

CLIMATE CHANGE ADAPTATION

The case for strategic and managed climate retreat

Why, where, when, and how should communities relocate?

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Faced 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. Retreat has been seen largely as a last resort, a failure to adapt, or a one-time emergency action; thus, little research has focused on retreat, leaving practitioners with little guidance. Such a narrow conception of retreat has limited decision-makers' perception of the tools available and stilted innovation. We propose a reconceptualization of retreat as a suite of adaptation options that are both strategic and managed. Strategy integrates retreat into long-term development goals and identifies why retreat should occur and, in doing so, influences where and when. Management addresses how retreat is executed. By reconceptualizing 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.

We argue for strategy that incorporates socioeconomic development and for management that is innovative, evidence-based, and context-specific. These are not radical alterations to adaptation practice—adaptation planning often starts with identifying the goals people have, and context-specific

implementation has long been a central tenet of adaptation—but they have been under-applied to retreat. Retreat is hard to do and even harder to do well, for many reasons: short-term economic gains of coastal development; subsidized insurance rates and disaster recovery costs; misaligned incentives between residents, local officials, and national governments; imperfect risk perceptions; place attachment; and preference for the status quo (1–6). A reconceptualization could make strategic, managed retreat an efficient and equitable adaptation option.

AD HOC STATUS QUO

Retreat in response to natural hazards already occurs. It can be driven by major disasters, when people abandon their homes and relocate permanently. Economic pressures such as decreasing agricultural yields or rising insurance prices sometimes push people away from hazardous areas. Government programs have relocated populations out of at-risk areas, moved roads and other infrastructure, imposed setback requirements, banned return to disaster-prone areas, or condemned and demolished buildings considered too risky (2–8). Even in areas experiencing overall growth, some people are retreating (such as in Manila, Nairobi, and New York City) (2–4, 7–10). Whether driven by disasters, market forces, or government intervention, people will continue to move from hazardous places as climate risks escalate.

Without guiding policy, such unmanaged, unstrategic, ad hoc retreat misses opportunities to contribute to societal goals. First, ad hoc retreat can be inequitable. Residents with fewer resources have fewer options to address risk. They may be unable to return and rebuild more resiliently after disaster or to afford increasing insurance rates and may feel forced into retreat. Conversely, they may be unable to afford to move and may end up financially trapped in hazardous places. Climate-related risks are expected to reduce the value of exposed properties, leading to a downward spiral of sale prices until someone is stuck, unable to sell because no buyers are willing or be-

cause the loss at which the owner could sell is financially devastating. Those living in informal settlements or contexts of insecure land tenure can be particularly affected.

Second, retreat to date has focused overwhelmingly on physical removal of people and buildings, with limited discussion of the social, cultural, psychological, or long-term economic consequences (such as gentrification, loss of heritage, or changes in housing and transport demand) (10, 11). Also, by largely overlooking remaining and receiving communities, ad hoc retreat can lead to inefficient investments, such as allowing development in or near areas soon to be abandoned (5, 6) or failing to build social and physical infrastructure needed to accommodate growing populations. In the United States, for example, retreat is often funded and implemented in isolation from decisions about coastal armoring, leading to instances in which new sea walls are being proposed to protect areas already vacated through retreat (for example, Oakwood Beach in Staten Island, New York). Land left behind by ad hoc retreat is rarely repurposed for communal benefit and may instead leave a patchwork of derelict land that can disrupt sense of community and lower neighboring property values.

STRATEGIC, MANAGED RETREAT

A preferred alternative is for retreat to be integrated into the pursuit of broader societal goals (the strategy) and its implementation tailored to context-specific goals (the management). This reorientation is needed to innovate, deploy, and refine socially viable and equitable approaches to retreat.

Strategic retreat

Retreat is not a goal in and of itself but a means of contributing to societal goals. Ideally, retreat is one of many tools to be used in pursuit of a strategy, with goals ranging from economic development to environmental conservation. Because retreat to date has been largely unstrategic across numerous scales and factors, we identify several key dimensions for designing more strategic retreat. Decision-making and planning should take place at larger geographic and temporal scales; involve multiple agencies and jurisdictions; address multiple hazards; and be integrated into planning for economic, social, and environmental goals.

Shared strategic vision for a community, organization, or region could be articulated by government, a nongovernment entity, or a partnership but involves societal rather than purely individual goals. This sets strategic retreat apart from individual households who relocate for their own benefit. Strategies articulated at larger scales may

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