New Approaches to Climate Change and Migration

Building the Adaptive Capacity of Mobile Populations

By Carol Farbotko

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Executive Summary

It is often assumed that there is a direct link between climate change and human mobility, but the effects of climate hazards on mobility are difficult to predict. While climate effects such as drought and coastal flooding can increase mobility, under certain conditions they can also suppress it. The effects of climate change also need to be understood in the context of the existing mobility of populations, many of whom have extensive geographical links and networks. Since climate change is occurring against a backdrop of globalization and urbanization, increased mobility is sometimes incorrectly labelled solely as climate migration, which in turn can lead to narrow policy responses that have unintended consequences.

The concept of "adaptative capacity" is useful for understanding the relationship between climate hazards and mobility. The resilience of communities to external shocks reflects many factors, including local governance and institutions, cultural and social characteristics, and of course the physical attributes of the region and its exposure to environmental stressors. Worsening climate conditions can result in a spectrum of mobility decisions: some individuals or communities may be trapped in place by dwindling resources, while others may choose to stay and develop coping practices; some may move as a risk-management strategy, while others may be forced to move by external factors. For instance, during bad droughts in Kenya in 1981 and 1984, herders with some resources were able to migrate to earn money to restock their cattle numbers; the very poor, meanwhile, remained in place.

Worsening climate conditions can result in a spectrum of mobility decisions: some individuals or communities may be trapped in place by dwindling resources, while others may choose to stay and develop coping practices; some may move as a risk-management strategy, while others may be forced to move by external factors.

In understanding the relationship between climate change and mobility, it is important to note that few communities are confined to one area. Many of those affected by climate change are already "translocal": they have numerous connections to distant locations. Being translocal implies both opportunities and risks when it comes to climate change adaptation. It may offer extra resources, in the form of social and physical shelter, to help people adapt to change. But such mobility can also render people vulnerable—if they are moving to cities that are themselves at risk of climate impacts, the twin dynamics of urbanization and climate change can make these populations doubly vulnerable. For instance, the shift from traditional rice farming to commercial shrimp farming in the climate-threatened deltas of Bangladesh and Vietnam is leading people to move to at-risk coastal cities, where they may be affected by cyclones or floods. Further, the costs of adaptation measures imposed on employers can sometimes be passed on to seasonal workers in the informal economy in the form of labor exploitation and low pay. Policymakers, therefore, need to understand how the unintended consequences of policies in one area (such as economic development or climate change adaptation) can increase the vulnerability of translocal populations.

The Adaptation Pathways Approach and International Collaboration on Migration

Many existing climate change adaptation measures suffer from a key limitation: they are imposed from the top down and fail to attend to the socioeconomic, cultural, and environmental context. The low-lying island state of Kiribati, for instance, faces droughts and rising sea levels, but external contractors built sea walls that do not harness local coastal knowledge, and locals lack the tools to rebuild these when they deteriorate. In another example, Indigenous people in Cambodia have been displaced from their forest homes in the name of reducing greenhouse gas emissions through the "green economy." Failure to consult local communities and tap into their resources—including existing global diaspora networks—can make adaptation measures backfire or create greater vulnerabilities elsewhere.

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An adaptation pathways approach, instead, recommends that decisions be made by governments working with communities and other stakeholders in a participatory and flexible way, and that plans be updated frequently in response to new information about social and environmental conditions or new technologies. Such an approach might make clear that the relocation of an island's population is the least desirable option and that adaptation strategies such as land reclamation are the first line of defense. But the architects of such a plan could also put in place a host of alternative options, for instance bilateral agreements that activate new mobility programs under certain environmental conditions. Adaptation pathways have been used by countries such as Fiji in its Planned Relocation Guidelines, a living document that can be updated in response to future developments, and by the low-lying atoll island state of Tuvalu.

While considerable progress on an international level has been made to advance safe human mobility in the context of climate change, the adaptation pathways approach could provide a framework for greater cooperation in developing adaptive responses—whether those come in the form of mobility or not. Countries could experiment with new labor mobility programs that are accessible to populations most affected by climate change or open up family unification programs that enable diasporas in receiving countries to support climate-affected communities abroad. But the development of such solutions should engage the affected populations themselves, who may have vital insights that can strengthen the resulting adaptative pathways. And mobility solutions, such as increasing migration channels, must be accompanied by additional measures to protect vulnerable populations, such as those moving from rural areas to coastal cities.

Policy solutions that assume that mobility is evidence of a failure to adapt miss an important point: mobility can itself be adaptive, but it can also compound existing economic and social marginalization. Local, national, and international development approaches need to better understand and address this relationship and work across portfolios to craft creative solutions accordingly.

1 Introduction

The effects of climate change are uneven, with some communities facing especially high risks of death, injury, and destruction of assets such as housing and livelihoods. These risks are not only the result of different levels of exposure to the effects of climate change—such as floods, cyclones, bushfires, extreme heat, and changing rainfall patterns—but also the socioeconomic, political, and cultural contexts in which these hazards occur. Populations already experiencing the effects of insecure livelihoods, poor governance, and socioeconomic inequalities are likely to be less resilient to environmental stressors. Furthermore, climate change is occurring against the backdrop of globalization, urbanization, and increasing human mobility, and thus needs to be understood as one factor among many in this dynamic and multi-faceted context.

How different communities adapt to hazards is difficult to measure. Adaptation is a function of individual and household characteristics, the cultural and social attributes of communities, and the broader governance and institutional context in which populations live. It plays out over long time horizons[1] and is linked to global flows of capital, ideas, and influence.[2] The adaptive capacity of populations, however, must be at the heart of designing appropriate and nuanced policy responses to climate change.[3] Since vulnerability is often closely linked to social inequity, adaptive capacity is most likely to be improved if fundamental structural barriers to socioeconomic equity are addressed.

Policymakers and development actors wishing to mitigate the adverse effects of climate change face a considerable challenge: some adaptation occurs in one place, while others occur across multiple sites that are linked by mobile human populations, such as through circular labor migration and diasporas.[4] While popular perception often frames these issues in terms of a need to either interrupt climate change's impact on human mobility or identify and protect a new category of climate migrant,[5] it is, however, now well established that environmental change does not singularly cause human mobility; that is, there is no way to definitively separate "climate change migration" from other forms of migration. Policy development is now based on an understanding of the broader economic, political, social, and demographic drivers of migration, and how these are susceptible in different and interlinking ways to environmental change.[6] Climate change impacts often negatively influence livelihoods, for example, which means decisions to migrate are often based on economic as well as climatic factors.

1 Carola Klöck and Patrick D. Nunn, "Adaptation to Climate Change in Small Island Developing States: A Systematic Literature Review of Academic Research," *The Journal of Environment & Development* 28, no. 2 (2019): 196–218.
2 Kian Goh, "Flows in Formation: The Global-Urban Networks of Climate Change Adaptation," *Urban Studies* (published online January 28, 2019).
3 Jon Barnett and Elissa Waters, "Rethinking the Vulnerability of Small Island States: Climate Change and Development in the Pacific Islands," in *The Palgrave Handbook of International Development*, eds. Jean Grugel and Daniel Hammett (London: Palgrave Macmillan, 2016), 731–48.
4 Carol Farbotko et al., "Transformative Mobilities in the Pacific: Promoting Adaptation and Development in a Changing Climate," *Asia & the Pacific Policy Studies* 5, no. 3 (2018): 393–407.
5 This paper uses the term "mobility" in preference to "migration" since it is useful to consider a broad spectrum of human movement, from local relocation of villages, to rural-urban migration, to international mobility.
6 Richard Black et al., "The Effect of Environmental Change on Human Migration," *Global Environmental Change* 21, Supplement 1 (2011): S3–S11; Koko Warner, "Coordinated Approaches to Large-Scale Movements of People: Contributions of the Paris Agreement and the Global Compacts for Migration and on Refugees," *Population and Environment* 39 (2018): 384–401.

On the other hand, there are significant vulnerabilities associated with human mobility and climate change that are not being recognized or addressed. Projects promoting climate change adaptation can themselves exacerbate vulnerability by excluding or putting extra pressure on individuals who are already marginalized, such as mobile laborers working in the informal economy. It is thus important to more accurately capture and respond to the ways in which climate change interacts with human mobility and broader socioeconomic structural conditions that contribute to vulnerability and inequity.

This report explores the relationship between climate change and mobility, and the ways mobility can be a strategic choice—or a source of even greater vulnerability. First, it outlines the concept of adaptative capacity, and discusses how mobility decisions can be adaptative or maladaptive. Next, it discusses the structural conditions that can entrench the vulnerability of mobile or "translocal" communities, after which it analyzes some of the limitations to existing adaptation approaches and outlines an alternative model focused on adaptation pathways. It concludes with some recommendations for the development of policy to reduce vulnerability and advance safe, adaptive human mobility.

2 The Relationship between Adaptation and Mobility

Adaptive capacity, or the potential to adapt to changes such as an increase in the number or intensity of natural disasters, is a useful concept for understanding how and the extent to which societies can manage climate risks. Islands, for example, are highly exposed to the effects of climate change due to their particular geographic features: location in climatologically hazardous zones and high ratios of coastline to land area.[7] Given this exposure, gradually rising sea levels and more extreme sea level events pose risks to coastal settlements, water resources, crops, and human health. These risks, in turn, can also be exacerbated by the existing characteristics of a population, such as high levels of urbanization in coastal areas and socioeconomic inequities. If disasters increase in number and intensity, recovery time is reduced and there can be compounding negative effects on infrastructure and livelihoods.[8] Adaptive capacity is a function of:[9]

- **Individual and household characteristics.** These include demographic factors such as age, gender, and education, as well as housing tenure, livelihood base, dwelling type, and so on.
- **Resources and infrastructure.** These assets include economic resources, infrastructure, technology, information, and skills.
- **Institutions.** These are the actors through which collective responses to change occur, such as improved urban planning and disaster management. Institutions are not limited to external agencies such as donors, intergovernmental organizations, or the state; they may also include social organizations such as churches and traditional leadership groups.

7 Leonard A. Nurse et al., "Small Islands," in *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects, Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. Vincente R. Barros et al. (New York: Cambridge University Press, 2014); Barnett and Waters, "Rethinking the Vulnerability of Small Island States."
8 Barnett and Waters, "Rethinking the Vulnerability of Small Island States."
9 Barnett and Waters, "Rethinking the Vulnerability of Small Island States."

- **Cultural and social characteristics.** Relevant characteristics of the population in question may include Indigenous knowledge, religious beliefs, ancestral ties to place, and mobile phone usage levels.
- **Uneven distribution of and access to resources.** Climate change often exacerbates existing vulnerabilities among populations already experiencing water, food, housing, energy, and livelihood insecurity. Distribution of and access to resources as diverse as water, land, infrastructure, institutions, capital, the rule of law, kinship networks, education, and aid are significant.

How well different societies manage risks associated with climate change thus depends on their particular culture, governance structures, and socioeconomic situation, as well as the biophysical characteristics of the places they inhabit. This complexity can make it difficult to predict who will be rendered particularly vulnerable by climate hazards. For example, during a disaster, a remote population with strong local leadership and traditional food preservation practices[10] may be more adaptive than an equally exposed peri-urban informal settlement that disaster relief teams can reach relatively quickly but that does not have well-organized community-based disaster preparedness. In cases of slow-onset impacts, such as sea level rise, if a village has access to customary land that is elevated and inland from the current village site, relocation from rising seas may be more feasible than if there is financing but no customary higher land available.[11]

Equally, a disaster can have secondary effects on vulnerable populations, caused by distant decision-making over which they have little or no control. Following a cyclone, for example, small tourism-related businesses may suffer a loss of revenue at a time when cash is urgently needed for rebuilding. Tourist-sending countries can thus inadvertently stifle disaster recovery by issuing blanket travel warnings against travel to cyclone-affected countries.[12]

Climate Change and Mobility

Are people on the move as a result of climate change? The relationship between climate change and human mobility is not straightforward. One of the most fundamental barriers to policy development is the erroneous assumption that environmental change directly causes mobility. In fact, research into the relationship between environmental change and migration (using various methods and among many different populations) has found no clear evidence of a direct causal relationship between climate change impacts and human migration. A 2019 metastudy synthesizing environmental change and human mobility research in Africa, for instance, found that it was impossible to know whether environmental change would increase or suppress mobility in the continent, due to the context-dependent way in which environmental

10 Karen E. McNamara and Shirleen S. Prasad, "Coping with Extreme Weather: Communities in Fiji and Vanuatu Share Their Experiences and Knowledge," *Climatic Change* 123, no. 2 (2014): 121–32; Anne-Maree Schwarz et al., "Vulnerability and Resilience of Remote Rural Communities to Shocks and Global Changes: Empirical Analysis from Solomon Islands," *Global Environmental Change* 21, no. 3 (2011): 1128–40.

11 Barnett and Waters, "Rethinking the Vulnerability of Small Island States."

12 Johanna Nalau, John Handmer, and Malcolm Dalesa, "The Role and Capacity of Government in a Climate Crisis: Cyclone Pam in Vanuatu," in *Climate Change Adaptation in Pacific Countries: Fostering Resilience and Improving the Quality of Life*, ed. Walter Leal Filho (Cham, Switzerland: Springer International Publishing AG, 2017).

change manifests.[13] One of the studies discussed comes from Benin, where legal uncertainty—especially regarding land tenure—was the most important driver of mobility from rural areas, a situation exacerbated but not driven by soil degradation.[14]

A challenge in understanding the link between climate change and mobility is that research often focuses only on vulnerable populations in single areas. Consequently, the social networks across distances that support and sustain people are often overlooked. Yet it is also clear that populations in climate-exposed areas often express strong connections to place, and many would thus prefer not to move or to move only a short distance. In the Polynesian[15] subregion of the Pacific Islands, for example, this preference against mobility as a climate change response holds despite a large Polynesian diaspora spanning multiple international locations.[16] Many highly exposed island communities share this reluctance to move, even where the broad risks of climate change are well understood, for example in Vanuatu,[17] Fiji, and the Maldives.[18]

It is also clear that populations in climate-exposed areas often express strong connections to place, and many would thus prefer not to move or to move only a short distance.

However, evidence suggests that past mobility is a good indicator of future mobility,[19] so it is also necessary to consider recent past movement when assessing both adaptive capacity and possible future migration. One study of environmental change and mobility in Kiribati, a low-lying island nation threatened by sea level rise, indicates that mobility had been part of livelihood strategies in the past for the majority of survey respondents (more than 80 percent), many of whom had moved (mostly internally) within the preceding five years. A similar number indicated an intention to move in the future, with at least half citing environmental conditions as one of the reasons to move.[20] Although not explicitly mentioned in the study, there is a (small) international I-Kiribati diaspora and existing labor migration opportunities for I-Kiribati in Australia and New Zealand, so the chances of positive mobility experiences for those intending to move would be quite high. The explanation may be the policy environment in Kiribati, which at the time of the

13 The synthesized empirical evidence showed differentiated influence of environmental stress on types of mobility response. Several studies confirmed, for example, that international migration, which is more costly, declined during drought but short-term internal migration increased. In rural Ethiopia, drought increased men's labor mobility but suppressed female marriage-related mobility due to the reduced affordability of marriage. See Marion Borderon et al., "Migration Influenced by Environmental Change in Africa: A Systematic Review of Empirical Evidence," *Demographic Research* 41, no. 18 (2019): 491–544.

14 Borderon et al., "Migration Influenced by Environmental Change in Africa"; Martin Doevenspeck, "The Thin Line between Choice and Flight: Environment and Migration in Rural Benin," *International Migration* 49, no. S1 (2011): e50–e68.

15 Polynesia includes island states such as Tonga, Samoa, and Tuvalu as well as Hawaii, Cook Islands, French Polynesia, and others.

16 Robert Oakes, "Culture, Climate Change and Mobility Decisions in Pacific Small Island Developing States," *Population and Environment* 40, no. 4 (2019): 480–503; Colette Mortreux and Jon Barnett, "Climate Change, Migration and Adaptation in Funafuti, Tuvalu," *Global Environmental Change* 19, no. 1 (2009): 105–12; Carol Farbotko, Elaine Stratford, and Heather Lazarus, "Climate Migrants and New Identities? The Geopolitics of Embracing or Rejecting Mobility," *Social & Cultural Geography* 17, no. 4 (2016): 533–52.

17 Nikita Perumal, "'The Place Where I Live Is Where I Belong': Community Perspectives on Climate Change and Climate-Related Migration in the Pacific Island Nation of Vanuatu," *Island Studies Journal* 13, no. 1 (2018): 45.

18 Ilan Kelman et al., "Does Climate Change Influence People's Migration Decisions in Maldives?" *Climatic Change* 153, no. 1–2 (2019): 285–99.

19 Kerstin K. Zander, Carmen Richerzhagen, and Stephen T. Garnett, "Human Mobility Intentions in Response to Heat in Urban South East Asia," *Global Environmental Change* 56 (May 2019): 18–28.

20 Lacey Allgood and Karen E. McNamara, "Climate-Induced Migration: Exploring Local Perspectives in Kiribati," *Singapore Journal of Tropical Geography* 38, no. 3 (2017): 370–85.

above-mentioned study was—uniquely in the region—promoting a "Migration with Dignity" strategy as part of its climate change adaptation policy.[21]

More broadly, human mobility is not necessarily evidence of a failure to adapt, nor does failure to adapt necessarily result in human mobility:[22] both mobility and immobility can occur in the context of environmental change.[23] Moreover, both mobility and immobility are more likely to be adaptive if experienced as an exercise of individual, household, or community agency.[24] Mobility is less likely to be adaptive if it is perceived as the only option for survival and is associated with difficulties returning. Mobility is most likely to be maladaptive if it involves coercion to move from outside actors,[25] while immobility is most likely to be maladaptive if the desire to move exists but the would-be migrants have no resources or support to do so.[26] Furthermore, conclusions about a particular case cannot be drawn until the broad conditions of the mobility are understood, taking into account context across potential sending, interim, and destination areas.

Thus, as climate change intensifies, worsening environmental conditions do not in and of themselves cause people to move, and vulnerability can manifest as either mobility or immobility. Different environmental pressures may be associated with different mobility decisions and behaviors in the same population, depending on how other factors such as age, gender, and ability, as well as broader economic, political, and social conditions, come into play. Responses include:

- **Involuntary immobility.** Some individuals, households, or settlements may be trapped in place, wanting to move but unable to do so because of a lack of resources. For example, while some herding households in Kenya used migration to earn money during a particularly bad drought in the 1980s, the very poor remained in place and were most affected by malnutrition during the drought crisis.[27]
- **Voluntary immobility.** Some individuals, households, or settlements may stay and attempt to adapt to environmental pressures where they are, and/or advocate for assistance with place-based forms of adaptation. Many groups with ancestral lands wish to stay there in strong preference to relocation in order to sustain their unique culture and way of life.[28] For example, some coastal communities in Fiji, identified for potential relocation by the national government, are expressing a strong desire not to move during government-community consultations.[29]

21 Farbotko, Stratford, and Lazarus, "Climate Migrants and New Identities?"
22 Cecilia Tacoli, "Crisis or Adaptation? Migration and Climate Change in a Context of High Mobility," *Environment and Urbanization* 21, no. 2 (2009): 513–25.
23 Caroline Zickgraf, "Immobility," in *Routledge Handbook of Environmental Displacement and Migration*, eds. Robert McLeman and François Gemenne (London: Routledge, 2018).
24 Fiona Miller, "Exploring the Consequences of Climate-Related Displacement for Just Resilience in Vietnam," *Urban Studies* 57, no. 7 (2019): 1570–87.
25 Jon Barnett and Saffron O'Neill, "Maladaptation," *Global Environmental Change* 2, no. 20 (2010): 211–13.
26 Zickgraf, "Immobility."
27 Richard Black et al., "Migration, Immobility and Displacement Outcomes Following Extreme Events," *Environmental Science & Policy* 27, no. 1 (2013): S32–S43.
28 Carol Farbotko and Celia McMichael, "Voluntary Immobility and Existential Security in a Changing Climate in the Pacific," *Asia Pacific Viewpoint* 60, no. 2 (2019): 148–62; Oakes, "Culture, Climate Change and Mobility Decisions in Pacific Small Island Developing States"; Perumal, "'The Place Where I Live Is Where I Belong.'"
29 Carol Farbotko, "Voluntary Immobility: Indigenous Voices in the Pacific," *Forced Migration Review* 57 (2018): 81–83.

- **Voluntary temporary mobility.** Some individuals or households may commence or increase circular and temporary mobility as a risk-management strategy, seeking, for instance, livelihood diversification. The Kenyan herders mentioned above became temporary labor migrants to earn money to restock their cattle numbers during the drought.[30]
- **Voluntary long-term mobility.** Some may choose long-term relocation to a new area. These new areas are often (1) close by, (2) linked to those moving through social networks, (3) within the nearest city, or (4) a combination of the three. For example, households from the villages of Nusa Hope and Nuatambu in the Solomon Islands chose to move away from the coast, which is prone to king tide and tsunami events, to lands where families had established customary ties. The moves proved to be beneficial for water security and protection from extreme weather events, but less favorable for access to services and community cohesion, since the former village inhabitants moved to several small settlements.[31]
- **Involuntary mobility.** Mobility can involve coercion, both legal and illegal. For example, in the Maldives, an unpopular government policy is seeking to consolidate remote populations spread over 200 islands onto 10–15 islands, in the name of both climate change adaptation and economic savings.[32] Illegal involuntary mobility, such as that involving forced labor through trafficking in the Indian Sundarbans, results from a host of political and economic factors that make the poor susceptible to exploitation, many of which are exacerbated by exposure to climate-related risks.[33]

That mobility is desired and voluntary does not negate the need for policy action, since neither voluntary mobility nor immobility guarantee successful adaptation or improved livelihoods. Similarly, while involuntary mobility through mandatory relocation may save lives and thus be the best option, there may be maladaptive repercussions if insufficient consideration is given to the community's knowledge about how the relocation should unfold. Populations experiencing government-led relocations associated with colonial rule, development of dams, or urban expansion have often suffered from problems such as loss of land, reduced employment, disrupted social networks, health issues, and food insecurity.[34] If government-led relocations are necessary to respond to climate change, involving the community early in local decision-making and incorporating cultural considerations into planning will offer the best chance of success.[35]

30 Black et al., "Migration, Immobility and Displacement Outcomes Following Extreme Events."
31 Simon Albert et al., "Heading for the Hills: Climate-Driven Community Relocations in the Solomon Islands and Alaska Provide Insight for a 1.5°C Future," *Regional Environmental Change* 18, no. 8 (2018): 2261–72.
32 Uma Kothari, "Political Discourses of Climate Change and Migration: Resettlement Policies in the Maldives," *The Geographical Journal* 180, no. 2 (2013): 130–40.
33 Nicole Molinari, "Intensifying Insecurities: The Impact of Climate Change on Vulnerability to Human Trafficking in the Indian Sundarbans," *Anti-Trafficking Review* 8 (2017): 50–69.
34 Brooke Wilmsen and Michael Webber, "What Can We Learn from the Practice of Development-Forced Displacement and Resettlement for Organized Resettlements in Response to Climate Change?" *Geoforum* 58 (2015): 76–85.
35 Farbotko and McMichael, "Voluntary Immobility and Existential Security in a Changing Climate in the Pacific"; Liz Koslov, "The Case for Retreat," *Public Culture* 28, no. 2 (2016): 359–87.

3 Adaptation Strategies in Mobile Populations

Few communities today are confined to only one place. Globalization is an era of intense circulation of people, capital, things, and ideas—even before climate change is taken into account.[36] Human migration associated with changing rural livelihoods and labor markets, for example, is a global phenomenon.[37] Seasonal labor migration thus needs to be understood as an established livelihood strategy in need of reform to ensure it is climate change adaptive. Individuals often move short distances to urban areas for low-skilled and informal jobs such as construction or waste-picking to both pursue alternatives to agriculture and offer support to other family members, some of whom may remain connected to the land.

Such temporary rural-to-urban migration can expand social networks that may become useful if more permanent migration is sought in the future.[38] But this migration is also placing increasing pressure on cities, particularly those with informal settlements.[39] As a result of these population dynamics, contemporary communities, once largely place based, are now often "translocal": dynamic and multisited, often remaining socially connected across distant locations, their bonds based only partly on shared roots in a particular place.[40] In this context, human mobility is becoming even more important as households respond to the intertwined effects of climate change and economic change. Social connections in different places can be an integral part of how people adapt to change,[41] as they provide social and physical support such as knowledge and emergency shelter.[42] Translocal and transnational communities can furnish social resources, such as cultural norms of reciprocity and support, but such resources are frequently overlooked when the focus of policy discussions is on climate change and vulnerability in discrete sites.

A richer understanding of adaptive capacity in mobile populations could help tailor policies and programs so that they tap into, rather than fight against, such community-based resources.[43] For example, in both Southeast Asia and the Pacific Islands, migrant knowledge networks facilitate rural agricultural innovation, which could support agricultural adaptation in multiple sites as climatic conditions change.[44]

Government and development actors also need to understand how the adaptative capacity of mobile populations is affected by socioeconomic contexts. The rights and livelihoods of mobile people are already affected by structural conditions, such as reduced state agricultural subsidies, the rising cost of

36 W. Neil Adger, Ricardo Safra de Campos, and Colette Mortreux, "Mobility, Displacement and Migration, and Their Interactions with Vulnerability and Adaptation to Environmental Risks," in *Routledge Handbook of Environmental Displacement and Migration*, eds. Robert McLeman and François Gemenne (London: Routledge, 2018).

37 Patrick Sakdapolrak et al., "Migration in a Changing Climate: Towards a Translocal Social Resilience Approach," *Die Erde: Journal of the Geographical Society of Berlin* 147, no. 2 (2016): 81–94.

38 Adger, Safra de Campos, and Mortreux, "Mobility, Displacement and Migration"; Tacoli, "Crisis or Adaptation?"

39 Kavya Michael, Tanvi Deshpande, and Gina Ziervogel, "Examining Vulnerability in a Dynamic Urban Setting: The Case of Bangalore's Interstate Migrant Waste Pickers," *Climate and Development* 11, no. 8 (2018): 667–78.

40 Adapted from Sakdapolrak et al., "Migration in a Changing Climate."

41 Tacoli, "Crisis or Adaptation?"; Barnett and Waters, "Rethinking the Vulnerability of Small Island States."

42 Sakdapolrak et al., "Migration in a Changing Climate."

43 Perumal, "'The Place Where I Live Is Where I Belong.'"

44 Olivia Dun, Natascha Klocker, and Lesley Head, "Recognising Knowledge Transfers in 'Unskilled' and 'Low-Skilled' International Migration: Insights from Pacific Island Seasonal Workers in Rural Australia," *Asia Pacific Viewpoint* 59, no. 3 (2018): 276–92; Till Rockenbauch, Patrick Sakdapolrak, Harald Sterly, "Do Translocal Networks Matter for Agricultural Innovation? A Case Study on Advice Sharing in Small-Scale Farming Communities in Northeast Thailand," *Agriculture and Human Values* 36 (2019): 685–702.

Climate change adaptation policies ... that do not take socioeconomic dynamics into account can have unintended negative consequences for vulnerable populations.

agricultural inputs (such as fertilizers), limited access to landholdings, lack of adequate labor protections, and inadequate urban planning. The negative effects of these existing structural factors could be compounded by climate change.[45] Moreover, climate change adaptation policies—such as those encouraging industries to take specific actions—that do not take socioeconomic dynamics into account can have unintended negative consequences for vulnerable populations. For instance, employers in horticultural industries in Turkey that are dependent on the seasonal mobility of informal workers have been found to pass the costs of climate adaptation programs on to their workers.[46]

Failure to consider the socioeconomic context can also be a problem in disaster situations. For example, a temporary relocation of Ni-Vanuatu people by an international organization following Cyclone Pam in 2015 left those who had moved feeling isolated and completely reliant on the organization that facilitated the move because the relocation occurred without consultation and did not utilize existing social networks and traditional systems of food exchange. A more consultative process could have prevented problems between those relocated and the host community, since the relocated people would have been able to suggest the most acceptable place to move, according to existing social and kinship relations that would best support their move.[47]

The adaptive capacity of mobile populations is thus affected by broader socioeconomic dynamics, such as institutions, policy reforms, and the flow of goods, money, and ideas. Such dynamics can be obscured by uninformed assumptions about "climate migration." For instance, state- or donor-led programs that promote commercially viable agriculture and fishing over traditional rural livelihoods can be a driver of rural-urban migration. A shift from traditional rice farming to commercial shrimp farming, for example, is occurring in the climate-risk-laden deltas of Bangladesh[48] and Vietnam.[49] Some of the most at-risk populations in those countries are people who move between delta areas and urban informal settlements of coastal megacities, which are also at risk of significant climate impacts.[50] This movement has been incorrectly attributed chiefly to climate change.[51] Such populations are likely to be particularly vulnerable if a weather-related disaster, such as a cyclone or flood, strikes but the cause of their mobility cannot be solely attributed to climate change, even while climate change must be recognized as compounding the risks that they face.

Relatedly, as cities are rapidly expanding to accommodate increasing rural-urban migration, their infrastructure, housing, planning, and utilities—already under strain—become more vulnerable to climate

45 Molinari, "Intensifying Insecurities"; Adger, Safra de Campos, and Mortreux, "Mobility, Displacement and Migration."
46 Ethemcan Turhan, Christos Zografos, and Giorgos Kallis, "Adaptation as Biopolitics: Why State Policies in Turkey Do Not Reduce the Vulnerability of Seasonal Agricultural Workers to Climate Change," *Global Environmental Change* 31 (2015): 296–306.
47 Perumal, "'The Place Where I Live Is Where I Belong.'"
48 Kasia Paprocki, "All That Is Solid Melts into the Bay: Anticipatory Ruination and Climate Change Adaptation," *Antipode* 51, no. 1 (2019): 295–315.
49 Olivia V. Dun, "Agricultural Change, Increasing Salinisation and Migration in the Mekong Delta: Insights for Potential Future Climate Change Impacts?" in *Climate Change, Migration and Human Security in Southeast Asia*, ed. Lorraine Elliott (Singapore: S. Rajaratnam School of International Studies, Nanyang Technological University, 2012).
50 Adger, Safra de Campos, and Mortreux, "Mobility, Displacement and Migration."
51 Paprocki, "All That Is Solid Melts into the Bay."

shocks.[52] For instance, climate change adaptation projects in vulnerable coastal cities can exacerbate vulnerability if they exclude the needs and voices of the urban poor. Such problems have been noted in the Great Garuda flood-resilient development in Jakarta, Indonesia; project designers did not consult local informal construction and service workers and made no plans to house or transport them in the new, largely privatized waterfront city.[53] Separating out the interests of the rich and the poor in the planning of adaptation measures is not unique to Jakarta, or even to vulnerable coastal cities.[54] Similar experiences around the world point to the urgent need to more closely consider issues of socioeconomic equity in all policies and projects that seek to respond to climate change. This is particularly critical in areas of destination for the most vulnerable.

4 The Limitations of Existing Adaptation Measures

Why have climate change adaptation measures targeting highly vulnerable populations not, on the whole, been successful to date? One challenge is that adaptation projects are typically externally imposed; focused on top-down, technology-driven measures; and do not take account of local conditions.[55]

For example, evidence suggests that introducing climate-resilient water technologies without adequate consideration of local socioeconomic, cultural, and environmental characteristics will be unsuccessful in reducing populations' vulnerability.[56] An illustrative case study comes from Kiribati, where organizations such as the World Bank and European Union have invested significantly in technological adaptation measures to enhance water security and reduce coastal erosion.[57] Kiribati faces intensifying droughts as well as rising sea levels associated with climate change, but despite extensive water and coastal adaption investment, these risks have not been substantially reduced. Drought-suitable composting latrines, for instance, have been installed in visible public places in Kiribati, which is culturally inappropriate. The latrines are therefore not used, and residents remain exposed to water- and sanitation-related diseases from open-air defecation. In another example, external contractors unfamiliar with the "atoll" (reef and lagoon island) environment have built sea walls without harnessing local coastal knowledge and under an incorrect assumption that locals will have the means and the will to rebuild them when they deteriorate.[58] In response to such failures, the Kiribati national government has taken on a more proactive role in guiding external projects, stipulating better consultation processes with communities and local government.

While improved consultation is undoubtedly important, the nature of development assistance can also stifle success: the short-term project cycles of external development organizations often favor visible outcomes

52 Adger, Safra de Campos, and Mortreux, "Mobility, Displacement and Migration."
53 Matt Wade, "Hyper-Planning Jakarta: The *Great Garuda* and Planning the Global Spectacle," *Singapore Journal of Tropical Geography* 40, no. 1 (2018): 158–72.
54 Sohel Ahmed, Kh Md Nahiduzzaman, and Md Musleh Uddin Hasan, "Dhaka, Bangladesh: Unpacking Challenges and Reflecting on Unjust Transitions," *Cities* 77 (2018): 142–57; Idowu Ajibade, "Planned Retreat in Global South Megacities: Disentangling Policy, Practice, and Environmental Justice," *Climatic Change* 157, no. 2 (2019): 299–317.
55 Klöck and Nunn, "Adaptation to Climate Change in Small Island Developing States."
56 Klöck and Nunn, "Adaptation to Climate Change in Small Island Developing States."
57 Sophie Webber, "Mobile Adaptation and Sticky Experiments: Circulating Best Practices and Lessons Learned in Climate Change Adaptation," *Geographical Research* 53, no. 1 (2015): 26–38.
58 Webber, "Mobile Adaptation and Sticky Experiments."

over long-term, embedded learning and systemic change.[59] At the same time, self-reliance and traditional knowledge among vulnerable populations is weakening, a process that can be exacerbated rather than mitigated by poorly designed external interventions.

Development projects are not alone in their failure to reduce climate vulnerability. There are also multiple initiatives in the "green economy" that aim to support vulnerable, resource-dependent communities facing climate risks and yet the success of such initiatives is rarely assured. The UN Environment Program defines the green economy as "low carbon, resource efficient, and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure, and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services."[60] Initiatives include REDD+ (a global climate change mitigation program aiming at creating financial values for carbon stored in forests) and microinsurance (small premium insurance against natural disasters in low-income populations). Such financial adaptation instruments are not solely concerned with assisting resource-dependent, vulnerable communities: other purposes include, for example, expanding markets for private insurance companies.[61] Given their multiple purposes, it is not surprising that these have not significantly advanced adaptation to climate change, and in some cases vulnerable populations have become even more so. Indigenous people have been displaced from their forest homes, for example, in the name of reducing emissions through REDD+.[62] Little is known about the ways in which disaster insurance could influence postdisaster mobility.[63] Financial adaptation instruments must be based on deep analysis of the potential secondary impacts in order to avoid exacerbating inequalities.[64]

Overall, stand-alone technological and financial adaptation measures are unlikely to be effective since they may address only one aspect of a complex suite of vulnerabilities, and thus can upset established coping mechanisms in the socioeconomic system. In response to these problems, "community-based adaptation" is often considered a suitable alternative approach. Community-based adaptation draws on a community's existing knowledge on how to respond to challenges associated with climate change and codevelops responses that factor in future climate change risks.[65]

Community-based adaptation, however, also faces significant challenges, including intracommunity disagreement, lack of skills and expertise, insufficient labor, lack of institutional support, and insufficient funding.[66] For example, positive outcomes may occur when a community organizes itself to experiment with

59 Elise Remling and Joeli Veitayaki, "Community-Based Action in Fiji's Gau Island: A Model for the Pacific?" *International Journal of Climate Change Strategies and Management* 8, no. 3 (2016): 375–98.
60 UN Development Program, "Green Economy," accessed October 27, 2020.
61 Razmig Keucheyan, "Insuring Climate Change: New Risks and the Financialization of Nature," *Development and Change* 49, no. 2 (2018): 484–501.
62 Sarah Milne and Sango Mahanty, "Value and Bureaucratic Violence in the Green Economy," *Geoforum* 98 (2019): 133–43.
63 Birgit Müller, Leigh Johnson, and David Kreuer, "Maladaptive Outcomes of Climate Insurance in Agriculture," *Global Environmental Change* 46 (2017): 23–33.
64 Carol Farbotko, "Is It Too Late to Prevent Systemic Danger to the World's Poor?" *WIREs Climate Change* 11, no. 1 (January/February 2020).
65 Saleemul Huq and Hannah Reid, *Community-Based Adaptation: A Vital Approach to the Threat Climate Change Poses to the Poor* (London: International Institute for Environment and Development, 2007).
66 Annah E. Piggott-McKellar, Karen E. McNamara, Patrick D. Nunn, and James E. M. Watson, "What Are the Barriers to Successful Community-Based Climate Change Adaptation? A Review of Grey Literature," *Local Environment* 24, no. 4 (2018): 374–90; Karen E. McNamara and Lisa Buggy, "Community-Based Climate Change Adaptation: A Review of Academic Literature," *Local Environment* 22, no. 4 (2017): 443–60.

new water technologies and thus build its own adaptive capacity. But financial or access barriers may arise when, for example, low-cost technologies are not available in local markets or an external technician needs to be hired to conduct training on a new technology.[67] Community-based adaptation to climate change that takes human mobility into account is rare, though it is beginning to be identified as a policy priority.[68]

5 Adaptation Pathways: An Alternative Approach

Strategies to improve adaptation to climate change must take account of the socioeconomic contexts in which climate-related vulnerabilities unfold, and address the structural barriers that entrench socioeconomic inequity. They must also draw on consultations with affected populations and ensure that local knowledge is incorporated into national and international governance. The research described in this report finds limitations with policy approaches that focus exclusively on one place. There needs to be better appreciation in policy circles of hidden or neglected populations that are potentially, currently, or recently mobile and that are experiencing compounding risks from climate change, policy inaction, and entrenched socioeconomic inequities.

One productive way forward, suggested in adaptation research and practice, is to follow "adaptation pathways" when planning responses to climate change issues.[69] This is a step-wise approach to decision-making that can be used in a wide variety of policy and planning arenas, from local to international governance. Decisions are made incrementally and can be adapted along the way, rather than planning projects out in their entirety before they start. Such an approach emphasizes making time and space for collective action; being flexible to take account of new information, technologies, and social and environment conditions as they come to light; accommodating diverse values and knowledges; and building consensus and learning.[70]

This is a step-wise approach to decision-making that can be used in a wide variety of policy and planning arenas, from local to international governance.

The adaption pathways approach can build consensus among a range of stakeholders, including communities, on the need for change and how to implement this change—something that can be particularly challenging in the area of international migration.[71] Adaptation pathways have proved useful in responding to large-scale climate challenges where there is a clear mandate for technical action by governments, for example flood management in European catchments. This approach has also been effective in smaller-scale contexts such as local government decision-making in coastal settlements facing sea level rise in Australia, where the potential loss of coastal assets is a highly contentious issue, and responses to climate change need to be low cost and low risk.[72]

67 Patrina Dumaru, "Community-Based Adaptation: Enhancing Community Adaptive Capacity in Druadrua Island, Fiji," *Wiley Interdisciplinary Reviews: Climate Change* 1, no. 5 (2010): 751–63.
68 Alex Arnall, Chris Hilson, and Catriona McKinnon, "Climate Displacement and Resettlement: The Importance of Claims-Making 'from Below'," *Climate Policy* 19, no. 6 (2019): 665–71.
69 Russ M. Wise et al., "Reconceptualising Adaptation to Climate Change as Part of Pathways of Change and Response," *Global Environmental Change* 28 (September 2014): 325–36.
70 Jon Barnett et al., "A Local Coastal Adaptation Pathway," *Nature Climate Change* 4, no. 12 (2014): 1103–08.
71 Barnett et al., "A Local Coastal Adaptation Pathway."
72 Barnett et al., "A Local Coastal Adaptation Pathway."

One application of this approach is in long-term decisions about settlement risk. While relocation is often the least-preferred adaptation option, guidelines and frameworks for planned relocation are also needed so that if disaster or displacement occurs, the necessary participatory, consultative structures and guidance are in place.[73] The Fiji national government used an adaptation pathways approach when developing its Planned Relocation Guidelines, guided by the principle of "an inclusive and gender responsive consultative and participatory process to strengthen communities' riposte to climate change impacts, and ensure community engagement and ownership in the relocation process."[74] The guidelines were developed collaboratively between government and civil society, and are a "living document" that can be updated in response to future change. Another example is the low-lying atoll island state of Tuvalu, which has used the adaption pathways approach to develop a Plan B should its land reclamation strategies fail (see Box 1).

While the adaptation pathways approach is fairly new it could be useful in numerous contexts. For example, the mobility of seasonal agricultural workers in Australia is already a source of knowledge transfer.[75] This process could be strengthened by agricultural adaptation pathways that encourage workers to bring skills in climate-resilient agriculture to bear in Australia or other countries, or to take such skills back to their origin countries. Alternatively, adaptation pathways could help employers to work with laborers to understand how certain issues, such as human intolerance of working in extreme heat, may affect the labor supply when climate conditions become extreme.[76] For example, increasingly severe heat waves in the Indus and Ganges river valleys in South Asia are expected to affect agricultural workers in particular.[77] In implementing these new methods, it will be important to ensure that vulnerable groups have access to sufficient, independent support when engaging with large, well-resourced organizations.

A key consideration in designing adaptation pathways is how to involve the private sector. As urban development is increasingly funded by the private sector, there is a risk that the interests of the urban poor—and the rural migrants who increasingly swell their numbers—may be neglected. Similarly, climate adaptation programs often engage private-sector partners, who may be less attuned to and motivated by the need to protect vulnerable groups than civil society, who should also be engaged. Governments, donors, and international organizations could impose more stringent requirements in development and adaptation projects so that private investors are required to transparently and rigorously address issues of socioeconomic equity. The global financial industry's Task Force on Climate-Related Financial Disclosures, a global initiative to embed climate risk information in financial markets, could offer a blueprint in this regard.[78] Related monitoring and analysis, which currently acknowledge the need to link investment decisions with information about climate risk, could be expanded to take account of social risk.[79]

73 Walter Kälin and Sanjula Weerasinghe, *Environmental Migrants and Global Governance: Facts, Policies, and Practices* (Geneva: International Organization for Migration, 2017).
74 Government of Fiji, *Planned Relocation Guidelines: A Framework to Undertake Climate Change Related Relocation* (Fiji: Ministry of Economy, 2018).
75 Dun, Klocker, and Head, "Recognising Knowledge Transfers."
76 Kerstin K. Zander et al., "Heat Stress Causes Substantial Labour Productivity Loss in Australia," *Nature Climate Change* 5, no. 7 (2015): 647–51.
77 Eun-Soon Im, Jeremy S. Pal, and Elfatih A. B. Eltahir, "Deadly Heat Waves Projected in the Densely Populated Agricultural Regions of South Asia," *Science Advances* 3, no. 8 (2017): e1603322.
78 For more information, see Task Force on Climate-Related Financial Disclosures, "About," accessed October 26, 2020.
79 Carol Farbotko, "Is It Too Late to Prevent Systemic Danger to the World's Poor?" *Wiley Interdisciplinary Reviews: Climate Change* 11, no. 1 (2020): e609.

BOX 1
The Adaptation Pathways Approach in Practice: A Case Study from Tuvalu

In low-lying atoll island states whose long-term habitability is at risk from coastal erosion, flooding, and saltwater damage, simply relocating inland is not an option. Unlike in larger island nations, there are no inland areas. Instead, atoll states are investing in land reclamation, island fortification measures, and securing maritime boundaries. But while reclaiming land is an important adaptation strategy, the long-term durability of such land is not clear and the socioeconomic impacts of development on land reclamation sites have not been extensively studied.

The Tuvalu government is dealing with this uncertainty by using an adaptation pathways approach. Thus far, it has identified relocation of its population as the least preferred option in its climate change policy, prioritizing land reclamation and other place-based adaptation measures. Simultaneously, however, Tuvalu's climate change policy identifies a need to work with the international community to increase international migration options and maintain its sovereignty elsewhere should the Tuvalu islands become uninhabitable.

Tuvalu's neighboring states, New Zealand and Australia, have indicated they may be open to discussions about future gradual increases in migration. There are already large numbers of Tuvaluans in New Zealand, many admitted through the long-standing Pacific Access Category (PAC) labor migration program, and a less sizeable diaspora in Australia, many of whom travelled there after receiving New Zealand citizenship. While the PAC migration channel has been successful in reducing the vulnerability of participants, access is limited by high costs, including airfare and English language testing. A more equitable, expanded PAC could introduce a quota for those who do not meet the current age and working capacity requirements. Australia could also introduce a new family reunion visa for Tuvaluans, and permit Tuvaluan temporary seasonal workers to transition to permanent residency. New options for funding support for families who wish to move may also be useful.

The pathways approach suggests that new migration opportunities such as these could be put in place as "dormant" options, to be triggered if a particular environmental or social threshold is crossed (e.g., X number of houses in Tuvalu destroyed by coastal flooding or erosion in one year). Such solutions involve governments mutually committing to the idea that some development assistance needs to be targeted at international migration opportunities. It should also be noted, however, that increasing migration opportunities would not alone address the significant issues associated with sustainable land reclamation or permanent loss of habitable land in low-lying atolls, including continuity of cultural heritage and political identity, and the maintenance of national sovereignty.

Sources: Richard Ewart, "Tiny Tuvalu Leads Push to Protect Pacific Maritime Boundaries," ABC, September 22, 2020; Sally Round, "Green Climate Fund Green Lights Land Reclamation in Tuvalu," RNZ, July 11, 2019; Government of Tuvalu, *Te Kaniva: Tuvalu Climate Change Policy 2012* (Tuvalu: Government of Tuvalu, 2012); Office of the Minister of Foreign Affairs, "Pacific Climate Change-Related Displacement and Migration: A New Zealand Action Plan" (Cabinet Paper, May 2, 2018); Andrea Milan, Robert Oakes, and Jillian Campbell, *Tuvalu: Climate Change and Migration. Relationships between Household Vulnerability, Human Mobility and Climate Change* (Bonn: United Nations University Institute for Environment and Human Security, 2016); Robert Oakes, "Culture, Climate Change and Mobility Decisions in Pacific Small Island Developing States," *Population and Environment* 40, no. 4 (2019): 480–503.

6 Conclusions and Recommendations

Considerable progress has been made to advance safe human mobility in the context of climate change, through frameworks such as the Peninsula Principles on Climate Displacement within States, the Nansen Initiative Protection Agenda, and the Platform on Disaster Displacement.[80] The Global Compact for Migration is a major step toward the policy principle of "allowing people to move out of harm's way."[81] However, rather than devising solutions based on the assumption that human mobility is only evidence of a failure to adapt, policymakers and development actors need to recognize that human mobility is a defining feature of many societies.[82] Mobility in a changing climate does not necessarily signify a "crisis"; it can also be a strategic response to an increasingly interconnected world of rapid change and socioeconomic inequity.

Rather than devising solutions based on the assumption that human mobility is only evidence of a failure to adapt, policymakers and development actors need to recognize that human mobility is a defining feature of many societies.

Policymakers could make greater use of the adaptation pathways approach to support adaptive responses to climate change, particularly to harmonize between those that involve mobility and those that do not. Such pathways should recognize that voluntary human mobility is a common response to change. Some options to consider include:

- **Experimenting with innovative labor mobility.** Given the close intertwining of livelihoods, social inequity, climate-related vulnerability, and human mobility, policymakers could explore new, innovative, and equitable international labor mobility opportunities. Since temporary labor migration programs can increase the vulnerability of workers from climate-vulnerable populations, efforts will need to be taken to accommodate their needs and ensure that employers do not simply pass the costs of climate risk on to workers. For instance, policymakers could consider how to promote opportunities for upskilling as well as employment, or introduce labor migration pathways that lead to permanent residency in the destination country, conditional on several years in work.
- **Improving access to labor mobility programs.** Governments that already benefit from regional mobility could consider how to modify existing programs to make them accessible to those most affected by climate change. For instance, international migration between the Pacific Islands, Australia, and New Zealand is already significant, but opportunities are based largely on historical ties between sending and receiving countries. (Niue, for example, became self-governing in free association with New Zealand in 1974, and so its citizens are New Zealand citizens with freedom to move between the two places.[83] Migration opportunities for the nearby and vulnerable low-lying states of Tuvalu

80 Displacement Solutions, *The Peninsula Principles on Climate Displacement within States* (Geneva: Displacement Solutions, 2013); Nansen Initiative, *Agenda for the Protection of Cross-Border Displaced Persons in the Context of Disasters and Climate Change, Volume I* (Geneva: The Nansen Initiative, 2015); Platform on Disaster Displacement, "What We Do," accessed October 12, 2020.

81 Walter Kälin, "The Global Compact on Migration: A Ray of Hope for Disaster-Displaced Persons," *International Journal of Refugee Law* 30, no. 4 (2018): 664–67. See also United Nations, "Global Compact for Safe, Orderly, and Regular Migration," July 13, 2018.

82 Kälin and Weerasinghe, *Environmental Migrants and Global Governance*.

83 John Connell, "Niue: Embracing a Culture of Migration," *Journal of Ethnic and Migration Studies* 34, no. 6 (2018): 1021–40.

and Kiribati, however, are limited to the Pacific Access Category labor scheme.) Gradual expansion of migration channels, triggered by agreed upon social or environmental thresholds set using an equity approach, would allow more members of at-risk populations to benefit from such programs.

- **Engaging diaspora communities.** Countries of destination could work more closely with resident diaspora communities and with countries of origin that have highly vulnerable populations. This is a potentially new area for international cooperation in addressing climate change vulnerabilities. While diasporas are often valued for their contributions to multicultural societies, and for their support of communities in their countries of origin or ancestry, far fewer discussions focus specifically on harnessing diaspora links to family members abroad in climate-vulnerable places. Diasporas can play an important role in adaptation pathways, beyond the sending of remittances. It may be efficient and effective, for example, for bilateral agreements to introduce initially small flows of voluntary international migration for populations specifically from climate-vulnerable countries through family reunification visas.

- **Leveraging public opinion in destination countries.** While building support for some forms of international mobility may be politically difficult, other areas could be more fruitfully targeted. For example, legal labor migration from climate-affected areas that addresses workforce shortages in the destination country may garner more public support than solely humanitarian-focused programs. Public debate over Australia's climate change responsibilities to the Pacific Islands, while highly fraught, became a way for civil society to publicize the often unrecognized value of Pacific Island seasonal workers in Australia's agricultural industries.[84] Actors in other destination countries may find similar opportunities to leverage the contributions of labor migrants to foster public support for new labor migration opportunities for climate-vulnerable populations.[85]

- **Driving structural change through government cooperation.** Mobility-related solutions such as increasing migration channels, while vitally important, must be accompanied by additional measures to address socioeconomic disadvantage. This is particularly important where the poor are increasingly moving from rural areas to coastal cities, and where both sending and receiving areas are highly exposed to the impacts of climate change. In such contexts, it could be useful to harness expertise from successful flood mitigation strategies in coastal cities, such as Hong Kong and Singapore, and apply these lessons to other coastal cities in Asia.[86] Such technical solutions, however, need to be combined with urban planning reforms and other cross-sectoral efforts to address socioeconomic issues in areas such as social welfare, training and education, and housing security.

- **Engaging vulnerable mobile populations in planning processes.** The future that climate change experts imagine often contrasts significantly with the future imagined by vulnerable mobile populations.[87] Such communities should be recognized as experts in their own lives and included

84 Paul Karp, "Australia's Deputy PM Apologises to Pacific for Fruit-Picking Comments 'If Any Insult Was Taken'," *The Guardian*, August 22, 2019.
85 Mariya Gromilova, "Can the EU Seasonal Workers' Directive Alleviate the Pending Crisis of Climate-Induced Displacement: Lessons from Oceania," *European Labour Law Journal* 6, no. 4 (2015): 292–320.
86 Faith K. S. Chan et al., "Towards Resilient Flood Risk Management for Asian Coastal Cities: Lessons Learned from Hong Kong and Singapore," *Journal of Cleaner Production* 187 (2018): 576–89.
87 Paprocki, "All That Is Solid Melts into the Bay."

in developing adaptive pathways.[88] Engagement should not only focus on health, shelter, and livelihoods, but also include the often intangible but nevertheless significant cultural, emotional, and political losses associated with potentially leaving one's homeland. Mobile populations need opportunities to provide input to government and international development policies and projects, not only as households or individuals with economic, health, and social needs, but also as collective entities with political and cultural rights. The greater the agency of affected populations with ties to climate-exposed places in developing solutions, the better the outcomes are likely to be.

Human mobility is a central and irreversible feature of our globalized world. As climate change continues to unfold and human mobility becomes more complex, some populations will disproportionately bear the brunt of climate-related disasters. Effective solutions to the challenges they face will not come from climate change adaptation or migration policy alone. Policymakers and development actors at all levels will need to address the socioeconomic factors that can exacerbate or mitigate such vulnerabilities.

The greater the agency of affected populations with ties to climate-exposed places in developing solutions, the better the outcomes are likely to be.

88 Fiona Miller, "Climate-Related Displacement in the Asia Pacific: Justice, Rights and Culture," *Asia Pacific Viewpoint* 60, no. 2 (2019): 111–17.

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