for the Matanzas Basin project. The planning region surrounded the Guana Tolomato Matanzas National Estuarine Research Reserve (GTM NERR) and included the cities of St. Augustine and Palm Coast.

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As Safe as Houses: Do People Consider Climate Change Impacts in 'Choosing' Where to Live?

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Safe and affordable housing is a central tenet of the United Nations' Sustainable Development Goal 11 (UN, 2015). Concurrently, climate change is increasing the occurrence of natural hazards across the planet; particularly for those places already renowned for their natural hazard risks. As we write (late 2019), California is facing another round of wildfires in the Autumn, and the Australian states of New

South Wales, South Australia and Queensland are experiencing 'catastrophic'[1] fire conditions in Spring. There will undoubtedly be studies and reviews following these events (again).

As two people with a deep love of '*Country*' – the Australian landscape – we have and do consider the implications of climate change for natural hazards, particularly wildfire, in our choices about where we and our families might live. We have friends and family that have already moved from places that might be considered to have a high bushfire risk to highly urban contexts, because they were concerned that climate change is increasing the frequency and intensity of bushfires. This has led us to consider to what extent other people – where they have a choice – are making decisions about where to live, informed by an understanding of the implications of climate change for natural hazards? And, if these choices become a particularly important influence on housing and population patterns, what are the equity and justice implications?

Within the fields of disaster risk reduction and climate change adaptation (separately and together), there is a growing cohort of studies examining how authorities and communities are managing their natural hazard risks. This burgeoning academic literature is exploring a number of the implications of the intersections between housing and climate change implications for natural hazards. Reflective of the way in which housing in Australia is predominantly viewed through an economic resource lens, rather than a right, many of these studies are exploring the influence of natural hazard risks on property prices. Most studies (but not many) have examined the influence of housing prices, mostly in relation to flood events, and most are in the US. For example, in a study in New York, Boston, and Chicago before and after Hurricane Sandy, Eichholtz et al. (2018. p.1) found that "properties exposed to flood risk experience slower price appreciation after the storm than equivalent unexposed properties". Their work suggests that "the price effect is not driven by physical damage incurred, nor by concurrent unrelated

pricing trends for waterfront property; it persists through time, suggesting it does not reflect a temporary overreaction that is subsequently reversed; it is driven by higher risk premiums for exposed properties" (p. 1); and it is influenced by views of locals. Drawing on 'prospect theory', which suggests that people are likely to overestimate risks with which they have some familiarity and ignore risks that are unfamiliar, Husby (2016, p. 41) suggests that "households will ignore flood risk until a flood actually happens, after which they will attach a disproportional weight to the likelihood of a new flood". So perhaps people do not consider the possibility of risks they have not yet experienced?

A smaller but growing literature, mostly from within geography, has started examining the issue of 'climigration' - where people are moving in response to experienced or potential impacts. For example, Hamilton (2016) argues that behavioral responses to environmental pressures tend to be socially mediated and complex, with environmental 'push' forces clearest in the wake of disasters – 'climigration'. There is also the case of the United States Department of Housing and Urban Development (HUD) directly allocating $48 million of federal funding to the residents of the Isle de Jean Charles in Louisiana to relocate the entire community. In a case study of New York City following Hurricane Sandy in 2012, Buchanan *et al.* (2018) used a discrete choice experiment that suggested that the odds of homeowners who have already implemented a modest-cost measure taking out insurance or relocating in the future are 66% and 80% lower, respectively: "[t]he odds of homeowners to relocate are also ~1.9, ~2.2, and ~3.1 times as great if their peers relocate, nuisance flooding becomes a frequent occurrence, and property values fall substantially, respectively" (p. 809). In other words, if people have already undertaken some kind of action, they are less likely to relocate. Their study was also one of the few studies that considered the implications for renters. They found "that renters' motivation to relocate is largely driven more by external issues such as crime, gentrification, and economic security than by flood hazard" (p. 809). Matthews and Potts (2018) describe climigration as the adaptation

option of last resort in response to chronic and severe impacts that may render settlements unviable. They advocate for anticipatory land-use planning systems to strategically guide climigration responses if vulnerable communities are identified. What land use planning (and development) systems will we need to deal with the potential of people actively avoiding living in areas they consider too risky, or leaving where they are currently living in anticipation of more natural hazards ahead of any experience of these hazards? It seems that the foci of most studies is to explore responses *to impacts* i.e. after natural hazards have impacted communities. There appears to have been much less exploration of the extent to which people are considering the growing threats to our urban environments from climate change in their choices about where to live - where they have such choice.

There is a wealth of publicly available information and data available for any potential householder about current bushfire risks, albeit with little guidance on how to interpret this data. However, even if our awareness and concern grows, are people considering the implications of climate change in their choices around housing locations? What guidance is there if people were wanting to do so? In disaster risk reduction lexicon, the primary action to mitigate any natural hazard risk (likelihood and consequence) is to avoid creating them in the first place. Therefore, in an ideal world, we would avoid having our homes in places facing significant natural hazard risks, such as fire or flood. However, we already have significant development in some of the most well-renowned, high risk locations in the world, including in our own home State, Victoria. Concurrently, several studies have indicated that the occurrence and intensity of fire weather for these places is only going to increase and indeed, other places less well-associated with bushfire risk may increasingly face such risks (Hennessy et al., 2005). Yet, there appears to be little guidance for people in how to take this into account in their individual decisions, and also for the planning fraternity.

Studies exploring the needs, possibilities and implications of 'managed retreat' are perhaps those closest to the questions we have reflected on here. As Siders and colleagues have suggested:

> "[F]aced with global warming, rising sea levels, and the climate-related extremes they intensify, the question is no longer whether some communities will retreat—moving people and assets out of harm's way—but why, where, when, and how they will retreat. To the extent that retreat is already happening, it is typically ad hoc and focused on risk reduction in isolation from broader societal goals. It is also frequently inequitable and often ignores the communities left behind or those receiving people who retreat" (p. 761).

A similar argument perhaps to that of Matthews and Potts regarding a strategic land use planning system response, Siders *et al.* (2019) argue for a reconceptualizing of retreat "as a set of tools used to achieve societal goals, communities and nations gain additional adaptation options and a better chance of choosing the actions most likely to help their communities thrive" (p. 761). For example, the inequities of cheaper housing in higher risk areas are being explored. For example, cases such as that of Fox Beach on Staten Island, which, "after the completion of the Verrazano Bridge in 1964, the population of the island more than doubled to 500,000. The rising cost of housing throughout the rest of the city further pushed residents from the city's core into lower cost housing on the island, much of it located on floodprone areas along beaches or wetlands" (CBI, 2015, p. 1). These residents then lobbied for and received a buy-out program. However, "of the several hundred original homeowners in Fox Beach, less than a dozen remain, mostly those too behind on their mortgages to afford buyout offers without a debt forgiveness component" (ibid.). What are the implications for planning and public policy for those remaining residents with limited capacity to choose where they live, where the state has clearly agreed the location is at high risk? This literature has only begun to consider the questions this raises about increased pressure on those locations considered or perceived to face lower or fewer natural hazard risks (although not necessarily other risks), and the communities living there.

Their work highlights important ethical questions for understanding the implications of people avoiding particular locations if they perceive a growing natural hazard risk. Here, insights from pertinent fields, such as environmental justice and 'managed retreat' studies, are needed to engage with the ethical and justice implications. As disaster and climate change researchers concerned with social-ecological justice, this suggests there remain significant questions for us all, including state versus individual responsibilities, particularly in the context of property rights and the persistent short-term profit-making drivers of housing development despite long-term projections for increasing natural hazard risks. If a pattern begins to emerge where people with choice, are avoiding particular locations because of their increasing rick of natural hazards under a changing climate, what are the implications for people who do not have the privilege of such choice? Here, insights from studies of disaster and housing politics, as well as social and environmental justice, would likely be informative.

This returns us to many of the as-yet-unresolved existing challenges of intersections between disaster risk reduction and land use planning: what is the onus on land use planning authorities and policymakers to prevent development in locations facing natural hazard risks? At what point will a location be deemed uninhabitable because of potential future risks? How do planners and planning authorities ensure safe housing for all, not just for those who can afford to move to locations facing fewer or lower natural hazard risks? And when will we start to talk seriously about all this?

Notes

[1] The word catastrophic is not used here for hyperbole. It has a formal definition in bushfire warnings across Australia. Catastrophic fire conditions are 'Code Red'. - These are the worst conditions for a bush or grass fire. If a fire starts and takes hold, it will be uncontrollable, unpredictable and fast moving. Spot fires will start, move quickly and come from many directions. Homes are not designed or constructed to withstand fires in these conditions. The safest place to be is away from high risk bushfire areas

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The Implications of Climate Related Resettlement Policies in Cities of the Global South

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In cities, climate related resettlement may refer to resettlement of people living in locations considered 'at risk' due to climate-related disaster events. To understand the implications of climate-related resettlement policies in cities of the Global South, we need to ask a few simple questions: In cities of the global south, why do people live in areas that would require resettlement? What does 'climate-related resettlement' mean in policy and in practice? What does planning need to do to combat the growing trend of widespread evictions related to climate change and disaster risk?

Urban Risks are a culmination of Climate Change Risks Plus Development Deficits

Residents of cities in the global south face compounding urban risks, not only related to climate change, but also to development issues. Climate change risks are increasing, bringing variable changes to normal climatic patterns, for example sea level rise for those in coastal areas, extreme precipitation, longer rainy seasons, more tropical storms, heavier winds leading to coastal and inland flooding and landslides. Other regions, in contrast, are seeing hotter or dryer weather, more droughts and less rain, water scarcity, heat stress and air pollution (Revi et al., 2014).

These changes in weather patterns are compounded with increasing urban densities and the development challenges this brings. Worldwide it is estimated that 30 per cent of people live in informal settlements, comprising the major proportion of residents in cities of the global south. For example in Dar es Salaam, Tanzania, 60-70 per cent of urban dwellers live in informal settlements, which

lack basic infrastructure such as paved roads and pavements, piped water, sewerage and waste collection, electricity, fire safe structures, security, and access to affordable health care (United Republic of Tanzania, 2016). The increasing density of cities is leading to environmental degradation such as forests or green land cover removal for new buildings and fuel. Due to the lack of piped water infrastructure, it is common for people to drill wells and draw on ground water, which in many Asian cities, such as Jakarta, Shanghai and Bangkok, is leading to ground subsidence (Jha et al., 2012).

Why People are Living in Exposed Areas

The areas within cities that are worst exposed to urban risks are usually those inhabited by the poorest residents. This includes houses built into steep slopes at risk of landslides, informal settlements in low-lying areas or riverbeds at risk of flooding, high density informal neighbourhoods with narrow streets at risk of fire, and communities located next to dump sites at risk of disease (Hardoy, Mitlin and Satterthwaite, 2013).

Families may decide to locate to higher risk areas because these areas bring certain opportunities. The opportunity of housing that is affordable and with flexible costs, a location that is close to jobs and services that reduces the need for unaffordable transport, proximity to existing social networks, such as family or people migrating from the same regions or villages.

Living in these exposed areas carry serious risks, though, which are weighed, in people's minds, against the opportunities (Marx et al., 2016). Exposure to possible illnesses and injuries, even potential loss of life as well as monetary costs in terms of damaged property, lost wages, as well as time spent to clean up, repair, care for sick relatives, etc., when disaster happens. Within these groups, some people are particularly vulnerable, including women, the elderly, disabled people and those belonging to particular

castes. While we all live with a certain level of risk in our daily lives, a significant and growing number of people live in very high-risk areas. Exposure to climate risk is increasing people's vulnerability to everyday events as well as to large intensive disasters. While living in areas exposed to urban risks may be portrayed as a choice, as such, there is actually little choice that people have due to economic constraints. For example in Kampala, Uganda, informal settlements such as Bwaise III, are located in the lowest elevations, where all the rain water drains down from the hills. This leads to almost daily flooding during the rainy seasons, inundating people's houses and the areas around their houses. While some of the worst flooded areas in the community have been abandoned, a thriving community of people continue to live in Bwaise III and deal with the flooding problems and the health and economic difficulties these bring. For many people this is because they have lived there for many years, and have some kind of tenure status, for others the area offers cheap rental housing and access to inexpensive food and informal markets to sell goods (Lwasa et al., 2016). Sometimes families find the risks too much to bear, for example one family who had lived there for many years left the area after a family member was almost swept away in a flash flood, but they decided to come back a couple of years later due to the economic difficulties of renting elsewhere.

Why Are People Being Evicted? What is Resettlement?

According to Ferris (2012), resettlement is a major integrated, comprehensive movement of people and families, which normally involves significant distance between the original and new location. Resettlement involves not only new housing and services but also new social and economic relations, and new challenges such as access to work and social cohesion.

In an effort to try to address risks to people living in highly vulnerable areas, many governments and planners conclude that the answer lies in relocating people out of the highly exposed areas and resettling them to other locations in the city. Time after time, in urban plans or municipal operations the

solution of resettlement of people from informal areas of the city is put forth, for example, in metro Manila following the 2009 Ondoy floods (Alvarez and Cardenas, 2019), or in Jakarta where the flood risk management plan proposed the relocation of thousands of people from flood prone areas (Octavianti and Charles, 2018). In Karonga, a small town of 50,000 in Northern Malawi, relocation from high risk areas is one of the town's key planning strategies (Malawi Government, 2013)

However, resettlement as a strategy for addressing climate-related risk in urban areas is proven to be flawed. From the government's perspective, resettlement is a very costly endeavour, especially in countries that cannot afford social housing programmes. Furthermore, resettlement is rarely successful from residents' perspectives – the new locations fall short of meeting people's needs; for example, they are located far away, or require expensive payments for housing or services. Furthermore, and most importantly, resettlement programmes are, by and large, top-down in decision-making and therefore the affected communities, usually the poorest and most vulnerable in society, are forced to leave against their will. Thus, in most situations, resettlement amounts to a forced eviction. Evictions refer to the act of expulsion of someone from possession of land or house usually by a process of law. In evictions, households are moved forcibly without an alternative location being planned for the move. In other situations, while climate or other environmental risks may be used as a reasoning for the resettlement or eviction, there are many examples where relocation is officially proposed by governments on the basis of 'moving people out of harm's way', when the real intention is to clear valuable areas of the city for higher value uses, often as part of a 'global city' agenda.

Top-Down Decision-Making

One of the major problems with climate-related resettlement is insufficient understanding of decision-making processes, implementation challenges and the associated outcomes of such interventions on people and the cities in the short and long-term. Resettlement needs to be understood within the

framework of long-term sustainable development, and not just a means for risk reduction. The design and implementation of resettlement schemes and relocations often exclude key stakeholders and lose sight of the development context, creating other socio-economic and environmental risks for the people moving, and for the city.

Part of the chasm in decision-making around resettlement is that risk is subjective; people make habitation decisions based on their current availability of choices, opportunities, values and priorities. Thus, there are certain risks that are acceptable to people, based on the socio-economic and/or political opportunities offered by the location, and the value people place on these opportunities. Decision-making authorities understand risk differently, and often equate risk with exposure to extreme events and simplistically assume resettlement as a stand-alone tool for disaster risk management, a vision which is aided by legal and policy frameworks. For example, the policy concept of 'un-mitigable risk areas' in Colombia and Peru and 'untenable' in India, present visions of risk based on specific methodologies that are acted on by local level institutional actors. The data used for such decisions offers a limited view of risk and risk mitigation options available. It underestimates adaptation strategies adopted by people living in hazard-prone areas. These laws are rigid, and often place too much power in the hands of the few.

The Need for Planning and Development Solutions, Not Evictions

The risk brought on by climate change cannot be separated from everyday life; it must be seen within the broader patterns of society. If one looks solely at risk mitigation, then resettlement may seem a good option. But given the choice, people will rarely choose this option. Risk is a subjective concept and will be defined differently across sectors of society and science. Deciding on how to mitigate the risks from disaster and climate change requires a collective understanding of the values that different people

have and the current and future hazards in that place. Better information on the risks people face, and how the people affected see these risks is needed, through bottom-up ways of communicating risk. This can be coupled with scientific knowledge about the most severe threats, now and in the future.

The risks that are created by climate change need to be viewed as a development problem, and the ensuing disasters serve as an indicator of skewed development. To reduce urban risk the systemic factors and drivers of multi-dimensional poverty and inequality need urgent attention, rather than reactive approaches to remove people from high-risk areas.

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