Loyola University Chicago International Law Review

Volume 16 | Issue 1 Article 6

2020

Water Insecurity and Climate Change as Emerging Human Migration Pressures

Michael Tiboris

Water Insecurity and Climate Change as Emerging Human Migration Pressures

Michael Tiboris

I. Introduction[1]

Water insecurity is the inability of a population to reliably gather adequate water of acceptable quality to simultaneously meet its needs for health, well-being, and basic economic development.[2] Reflecting on this definition one is struck by how much has to go right in order for a population to be water secure. Even under circumstances of relative abundance, water must be managed well—properly treated and transported—with economic uses balanced against ecological consequences and shared sources governed by law and policy. The immediacy of the emergency caused by a sudden drop in availability or quality is unusually destabilizing.[3] This underscores the extent to which water insecurity, and its consequences, are fundamentally mediated by human institutions and policies. Scarcity, even if quite deep, does not automatically result in lower quality health, well-being, or development, but it makes careful governance and thoughtful planning all the more important.[4]

Climate change raises the stakes and creates new crises. Since the publication of the International Panel on Climate Change's First Assessment Report in 1990, an enormous volume of scientific research on the effects of climate change has painted an increasingly dire picture.[5] Carbon emissions have not slowed sufficiently in the interim and halting international political efforts to reverse carbon emissions allow us to predict a near-term future that is both profoundly changed for the negative and almost unavoidable.[6] Passing the established threshold of a 1.5°C global average temperature increase above pre-industrial levels, which we are likely to do, will put hundreds of millions of people at risk of food insecurity,

[1] Thanks to Michelle David for research assistance and editing.

[2] *E.g.*, U.N. Water, *Water Security and the Global Water Agenda* (Mar. 22, 2013), https://collections.unu.edu/eserv/UNU:2651/Water-Security-and-the-Global-Water-Agenda.pdf; Brahma Chellaney, Water, Peace, and War: Confronting the Global Water Crisis 26 (2015); Colin H. Kahl, States, Scarcity, and Civil Strife in the Developing World 11 (2008); Colleen Devlin & Cullen S. Hendrix, *Trends and Triggers Redux: Climate Change, Rainfall, and Interstate Conflict*, 43 Pol. Geography 27, 28–30 (2014).

[3] Scott Moore, Subnational Hydropolitics: Conflict, Cooperation, and Institution-Building in Shared River Basins 8 (2018); Joshua Busby, Water and U.S. National Security 6 (2017), https://cfrd8-files.cfr.org/sites/default/files/pdf/2017/01/Discussion_Paper_Busby_Water_and_US_Security_OR.pdf.

[4] Moore, *supra* note 3, at 8; Busby, *supra* note 3, at 6.

[5] IPCC Working Group I, *Climate Change: The IPCC Scientific Assessment*, at 7-8 (1990), https://www.ipcc.ch/publications_and_data/publications_ipcc_first_assessment_1990_wg1.shtml.

[6] The IPCC's most current special report collects impacts of global warming of 1.5°C above pre-industrial levels related to greenhouse gas emissions. IPCC, *Global Warming of 1.5°C*, at 8, Doc. SR1.5 (Oct. 6, 2018), http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf.

water stress, and poverty.[7] Water insecurity is already quite common in the developing world. About 1.2 billion people live with physical water scarcity, where water consumption is greater than seventy-five percent of renewable supply. Even when water is available, a population may not have the technical or financial means to access it. An additional 1.6 billion people live with this sort of "economic scarcity."[8] Water insecurity clusters in low-and-middle-income countries in Sub-Saharan Africa and Central and South Asia and, within those populations, is most severe for the poor, rural populations, and women.[9] This is set to become considerably worse in the coming decades because the communities most affected by scarcity are also the least prepared to adapt to and recover from climate change.[10] This is by no means, however, a problem limited to the global poor. Cape Town, South Africa's recent water crisis demonstrates the extent to which climate change is likely to make water security a challenge even for wealthier places, historically thought to be paradigms of aggressive climate preparedness.[11] We do not have to wait for some distant future to see the effects of climate on water resources, but we should expect them to intensify significantly in the coming decades.[12] One likely consequence of this will be increased human migration away from chronic water insecurity.[13] Again, this is not just a future problem. Migration patterns toward cities in Bangladesh, for instance, display a retreat from salinized soil caused by flooding, seawater intrusion, and poor irrigation practice.[14] Other environmental migration

---

[7] *Id.* at 8-12.

[8] Peter H. Gleick et al., THE WORLD'S WATER: THE BIENNIAL REPORT ON FRESHWATER RESOURCES 2 (2014).

[9] *Id.* at 3.

[10] Z. W. Kundzewicz et al., *The Implications of Projected Climate Change for Freshwater Resources and Their Management*, 53 HYDROLOGICAL SCIENCES J. 3, 3–10 (2008) (stressing the need for research to better understand "how climate change might affect freshwater and to assist water managers who need to adapt to climate change.").

[11] Brett Walton, *Cape Town's Harrowing Journey to the Brink of Water Catastrophe*, CIRCLE OF BLUE (July 12, 2018), https://www.circleofblue.org/2018/world/cape-towns-harrowing-journey-to-the-brink-of-water-catastrophe/.

[12] Blanca E. Jiménez Cisneros & Taikan Oki, et al., *Freshwater Resources, in* CLIMATE CHANGE 2014: IMPACTS, ADAPTATION, AND VULNERABILITY 234–36 (2014), https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap3_FINAL.pdf.

[13] Richard Black et al., *The effect of environmental change on human migration*, GLOB. ENVTL. CHANGE S3, S8 (2011); M. MILETTO ET AL., MIGRATION AND ITS INTERDEPENDENCIES WITH WATER SCARCITY, GENDER AND YOUTH EMPLOYMENT (2017); Rafael Reuveny, *Climate Change-Induced Migration and Violent Conflict*, 26 POL. GEOGRAPHY 656, 658, 662 (2007); Julia Toscano, *Climate Change Displacement and Forced Migration: An International Crisis*, 6 ARIZ. J. ENVTL. L. & POL'Y 457, 462 (2015); Koko Warner et al., *Climate Change, Environmental Degradation and Migration*, 55 NAT. HAZARDS 689, 694 (2010); JEFFREY D. SACHS, THE AGE OF SUSTAINABLE DEVELOPMENT 333 (2015).

[14] Ram Mukul Fishman et al., *Over-Extraction from Shallow Bedrock Versus Deep Alluvial Aquifers: Reliability Versus Sustainability Considerations for India's Groundwater Irrigation*, 47 WATER RESOURCES RES. 1, 3 (2011), https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2011WR010617; Richard Marshall and Shibaab Rahman, INTERNAL MIGRATION IN BANGLADESH: CHARACTER, DRIVERS AND POLICY ISSUES 6, 25 (UNDP 2013), http://www.bd.undp.org/content/dam/bangladesh/docs/Publications/Pub-2013/Internal%20Migration%20in%20Bangladesh%20UNDP%20Final.pdf; *see* Michael Gillan, *Refugees or Infiltrators? The Bharatiya Janata Party and "Illegal" Migration from Bangladesh*, 26 ASIAN STUD. REV. 73, 75–76 (2002).

hotspots include Central and East Africa, Central Asia, rural China, and the Caribbean.[15]

Human migration is becoming a major logistical and political challenge which we can expect to get progressively worse with the destabilizing effects of climate change.[16] People move for many reasons, of course, some of them quite positive. Water and climate are only two of a complex set of reasons for migration and are both complex motivators in their own right. But water is potentially special in this context—the need for it is constant and urgent, its management is exceptionally complex, and it is directly affected by climate change.

This article begins with what we know about the relationship between water insecurity and the population vulnerable to human migration as a result of water in security. This is followed by a brief description of the relevant international legal instruments relevant to water-related migration. It then discusses the interaction between emerging conceptions of water rights, the authority of states to restrict migration, and the degree to which responsibility to protect water migrants can be globalized. I will argue that we cannot adequately distinguish between migration resulting from physical scarcity and failures of governance and that this ought to have consequences for our views about state obligations to accommodate migration. The article concludes with some suggestions about legal and policy instruments that would help us better respond to the expected increase in water migration.

II. Background

a. Water Insecurity as a Cause of Human Migration

The causes of human migration in any particular case are irreducibly complex and context-dependent.[17] As a result, a cottage research industry has popped up to argue that, because individual factors like "water scarcity" are rarely unambiguously identified as causal factors, climate migration does not describe a real or emerging challenge.[18] It does not follow from complexity, however, that climate change or its water security consequences are not causally significant ele-

---

15 Alex de Sherbinin, *Climate Change Hotspots Mapping: What Have We Learned?*, 123 CLIMATIC CHANGE 23, 28 (2014); *see* Warner et al., *supra* note 13, at 692, 702.

16 *See generally* Mostafa Mahmud Naser, *Climate Change, Environmental Degradation, and Migration: A Complex Nexus*, 36 WM. & MARY ENV'T. L. & POL'Y REV. 713, 721, 732–33 (2011) (In this article, I will use the terms "migration" and "displacement," interchangeably. The word, "Refugee," will be reserved for describing the legal status of a person who is entitled to special status or protections on account of being displaced or migrating.).

17 Black et al., *supra* note 13 (provide a comprehensive conceptual framework for thinking about the causes of environmental migration. It demonstrates the degree to which the concept of "environmental migration" is both a unique phenomenon and one of a variety of familiar migratory pressures.).

18 INTERNATIONAL ORGANIZATION FOR MIGRATION [IOM], MIGRATION, THE ENVIRONMENT AND CLIMATE CHANGE: ASSESSING THE EVIDENCE 14 (Frank Laczko and Christine Aghazarm eds. 2010), https://publications.iom.int/system/files/pdf/migration_and_environment.pdf; Betsy Hartmann, *Rethinking Climate refugees and Climate Conflict: Rhetoric, Reality and the Politics Of Policy Discourse*, 22 J. INT. DEV. STUDIES ASSOCIATION 233–246 (2010); Olivia V. Dun & François Gemenne, *Defining 'Environmental Migration'*, 31 FORCED MIGRATION REV. 10, 10 (2008); *see* James Morrissey, *Rural-Urban Migration in Ethiopia*, 31 FORCED MIGRATION REV. 28, 28–29 (2008).

ments of migration. The inability to isolate particular elements of water insecurity as direct and close to singular causes of migration does not show that it is not a real causal factor in migration, only that it is part of a complex story that includes both environmental and socio-economic and political pressures. That water insecurity is causally related to migration is relevant primarily as a premise in a larger argument about how we can appropriately respond to migration and its consequences. What we need to know about the relationship between water, climate, and migration is framed from the start by the policy discussion that follows it. Water migrants are moving both because they have an immediate need that they cannot fill through no or little individual fault because it either arises from natural scarcity or the collective contributions of humans to climate change. Nevertheless, their movement creates serious stresses on the communities they are leaving, passing through, and entering. What we want to know is how to resolve migrants' reasonable demand for better conditions and reasonable demands by others that their own conditions not be unfairly destabilized. Thus, we ought to be looking for links between water insecurity and migration which elucidate the basis for these demands and the way that they interact with the social forces that make movement and conflict attractive. This cannot be done by simply comparing levels of water access and the number of people who report moving. The value of any causal link between water insecurity and migration must be evaluated on the basis of whether it helps us better understand and respond to problems like this.[19]

There are a host of issues that deserve careful discussion at the intersection of climate migration and international law. Here I will focus on a narrower issue: what does water insecurity-related climate migration imply for border regimes across which migrants must pass?[20] If it is likely that water insecurity will lead to more displacement and human migration, an increasing number of people will have to cross borders to find more suitable places to live. Even without the additional inputs of climate change and water scarcity, migration pits the normative commitments of states to protect their citizens' entitlements to a share of domestic resources from non-citizens against the dire humanitarian needs of people who are perhaps badly off through no fault or choice of their own. There are several complicating issues, within this familiar problem of patriotic partiality, related specifically to climate change because the populations that are the main

[19] Wendy Jepson et al., *Advancing Human Capabilities for Water Security: A Relational Approach*, 1 WATER SECURITY 46, 50 (2017).

[20] By "climate migration" I mean the forced or voluntary movement of people resulting from the direct or indirect effects of climate-related environmental changes. This includes movement in response to things like storms and droughts, but does not include movement in response to, for example, industrial environmental degradation. This is a necessarily hazy distinction and particular cases are almost always up for debate in their relation to climate change because they result from discrete weather or scarcity events which precipitate movement, and not the general phenomenon of "climate change." By "border regime" I mean the collection of legal, political, and social mechanisms that establish and regulate the spatial borders between groups. Most commonly this refers to the actual national borders of a state which separate citizens of different countries. But it can also refer to sub-national institutional or even ethnic barriers that in some way constrain the free movement of people and define their life options. This is, again, a fuzzy concept, but it is important that it be able to capture the idea that a large amount of conflict over water resources happens at the sub-state level. MOORE, *supra* note 3 at 9, 62.

contributors to climate change are not necessarily the ones that must deal with its migration consequences most directly. Water insecurity, in particular, is complicating because the naturally uneven distribution of water on the planet can mean that scarcity is not any particular groups' fault. The very feature of water insecurity that makes it so compelling as a humanitarian case also makes it unclear who, from the perspective of international law, is responsible for ensuring greater water access.

What is clear, however, is that water insecurity is increasing globally. While significant progress has been made in drinking water access over the last fifteen years, the absolute numbers of people with poor water access are still very high. An estimated 663 million people have no access to drinking water sources within thirty minutes of their home.[21] Even if water sources are closer, they are often unsafe. An estimated two billion people drink from sources contaminated with human waste.[22] Waterborne disease affects more than 1.5 billion people every year, and its most common symptom, diarrhea, kills 1.2 million children annually.[23]

One of the obstacles to improving global water access is that demand for water has continued to rise at levels far exceeding the rate of population increase. This reflects not only population increases but the fact that humans are consuming more water per capita than they have historically.[24] Urban populations consume more water per capita both because their infrastructure tends to be more water intensive and because emerging middle-class wealth generates demand for personal goods and a diets which require more water to produce.[25] The high rates of urbanization and population growth across the developing world suggest a future of greater inter-sectoral competition for a decreasing stock of renewable water resources. These trends have already begun to strain global water resources. Over the last fifty years alone, global per capita freshwater availability has decreased by thirty-seven percent.[26] Many countries report rates of water consumption that far exceed their capacity for natural replenishment.[27]

---

21 UNICEF & WHO, *Progress on Drinking Water, Sanitation and Hygiene: 2017 Update and SDG Baselines*, at 3 (2017), https://www.unicef.org/publications/index_96611.html.

22 *Drinking-Water,* WHO (Feb. 7, 2018), http://www.who.int/news-room/fact-sheets/detail/drinking-water.

23 UNICEF, *supra* note 21; UNICEF & WHO, *Diarrhoea: Why Children Are Still Dying and What Can Be Done*, at 13, 20 (2009), http://www.who.int/maternal_child_adolescent/documents/9789241598415/en/.

24 WBG, TURBULENT WATERS: PURSUING WATER SECURITY IN FRAGILE CONTEXTS 28 (2017), http://documents.worldbank.org/curated/en/885171489432062054/Turbulent-waters-pursuing-water-security-in-fragile-contexts; Johan Rockström et al., *Future Water Availability for Global Food Production: The Potential of Green Water for Increasing Resilience to Global Change*, 45 WATER RES. 1, 5 (2009) https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2007WR006767.

25 Willa Paterson et al., *Water Footprint of Cities: A Review and Suggestions for Future Research*, 7 SUSTAINABILITY 8461, 8470 (2015).

26 Jennyfer Wolf et al., *An Exploration of Multilevel Modeling for Estimating Access to Drinking-Water and Sanitation*, 11 J. WATER & HEALTH 64, 64–77 (2013).

27 *Study: Third of Big Groundwater Basins in Distress*, NASA (June 16, 2015), http://www.jpl.nasa.gov/news/news.php?feature=4626.

The UN expects 1.8 billion people will live in regions facing critical water scarcity by 2025.[28] Longer term predictions are hard to verify because the effects of climate change are uncertain. But even without absolute certainty, it is well within reason to expect higher sea levels, more intense and frequent major storms, and more seasonable precipitation.[29] All three of these are likely to displace people in urban places in particular. The UN estimates that forty-four percent of the world's population lives within 150 kilometers of the coast and is likely to be affected by flooding and storms.[30] Coastal populations are growing rapidly in both Africa and China. Cities, and for that matter agriculture and heavy water infrastructure, are built where they are to exploit consistent water resources. The central threat of climate change in this context is that we are likely to see these water sources move away from the places we have invested in building. Over the long term, either water must be moved back to these locations or the populations themselves must move.

Climate migration is not a new phenomenon, but the intensity of research over the last thirty years has revealed a growing amount of displacement and voluntary movement related to environmental changes.[31] The Internal Displacement Monitoring Centre (IDMC) reports that between 2008 and 106, 227.6 million people were forced to move because of sudden natural disasters.[32] Slower changes with a longer timescale also appear related to migration rates and spikes in violence.[33] While there are wide differences in exact predictions depending on definitions of migration and climate change impacts, there is little question that millions of people will move, especially in Africa and Asia, in response to environmental changes over the next century.[34] The empirical research on the exact

---

[28] U.N. Water, *Managing Water under Uncertainty and Risk,* WWDR4, at 196 (2012), http://unesdoc.unesco.org/images/0021/002156/215644e.pdf; *see generally* FOA, *Coping with Water Scarcity: An Action Framework for Agriculture and Food Security* (2017), http://www.fao.org/docrep/016/i3015e/i3015e.pdf (acknowledging the significant problem of water scarcity and providing a conceptual framework to address food and water security).

[29] Kundzewicz et al., *supra* note 10, at 5.

[30] *Human Settlements on the Coast,* UN ATLAS OF THE OCEANS, http://www.oceansatlas.org/subtopic/en/c/114/ (last visited Sept. 28, 2018).

[31] *E.g.*, 31 FORCED MITIGATION REVIEW (Marion Couldrey & Maurice Herson eds. Oct. 2008), https://reliefweb.int/report/world/forced-migration-review-no-31-climate-change-and-displacement (collecting articles regarding climate change and displacement); Warner et al., *supra* note 13; Toscano, *supra* note 13; ETIENNE PIGUET, NEW ISSUES IN REFUGEE RESEARCH: CLIMATE CHANGE AND FORCED MIGRATION, RESEARCH PAPER NO. 153 (UNHCR Jan. 2008); Naser, *supra* note 16; Norman Myers, *Environmental Refugees: A Growing Phenomenon of the 21st Century,* 357 PHIL. TRANS. OF THE ROYAL SOC. 609, 609–613 (2002).

[32] INTERNATIONAL MONITORING DISPLACEMENT CENTRE, GLOBAL REPORT ON INTERNAL DISPLACEMENT (May 2018), http://www.internal-displacement.org/global-report/grid2018/downloads/2018-GRID.pdf.

[33] *See generally* Alex Evans, *Resource Scarcity, Climate Change and the Risk of Violent Conflict,* World Development Report Background Paper (2011) (assessing how natural resource scarcity and global climate change may alter the risk of violent conflict in the future); *compare* Ragnhild Nordås & Nils Petter Gleditsch, *Climate Change and Conflict,* 26 POL. GEOGRAPHY 627, 635 (2007) (asserting, "While it is possible that climate change may lead to more conflict in the future, it has not so far caused a reversal of the current trend towards a more peaceful world.").

[34] Frank Biermann & Ingrid Boas, *Protecting Climate Refugees: The Case for a Global Protocol,* 50 ENV'T: SCIENCE & POL'Y FOR SUSTAINABLE DEV. 8, 10 (2011), https://www.tandfonline.com/doi/abs/

numbers of expected migrants is controversial and shows wide variations both because it is a prediction based on an uncertain future and because the methodology of studies is inconsistent.[35] It is a mistake, however, to take this as a reason to ignore the phenomenon. The range of predictions, while wide, has about twenty-five million people displaced on even the most conservative estimates.[36] Even if the number of people who will actually move are on the low end of predictions, there are strong policy and legal reasons for anticipating this will be a continuing problem which deserves thoughtful planning to avoid the worst outcomes. It is also a mistake to think of displacement as a future eventuality when there are currently tens of millions of people who are reasonably classified as environmental migrants.[37]

b. Population Vulnerability

Under what conditions does water insecurity cause people to move? The large number of attempts to describe the causes and conditions of environmental migration yield a few common categories for assessing the causes of displacement.[38] These are significant for the law and moral justifications for intervention because they pick out different relationships between peoples' decisions to move, the nature of the environmental conditions, and the scope of their consequences. Roughly, these categories include people who are:

i. Displaced by rising sea levels

ii. Displaced by sudden-onset disasters including hurricanes, flooding, heat, and drought

iii. Displaced by progressive degradation in water quantity or quality essential for meeting basic needs

iv. Displaced by a sudden or progressive increase in the number of people arriving as a result of migration from elsewhere, which results in new water stress in the host community

(i) and (ii) are distinguished by their timescale and the permanency of relocation. (iii) is distinguished from (ii) by timescale and permanency. In the case of saltwater intrusion, (iii) might be caused by (i), but it emphasizes displacement related to quality and availability rather physical displacement by rising water. (iv) is distinguished from the rest by the fact that it is caused by migration from

10.3200/ENVT.50.6.8-17#aHR0cHM6Ly93d3cudGFuZGZvbmxpbmUuY29tL2RvaS9wZGYvMTAuMzIwMC9FTlZULjUwLjYuOC0xNz9uZWVkQWNjZXNzPXRydWVAQEAw.

35 *Id.;* Black et al., *supra* note 13; Naser, *supra* note 16.

36 Dana Zartner Falstrom, *Stemming the flow of environmental displacement: creating a convention to protect persons and preserve the environment*, 13 COLO. J. INT'L ENV'T. L. & POL'Y 1, 4 (2002).

37 *Id.*

38 *E.g.*, Naser, *supra* note 16; Myers, *supra* note 31; PIGUET, *supra* note 31; Warner et al., *supra* note 13; Reuveny, *supra* note 13; FABRICE G. RENAUD ET AL., CONTROL, ADAPT OR FLEE: HOW TO FACE ENVIRONMENTAL MIGRATION? No. 5/2001 (2007); U.N. Office for the Coordination of Humanitarian Affairs et al., *Monitoring Disaster Displacement In The Context Of Climate Change* (Sept. 2009), http://www.internal-displacement.org/sites/default/files/publications/documents/200909-monitoring-disaster-displacement-thematic-en.pdf.

somewhere else. It is also the least common but expected to become more common over time as global conditions deteriorate.[39] There is no question that the distinctions between these are less-than-firm, but they are worth separating, at least intellectually because each requires different tactics for resiliency and recovery.

Migration is, for many, an adaptation strategy. Given the conditions that water migrants are leaving, it holds the potential to improve the quality of their life. This depends, however, on finding sustainable and stable conditions into which to move. A large enough influx of migrants to a water secure area can run the risk of turning it into a water insecure one. The Syrian civil war has been cited extensively as a case in which poor water policy contributed to conflict and internal migration by heavily subsidizing water extraction on the eve of a profound drought, leading to agricultural collapse.[40] Internal population and dissatisfaction with the government precipitated conflict, and the following civil war produced massive external migration into Jordan, Syria's southern neighbor. Jordan has its own serious water access issues. It is one of the driest countries in the world, with per capita water availability of about 125 L/day, which is already below the global average of 200-300 L/person/day.[41] The Zaatari refugee camp contained more than 80,000 registered refugees in northern Jordan, becoming one of the country's largest cities. While the National Water Strategy, produced before this wave of refugees arrived, planned for greater water security in Jordan by 2022, it was based on a population projection that was exceeded rapidly once refugees began arriving. This sort of case in which migration—whatever its cause—contributes to water insecurity in the host community is likely to be repeated in the many places globally where scarcity is geographically broader than any one political border. Water insecurity is, in sum, both cause and effect of migration.[42]

The linear story about scarcity, environmental degradation, migration, and conflict is certainly attractive and compelling. The problem is that it is almost certainly too simplistic to be correct. Scarcity, even deep and chronic scarcity, is

---

[39] Reuveny, *supra* note 13.

[40] Peter H. Gleick, *Water, Drought, Climate Change, and Conflict in Syria*, 6 WEATHER, CLIMATE, & SOCIETY 331, 331–340 (2014); Francesca De Châtel, *The Role of Drought and Climate Change in the Syrian Uprising: Untangling the Triggers of the Revolution*, 50 MIDDLE EASTERN STUDIES 521, 521–535 (2014); Colin P. Kelley et al., *Climate change in the Fertile Crescent and implications of the recent Syrian drought*, 112 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 3241, 3241 (2015); Marcus DuBois King, *The weaponization of water in Syria and Iraq*, 38 THE WASHINGTON QUARTERLY 153, 153–169 (2015); John Wendle, *Syria's Climate Refugees.*, 314 SCIENTIFIC AMERICAN 50, 50 (2016); Kitty van der Heijden, et al., *Beyond Conflict, Water Stress Contributed to Europe's Migration Crisis*, WORLD RESOURCES INSTITUTE (Nov. 3, 2015), https://www.wri.org/blog/2015/11/beyond-conflict-water-stress-contributed-europe-s-migration-crisis (last visited Sep 27, 2018); Michael Tiboris, *Jordan's Water Woes, Are a Wellspring of Mideast Strife*, THE NATIONAL INTEREST (Dec. 11, 2015), https://nationalinterest.org/feature/jordans-water-woes-are-wellspring-mideast-strife-14579.

[41] Kevin Watkins et al., HUMAN DEVELOPMENT REPORT 2006, (UNDP 2006), http://hdr.undp.org/sites/default/files/reports/267/hdr06-complete.pdf; Jordanian Ministry of Water and Irrigation, *Jordan Water Sector Facts and Figures*, USAID, https://jordankmportal.com/resources/jordan-water-sector-facts-and-figures-1 (last visited Oct. 8, 2018).

[42] Tobias Hagmann, *Confronting the Concept of Environmentally Induced Conflict*, 6 PEACE, CONFLICT & DEV. 1, 1–22 (2005); PIGUET, *supra* note 31; Ashok Swain, *Environmental Migration and Conflict Dynamics: Focus on Developing Regions*, 17 THIRD WORLD QUARTERLY 959, 959–974 (1996).

not by itself a predictor of water conflict or water migration.[43] The direct connection between low water access and migration is not a good model for thinking about water migration.[44] This significantly complicates the account given above. Contemporary research on this topic has begun to shift, rightly, toward more complex models of environmental displacement as well as an emphasis on case studies, rather than global assessments, which incorrectly suggest an easy-to-understand uniformity in environmental migration.[45] The particular problem this research identifies is that environmental change is treated as an acute "hazard."[46] The sense that this is inadequate is already present in the effort to distinguish hazards that have shorter and longer timescales, but this seems to miss the point that migration is inextricably a social phenomenon and rarely has the linear character of hazard to expulsion.[47] To take the more complex analytical approach suggests that environmental change is a contributing element of migration decisions that cannot reasonably be separated from other sorts of migration decisions. Developing models for treating water migration as a distinct sort of hazard that increases vulnerability for migration independently of social, economic, and political conditions is attractive only as a simplified media narrative. Alternative models are empirically messy but improve our ability to identify vulnerable populations and, as I will argue below, influence the way in which water migration should be understood by legal frameworks.

Rejecting a linear, hazard-based account of water migration does not mean that we cannot identify any meaningful and useful patterns in water insecurity and human migration. Instead, it means that these pathways must be treated as mechanisms which are inconsistently and variably present but nevertheless significant for understanding people's decisions to migrate and how we ought, legally, practically, and politically, to respond to them. This provides a "toolbox" for understanding water migration rather than universal constants in their causation. Black *et al.*, identify five rough drivers of migration which are useful for framing these mechanisms—economic, political, demographic, social, and environmental.[48] Poverty is the main concern when it comes to water access and exposure to disasters. The global poor have the highest rates of water insecurity and overwhelmingly bear the brunt of the destabilizing consequences of poor

[43] Moore, *supra* note 3; Aaron T. Wolf, *Conflict and Cooperation Along International Waterways*, 1 WATER POL'Y 251, 251–265 (1998).

[44] Black et al., *supra* note 13.

[45] *See generally* Warner et al., *supra* note 13; Sabine L. Perch-Nielsen et al., *Exploring the Link Between Climate Change and Migration*, 91 CLIMATIC CHANGE 375, 375 (2008); Black et al., *supra* note 13; Edward R. Carr, *Placing the Environment in Migration: Environment, Economy, and Power in Ghana's Central Region*, 37 ENV'T & PLANNING A 925, 925–946 (2005). *See also* Sarfaraz Alam, *Environmentally Induced Migration from Bangladesh to India*, 27 STRATEGIC ANALYSIS 422, 422–438 (2003); Alisson Flavio Barbieri & Ulisses EC Confalonieri, *Climate Change, Migration And Health: Exploring Potential Scenarios of Population Vulnerability in Brazil*, MIGRATION & CLIMATE CHANGE 49, 49–73 (2011); Sabine Henry et al., *Modelling Inter-Provincial Migration in Burkina Faso, West Africa: The Role Of Socio-Demographic and Environmental Factors*, 23 APPLIED GEOGRAPHY 115, 115–136 (2003).

[46] Black et al., *supra* note 13, at S4.

[47] *Id.*; Jepson et al., *supra* note 19.

[48] Black et al., *supra* note 13, at S6-S7.

water access.[49] Government policy has direct effects on water security as well. Decisions to privilege polluting industries, or unsustainable patterns of agricultural water usage, have a direct impact on social stability and migration.[50] Population movement and competition between groups over declining water supplies are essentially political problems where management of shared resource is inadequate. "Social drivers" describe patterns of migration created by social connections between places, which make them attractive pathways for any sort of migration. An example of this is historical migration to the United States in which immigrants formed ethnic neighborhood communities in American cities, attracting increasing numbers of immigrants from that particular ethnic group. But it also includes economic pathways of remittances, which can make physical migration more or less likely in the place receiving them.[51] Finally, environmental drivers are the physical ecosystem conditions which include at least items (1) – (3) in the "hazard" analysis. The dramatically increased complexity of this framework allows us to avoid some problems for understanding water migration, but it creates others.

For example, it helps explain why we should not expect to see migration as a necessary upshot of water scarcity. Societies with a cultural history of confronting water scarcity have found ways to adapt to those conditions.[52] This stability is often hard fought and tenuous. The fact that living with scarcity becomes, of necessity, a part of the population's cultural identity has the potential to transform technical changes in supply into a cultural affront. This is apparent in places like Egypt, which almost totally dependent on the Nile for its water.[53] Upstream development of the Blue Nile, especially by Ethiopia, has become a tense diplomatic challenge that the Egyptian government regards as an existential threat. In other places, an abundant water supply is not enough to prevent migration and conflict. In fact, both unusually high rain intensity and the *perception* of unusual seasonal water availability are positively correlated with conflict and militant activity. But too much rain at the wrong times also has the capacity to cause food insecurity-linked migration.[54] Whether the issue is scarcity or unusual abundance, the connections between environmental conditions and human behavior depend on understanding the social conditions which make scarcity a vulnerability.

On the other hand, the more complex analysis of environmental migration makes it difficult to argue that water migration, or even environmental migration more broadly, is a special case which deserves unique sorts of legal protection. If almost any individual putative case has to be understood as irreducibly linked to

---

[49] UNICEF, *supra* note 21.

[50] Jeffrey D. Sachs, *supra* note 13.

[51] Black, *supra* note 13.

[52] Colin H. Kahl, *supra* note 11.

[53] Richard Kyle Paisley, *Why the 11 countries that rely on the Nile need to reach a river deal soon,* THE CONVERSATION (Aug. 27, 2017), http://theconversation.com/why-the-11-countries-that-rely-on-the-nile-need-to-reach-a-river-deal-soon-75868.

[54] Devlin &. Hendrix, *supra* note 2.

some social, demographic, economic, or political conditions, it is unclear what separates it from other forms of migration. This, I think, may turn out to be a blessing if properly understood. But before turning to the reasons for this, it is worth noting one other set of patterns that emerge from the environmental migration literature.

While the drivers of migration are necessarily complex, two main features seem to tip water insecurity caused by some combination of them into the sort of social unrest that encourages migration. The first is *rapid physical changes in supply*.[55] These can be caused by natural changes in precipitation—including droughts, floods, and salt water incursion.[56] But rapid supply changes can also result from human activity—for instance, industrial pollution, infrastructure construction, policy changes, and violence. Rapid changes are more significant than baseline abundance or scarcity in predicting migration. The second factor is *poor governance*.[57] The social, political, and economic conditions under which people live determine whether physical water scarcity is water insecurity. This is apparent when considering the differences in the capacity to recover from drought in places like South Africa, Afghanistan, and the United States. Successful recovery from disasters depends on a well-organized response and prepared, resilient, and adaptable institutions. Rapid physical changes in the environment are less destabilizing when the conditions of good governance are present. Poor governance is actually likely to weaken the ability of a population to remain resilient during sharp supply changes, deepening the consequences of acute and sudden scarcity.[58]

The main vector for water-specific migration, on this analysis, runs through sudden-onset disasters and progressive deterioration of water resources that cause water and food insecurity linkage, especially for water-ecosystem dependent livelihoods in agriculture and fisheries.[59] Whether water resource degradation will result in migration depends on the "meso level" features of water management, institutional governance, and whether threatened communities can cooperate and negotiate with better-off neighboring populations.[60] Even if a population does not move to find new water sources, people, especially men, may travel to new locations to find work. These rates of internal movement rise notably during and after drought and flood events.[61] Among the leading causes of displacement is poor

---

[55] Chellaney, *supra* note 3; Busby, *supra* note 3; *Troubled Waters: The Effects of Scarcity on Interests, Identities, Conflict and Cooperation, in* THE MULTICULTURAL DILEMMA: MIGRATION, ETHNIC POLITICS, AND STATE INTERMEDIATION (Michelle Hale Williams ed. 2013); WBG, *supra* note 24.

[56] *See* Devlin and Hendrix, *supra* note 2 (Interestingly, there is some evidence that it is both weather variability and *perception* of weather variability which most directly influence civil unrest.).

[57] Wolf, *supra* note 43; WBG, *supra* note 24.

[58] M. Miletto et al., *supra* note 13.

[59] Black, et al., *supra* note 13.

[60] *Id.*; Miletto et al., *supra* note 13.

[61] Clark Gray & Valerie Mueller, *Drought and Population Mobility in Rural Ethiopia*, 40 WORLD DEV. 134, 134–145 (2012); Tamer Afifi, *Economic or Environmental Migration? The Push Factors in Niger*, 49 INT'L MIGRATION (2011); Sabine Henry et al., *The Impact of Rainfall on the First Out-Migration: A Multilevel Event-History Analysis in Burkina Faso*, 25 POPULATION & ENV'T 423, 423–460 (2004)

access to fresh water.[62] Many other common causes of displacement, such as food insecurity, are substantially related to changes in water availability. The International Food Policy Research Institute projects substantial declines in rice and maize productivity by 2050 related to climate change via heat, more seasonality, frequent extreme storms, drought, and flooding—all of which are water-agriculture interactions.[63]

Finally, it is also worth noting that the negative effects of both water insecurity and displacement are not uniform even within the migrant population. Women are especially vulnerable.[64] When water access is poor, they spend a huge amount of time collecting water, which is physically taxing work that reduces their ability to be economically productive. This task begins early in life and disproportionately includes girls, who are prevented from attending school by water collection duties and because the schools themselves lack adequate sanitation facilities.[65] Water insecurity also has disparate psychological effects. Women register much higher levels of emotional stress and anxiety about water insecurity and tend to be more water insecure than other members of even the same household.[66]

c. Mechanisms Governing Water Migration

Water migration, and climate migration more broadly, has elements of both forced and voluntary migration that make it difficult to subsume under existing international legal mechanisms. The complexity of the evolving conceptual analysis above has important consequences for the legal treatment of water migrants. Adequately responding to higher volumes of water security-related migration requires simultaneously acknowledging this complexity while providing something closer to clear guidance that can inform law and policy at the international level as populations become more mobile.

In the common analysis, there are roughly three overlapping categories of displacement—those temporarily displaced by sudden-onset disasters, those permanently displaced because of or to avoid major environmental disruptions, and those displaced by progressive degradation of environmental conditions.[67] Within each of these, but the third most clearly, conditions of social and eco-

---

[62] Toscano, *supra* note 13.

[63] Gerald C. Nelson et al., FOOD SECURITY, FARMING, AND CLIMATE CHANGE TO 2050: SCENARIOS, RESULTS, POLICY OPTIONS (International Food Policy Research Institute 2010).

[64] Maitreyi Bordia Das, THE RISING TIDE: A NEW LOOK AT WATER AND GENDER (WBG 2017).

[65] Jay P. Graham et al., *An Analysis of Water Collection Labor Among Women and Children in 24 Sub-Saharan African Countries*, PLOS ONE (June 1, 2016).

[66] Sera L. Young et al., *Household Food Insecurity, Maternal Nutritional Status, and Infant Feeding Practices Among HIV-Infected Ugandan Women Receiving Combination Antiretroviral Therapy*, 18 MATERNAL AND CHILD HEALTH J. 2044, 2044–2053 (2014); Elijah Bisung & Susan J. Elliott, *Psychosocial impacts of the lack of access to water and sanitation in low-and middle-income countries: a scoping review*, 15 J. OF WATER AND HEALTH 17, 17–30 (2017).

[67] Naser, *supra* note 16; El-Essam Hinnawi, *Environmental refugees*, *in* ENVIRONMENTAL REFUGEES, (1985); RENAUD ET AL., *supra* note 38. The fourth category above, displacement by the displaced, has yet to receive much attention.

nomic vulnerability complicate the degree to which environmental conditions are the most direct cause of migration. Labor migration, for instance, may have been a common strategy to cope with poverty, but a progressively degraded environment can reduce the effectiveness of the strategy over time resulting in cycles of more permanent migration.[68]

The fact that water migration has elements of both force and voluntary adoption is significant for its legal status. Moreover, the causes of migration have both political and environmental origins. This, as others have noted, makes trouble for the idea of including environmental migrants under the heading of "refugees."[69] The concept of an "environmental refugee" "naturalizes the economic and political causes of environmental degradation and masks the role of institutional responses to it."[70] In emphasizing the environment as a cause it seems to deemphasize the powerful role that governance plays in creating environmental problems and mitigating their effects. It also suggests that "forced" migration must stem, more or less directly, from persecution, and that the legally significant sort of movement is only that which crosses some politically recognized (especially international) border.[71] Neither of these accurately describe climate migrants. The status of environmental refugees is not reducible to this definitional squabble, however. It represents an evolving set of legal considerations where the question is whether to expand a category (and hence both responsibility and remedy) or to create a new category altogether for a set of circumstances that are unique enough not to fit within existing frameworks.[72] The global scale of environmental change, the fact that (while it includes acute disasters) it is persistent and non-episodic, and the reality that human activities are part of its causal origin as well as the ability to stop it, all make climate induced migration a special case.[73] The viability of "environmental refugees" and the sub-group "water refugees" as a group with special rights seems to depend on unraveling several competing narratives about responsibility packed into these concepts. Another way to put the question here is to ask whether legal responses to climate migration ought to follow the academic assessment into the wilderness of greater complexity that an adequate empirical story about the causes of migration requires.

There is currently no broadly accepted international legal definition for either "environmental migrant" or "environmental refugee." The term "environmental refugee" first appears in a 1985 UN Environment Program report, which defined environmental refugees as those "who have been forced to leave their traditional habitat. . .because of a marked environmental disruption. . .that jeopardized their

---

68 El-Hinnawi, *supra* note 67.

69 Rina Kuusipalo, *Exiled by Emissions-Climate Change Related Displacement and Migration in International Law: Gaps in Global Governance and the Role of the UN Climate Convention*, 18 VT. J. ENV'T L. 614, 614 (2016); Naser, *supra* note 16; PIGUET, *supra* note 31.

70 Hartmann, *supra* note 18.

71 Swain, *supra* note 42, at 965.

72 I leave aside another possible view—that we are not describing any real phenomenon and so both the concept and responsibility can be safely ignored by the law.

73 Warner, *et al. supra* note 13, at 691-692.

existences and/or seriously affected the quality of their life."[74] This definition sparked several points of disagreement, including disagreements over the terminology ("refugee" or "migrant" or "displaced person"); bright lines for involuntary and voluntary migration as well as environmental and non-environmental factors; and differential protections for sudden and slow-onset events.[75] Among these conversations, initial discussions focused on whether affected populations were likely to eventually return to their homes.[76] This was already a departure from the 1951 United Nations Convention on Refugees, which, along with the 1967 Protocol Relating to the Status of Refugees, identified four essential features of a refugee in Article 1(A)(2)—they must be (1) outside their country of nationality, (2) unable or unwilling to seek protection from their home country (3) as a result of a reasonable fear of persecution (4) on the basis of race, religion, nationality, social membership, or political opinion.[77] Whether environmental migrants are moving voluntarily or are being forced by water insecurity cross-cuts this definition, which is manifestly too narrow to address them even if we acknowledge that at least some of the sources of water insecurity are political. Crafted with World War II in mind, the definition turns on the key requirement of persecution, which the international community has agreed environmental migrants do not meet. The UN High Commissioner for Refugees Handbook explicitly states that the lack of persecution "rules out such persons as victims of famine or natural disaster."[78]

The 1969 Organization of African Unity/African Union Convention and the 1984 Cartagena Declaration on Refugees both explicitly extend the relevant causes of movement in the definition of "refugee" to include people fleeing "events seriously disturbing public order."[79] This would seem to allow disruptions caused by environmental degradation, but neither has been clearly invoked to address movement for environmental reasons. In the case of the Cartagena Declaration, it was amended specifically to limit its ability to do so.[80]

Beyond refugee status, there are some existing yet limited legal protections that may assist with climate-induced migration and displacement. For example, Environmental migrants might attempt to seek protection as internally displaced

---

[74] El-Hinnawi, *supra* note 67; Bonnie Docherty & Tyler Giannini, *Confronting a Rising Tide: A Proposal for a Convention on Climate Change Refugees,* 33 HARV. ENV'T. L. REV. 349, 349 (2009).

[75] Biermann & Boas, *supra* note 34.

[76] David Keane, *The environmental causes and consequences of migration: a search for the meaning of environmental refugees,* 16 GEO. INT'L ENVTL. L. REV. 209, 210 (2003).

[77] United Nations Convention Relating to the Status of Refugees Ch. I Art. 1(A), Jul. 28, 1951, 189 U.N.T.S. 137; United Nations Protocol Relating to the Status of Refugees, Jan. 31, 1967, 606 U.N.T.S. 267.

[78] UNHCR, Handbook on Procedures and Criteria for Determining Refugee Status under the 1951 Convention and the 1967 Protocol relating to the Status of Refugees, U.N. Doc. HCR/IP/4/Eng/REV.1, (Jan. 1992), http://www.unhcr.org/4d93528a9.pdf; Toscano, *supra* note 12.

[79] Org. of African Unity [OAU], Convention Governing the Specific Aspects of Refugee Problems in Africa art. 1(2), Sept. 10, 1969, 1001 U.N.T.S. 45; Colloquium on the Protection of Refugees in Central America, Mexico, and Panama, Declaración de Cartagena art. 3, Nov. 22, 1984.

[80] Keane, *supra* note 77, at 216.

persons, governed by the UN Guiding Principles on Internal Displacements. The Guiding Principles categorize internally displaced persons as:

"[P]ersons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights or natural or human-made disasters, and who have not crossed an internationally recognized State border."[81]

Despite its clear inclusion of environmental migration, the Guiding Principles are limited in application to displacement within a country rather than migration from one country to another. Moreover, the Guiding Principles call on states to take responsible action when managing internal displacement but do not provide further technical or financial assistance to aid the effort, effectively nullifying their impact.[82]

Another potential avenue is the 1954 Convention relating to the Status of Stateless Persons, which protects people "not considered as a national by any State under operation of its law."[83] Though it may potentially apply to citizens living on land disappearing due to sea level rise, the Convention has only been signed by 23 countries and outlines few rights to those who are stateless.[84] Similarly, the 1990 International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families and the 1986 UN Declaration on the Human Rights of Individuals who are Not Nationals of the Country of Which They Live do not have either broad ratification or clearly defined rights.[85] Some of the goals of protecting the water insecure (whatever the cause) may also be found in declarations of the human right to water.[86] The UN Committee on Economic, Social and Cultural Rights links the right to water with the general right to adequate standards of living:

"The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses."[87]

Meanwhile, the UN General Assembly Resolution states that:

---

81 U.N. Comm'n on Hum. Rts., Rep. of the Secretary-General Pursuant to Resolution 1997/39 on its Fifty-Fourth Session, U.N. Doc. E/CN.4/1998/53/Add.2 (Feb. 11, 1998).

82 Toscano, *supra* note 12.

83 ESCOR, U.N. Res. 526 A(XVII) (Apr. 26, 1954).

84 Toscano, *supra* note 12.

85 *Id.*

86 Peter H. Gleick, *The Human Right to Water*, 1 WATER POLICY 487, 487 (1998); Peter H. Gleick, *The Human Right to Water,* PACIFIC INSTITUTE (2007), http://smtp.wecalc.org/reports/human_right_may_07.pdf; S.M. SALMAN & S. MCINERNEY-LANKFORD, WORLD BANK GROUP [WBG], THE HUMAN RIGHT TO WATER: LEGAL AND POLICY DIMENSIONS. LAW, JUSTICE, AND DEVELOPMENT (2004); STOCKHOLM INT'L WATER INST., THE HUMAN RIGHTS TO WATER AND SANITATION AND THE HUMAN RIGHTS-BASED APPROACH (2016); INGA T. WINKLER, THE HUMAN RIGHT TO WATER (2012); *see* G.A. Res. 51/229, (Apr. 11, 1997); *see* Ariel Litke & Alistair Rieu-Clarke, *The UN Watercourses Convention: A Milestone in the History of International Water Law,* GLOBAL WATER F. (2015), http://www.globalwaterforum.org/2015/02/02/the-un-watercourses-convention-a-milestone-in-the-history-of-international-water-law/.

87 U.N. Comm. on Econ., Soc. and Cultural Rights, *General Comment No. 15: The right to water (arts. 11 and 12 of the Covenant)*, U.N. Doc. E/C.12/2002/11 (Jan. 20, 2003).

"The right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights; [and] calls upon States and international organizations to provide financial resources, capacity-building and technology transfer, through international assistance and cooperation, in particular to developing countries, in order to scale up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all. . ."[88]

The typical goal of human rights in this context is their "progressive realization" through national level laws.[89] Human rights thus impose fairly discrete obligations for, at least, the nation states that are party to the covenant.[90] The existence and obligatory force of such a right, however, is not believed to be contingent on the existence of these laws.[91] As such state-level laws do not create the right, they are the mechanism by which states fulfill their obligations to respect and protect them.[92] One benefit of this approach to extending legal protections to water insecure people is that it makes no explicit reference to borders. This is valuable because much of what we would identify as water migration is sub-national and internal, and thus harder to fit under the framework of refugee protocols.

Given this background, there are no obviously good options for integrating environmental migrants into existing international legal frameworks. The most straightforward options are (1) expanding the definition of "refugee," (2) creating a new legal category of "climate refugee," (3) finding ways to respond to climate pressures under the existing definition, or (4) denying climate refugees a legal status. Expanding the definition risks watering down protections for traditional political refugees. The specificity of the definition in the UN Refugee Convention contributes to its value as a tool for protecting migrating populations because it runs less risk of outright rejection by states with an interest in preventing that migration that would be likely to argue that their right to enforce their borders cannot be open to such broad interpretation. There is fairly steady and increasing pressure by developed states to limit refugee status, so a further expansion seems politically unfeasible.[93] Moreover, expanding the international definition of refugee could well be used as cover by national governments accused of causing displacement to de-politicize the causes of the migration, blaming climate change, and hence expanding responsibility beyond its borders. Even if these

---

[88] GA Res. 64/292, at 2 (Aug. 3, 2010).

[89] The Rt Hon Lady Justice Arden, *Water for All? Developing a Human Right to Water in National and International Law*. 65 INT'L & COMP. L.Q. 771, 785-86 (2016).

[90] *See* Erik B. Bluemel, *The Implications of Formulating a Human right to Water,* 31 ECOLOGY L.Q. 957, 957 (2004) (These include obligations to respect the right (by not preventing its realization), to *protect* the right (by preventing third parties from preventing its realization), and to fulfill the right or "facilitate enjoyment of the right [and] promotion of the right through education measures, and provision of the right where individuals or groups cannot realize the right due to insufficient personal means."); Arjun K. Khadka, *The Emergence of Water as a 'Human Right' on the World Stage: Challenges and Opportunities*, 26 INT'L J. WATER RESOURCES DEV. 37, 37 (2010).

[91] Brunner et al., *The Human Right to Water in Law and Implementation,* 4 LAWS 413, 414 (2015).

[92] Malcolm Langford, *The United Nations Concept of Water as a Human Right: A New Paradigm for Old Problems?*, 21 INT'L J. WATER RESOURCES DEV. 273, 277 (2005).

[93] Biermann & Boas, *supra* note 33.

attempts are undertaken in bad faith, they are more or less prevented by the traditional definition.[94]

The second option is to create a new category altogether. This would reflect the reality that climate change, as a vector for migration, has become an intense enough pressure that it deserves its own legal status. The major obstacle to this at the moment is the lack of political support for the idea. Getting the international community to take collective responsibility for anthropogenic harm to the environment has been less than successful, and it seems unlikely that collective responsibility for the consequences of that harm is in the offing. As a conceptual matter, this is also unattractive because it requires distinguishing the environmental factors and political factors in migration in ways inconsistent with our best scientific understanding of their deep relationship. This may suggest the third option, i.e. finding ways to treat individual cases of putative environmental migration as instances of the political persecution definition within the UN Refugee Convention. This might be done by noting the fact that environmental degradation often has social and political origins. However, it is much harder to establish that they result from persecution. Worse still, there is no plausible way in which environmental harms caused by climate change are aimed at specific racial, religious, or political groups. Even if it turns out that, because poverty and climate vulnerability are related, the effects of climate change are distributed in socially unfair ways, this is far from showing that responsibility for this harm can be attributed to anyone in particular. A final option is to simply reject the idea that climate refugees ought to be given a special legal status at all. This is unattractive if predictions about the scale of the climate migrant challenge are even remotely correct. However, given the difficulty of expanding or supplementing international legal mechanisms, it might be best to export responsibility for responding to environmental migrants to human rights law and the international aid institutions working to limit the effects of climate change on vulnerable populations. None of these responses stand out as settling the issue, which underscores the need for more work on the topic.

III: Discussion

a. Water and Rights

The geography of water and the geography of national political boundaries frequently do not coincide. There are 145 countries that share surface water, 286 international river and lake basins, and 274 shared underground freshwater basins.[95] Thirty-three countries have more than 95% of their territory in a shared basin. In places where borders disregard the geography of water basins, they tend to be defined by them directly—such as when a river forms the border between nations or sub-national territories. When considered alongside the conclusions above—that water insecurity will increase as a result of climate change and en-

[94] Keane, *supra* 77, at 218.

[95] Transboundary Waters Assessment Programme - RIVER BASINS COMPONENT, http://twap-rivers.org/.

courage human migration, and that there are no satisfactory international protocols for handling this movement—we face some difficult legal and policy questions about how to proceed. This section discusses the potential conflict between conceptions of rights to water and the authority of a state to prevent immigration.

It is worth noting that water is somewhat special case of resource depletion. Water insecurity of the sort that encourages migration typically builds over a long time, unmitigated by governance, and becomes suddenly pressing through an acute event, such as a drought.[96] The difference between water insecurity migration and displacement by disaster is that migrants are unlikely to return home. Desertification, which is the extreme version of this, prevents large-scale population return.[97] However, even less permanent conditions can make returning unlikely. The vast majority of water globally is used for agriculture, which in turn employs a large portion of the world's population.[98] Consistent disruption of reliable water resources for farming is a migratory pressure that is difficult to reverse. Second, improving water access is an expensive and technically difficult project. While a portion of the world's water insecure population are dealing with increasing physical scarcity of environmental water, many places lack adequate water infrastructure which would help them make available natural water resources accessible. The expense of building catchment and piped infrastructure for very poor populations has kept access rates low even in regions with decent renewable water supplies.[99] Third, the uneven distribution of water on the planet is largely a natural phenomenon for which humans are not responsible.[100] While one might argue that the global distribution of wealth and political power is unjust in various ways and influences a population's ability to make use of the resources that surround it, no one is responsible for the natural distribution of the resources themselves. This is significant because, even though global consumptive freshwater use is competitive (i.e. my consumption reduces the immediately available stock for others), this only really affects people within the same basin. There are reasons to object to overconsumption in the Great Lakes region, but not because they directly reduce the stock of resources for people in Nigeria.

Despite these special challenges, there is a broadly accepted sense that people have something akin to rights claims on water resources.[101] This is central to an

---

[96] *See* Steduto et al., *supra* note 27.

[97] *See generally*, Thomas Hammer, *Desertification and Migration: A Political Ecology of Environmental Migration in West Africa*, *in* 20 ENVIRONMENTAL CHANGE AND ITS IMPLICATIONS FOR POPULATION MIGRATION 231 (Martin Beniston ed., 2004).

[98] Gleick, *supra* note 7.

[99] World Bank Group [WBG], *High and dry: Climate change, water, and the economy* 21 (2016), http://www.worldbank.org/en/topic/water/publication/high-and-dry-climate-change-water-and-the-economy.

[100] It is worth asking whether human activity via global warming has altered water availability in ways that call the "naturalness" of this distribution in to question, so I will return to this in the next section. Large scale interbasin transfers are also a potential exception, but they are relatively rare.

[101] Inga T. Winkler, THE HUMAN RIGHT TO WATER: SIGNIFICANCE, LEGAL STATUS AND IMPLICATIONS FOR WATER ALLOCATION (Reprint edition ed. 2014); Salman M. A. Salman & Siobhan McInerney-Lankford, *The Human Right to Water: Legal and Policy Dimensions*, WORLD BANK, 2004; Benjamin Mason

adequate response to climate migration across borders, which present a conflict between rights claims. A state's authority to make decisions about immigration and to protect its citizens' claims to natural resources within the territory is challenged by apparently more general individual rights claims to water resources necessary for life. It is a common sentiment that there is a human right to at least basic access to freshwater to meet daily needs.[102] The basis for this human right is largely moral at present, though as noted above, there have been efforts to provide it with legal status.[103] The basic view holds that there is a right to water because it is constituent to a right to life.[104] Water of sufficient quantity and quality is necessary for living and, the reasoning goes, if we have a legally protected right to life, we must have a concomitant right to things directly necessary for life.

There are several significant problems for this line of reasoning, however. One is that it seems to establish only that people have a right not to be denied access to water that they need to live. That is, it does not establish that they have a right to some quantity of water. If correct, this leaves out a large number of the cases we care about—in which water access is naturally low, depleted over time, or caused by natural disasters. Some will argue that human rights are not necessarily limited to negative rights (of non-interference), but this raises some difficult questions about what one is entitled to and whose responsibility it is to provide it. Tying the right to water to the right to survival only secures a right to a very small amount of water. Basic survival requires only 2-4.5 L/day, but this is far below the 50-100 L/day that the World Health Organization treats as a basic minimum.[105] In any event, this misses the spirit of the idea that people have a basic entitlement to water security which increasingly ties basic entitlements to broader sets of needs for human wellbeing.[106] If we assume that the positive entitlement is quite a bit larger, then the practical challenges of provision loom large. Responsibility for supplying water when natural and economic resources are limited cannot practically fall on individual states were water insecurity is a persistent challenge. The economic and human cost of building water infrastructure is quite high. Consider the large amount of forced displacement that has happened in China to improve the water distribution and power infrastructure for

Meier et al., *Translating the Human Right to Water and Sanitation Into Public Policy Reform*, 20 SCI. AND ENG'G ETHICS 1, 1–16 (2014); Erik B. Bluemel, *The Implications of Formulating a Human Right to Water*, 31 ECOLOGY L.Q. 957, 957 (2004).

102 *Id.*, *see especially* Winkler, *supra* note 101.

103 *See generally*, Bluemel, *supra* note 90; Brunner et al., *supra* note 91; Peter H. Gleick, *The Human Right to Water*, 1 WATER POL'Y 487, 487–503 (1998).

104 John Scanlon, Angela Cassar & Noémi Nemes, *Water as a Human Right?* 51 (Int'l Union for Conservation and Nature Ser. No. 16) (2004); Bluemel, *supra* note 90; Gleick, *supra* note 86; Vrinda Narain, *Water as a Fundamental Right: A Perspective from India*, 34 VT. L. REV. 917, 917 (2009); Sharmila L. Murthy, *The Human Right (s) to Water and Sanitation: History, Meaning, and the Controversy Over-Privatization*, 31 BERKELEY J. INT'L L. 89, 89 (2013).

105 Peter H. Gleick, *Basic Water Requirements for Human Activities: Meeting Basic Needs*, 21 WATER INT'L 83, 83–92 (1996).

106 *See* Jepson, *et al.*, *supra* note 19.

the general population.[107] Millions of people have been involuntarily relocated to build massive interbasin transfer projects from the wet southern parts of the country to the dry northern ones. The environmental costs of these projects are significant as well, and thought they solve some water security problems in the short term, they do so by causing significant externalities in other areas.

Whether explained in terms of the right to life or not, the idea that humans have a basic right to water is motivated by the idea that it is *individual need* which entitles people to a share of water resources. This is a welfare-based view of these rights—the claim to a portion of the world's water rests on the fact that their individual welfare is damaged when they do not get it. An alternative tactic for establishing a right to water runs through the authority of states to protect citizens' *property rights* to resources they need or *territory* that they occupy. In fact, some classical theories of state authority tend to argue that states gain their legitimacy exactly by protecting people's property claims to resources, or by providing a fair playing field of justice and law necessary to make property rights secure.[108] One reason to justify a right to water this way is that it puts what looks like a contest between rights claims—rights to welfare and rights to territory—in the same terms. Both are explained through the state's authority to protect or deny people's claims. To a very a great degree, people's prospects for welfare are dependent on the stability of institutions that define the nation in which they live, and on contemporary liberal views of state legitimacy, the ability to maintain just institutions that protect basic rights underwrites a state's jurisdictional authority over its borders. Water's naturally uneven distribution, the disregard for water sustainability in the founding of political boundaries, and climatic changes, create a situation in which these rights claims are severely tested.

b. Water Rights, Depletion, and Borders

If water rights are justified by individual needs—i.e. people have rights entitlements to adequate water resources in order to achieve basic welfare—then this suggests either a direct conflict of rights claims or a significant re-ordering of international attitudes about climate migration. It is hard to imagine that a nation's rights to prevent migration across its borders (or to protect the property and territory rights claims these borders signify) could be so strong as to justify turning away literally any amount of suffering people. If the property claims to water internal to the receiving state are themselves based on the welfare benefits that they give to citizens, then this makes the permissibility of denying migration into

---

[107] Jim Yardley, *China - Three Gorges Dam - Impact*, N.Y. TIMES (Nov. 19, 2007), https://www.nytimes.com/2007/11/19/world/asia/19dam.html; Mara Hvistendahl, *China's Three Gorges Dam: An Environmental Catastrophe?* SCI. AM (Mar. 25, 2008), https://www.scientificamerican.com/article/chinas-three-gorges-dam-disaster/.

[108] The former view is generally associated with John Locke, and the latter with Immanuel Kant. JOHN LOCKE, SECOND TREATISE OF GOVERNMENT: AN ESSAY CONCERNING THE TRUE ORIGINAL, EXTENT AND END OF CIVIL GOVERNMENT (1689); Immanuel Kant, THE METAPHYSICS OF MORALS (1886); *See also*, Onora O'Neill, *Justice and Boundaries, in* POLITICAL RESTRUCTURING IN EUROPE 74–93 (2003); Cara Nine, GLOBAL JUSTICE AND TERRITORY (2012); A. John Simmons, *On the Territorial Rights of States*, 35 NOÛS 300, 300–326 (2001); David Miller, *Territorial Rights: Concept and Justification*, 60 POL. STUD. 252, 252–268 (2012).

a matter of identifying the amount of migration that will maximize group welfare. Desire to have a border that defines national interests and a national value for protecting an existing way of life may well factor into the calculation. But in general, if rights to water rest on human welfare, this recommends a significantly weaker border regime than currently dominates the world. People living in a water secure country could not justify preventing the movement of people toward water security if it collectively improves access to those rights, regardless of whether their own individual welfare will decrease some (perhaps substantially) in the process. If climate change is disruptive enough, this account of water rights would result in fairly radical re-ordering of populations, as nations could not justify turning away climate migrants until the welfare conditions of the people living there began to badly deteriorate as a result of the migration. On the most radical versions, it might even recommend annexation of water scarce places by water rich places in an effort to achieve higher levels of water security.

If, instead of individual needs satisfaction, we think about rights to water in terms of property rights claims, then the facts of uneven distribution are still significant. There are two broad legal doctrines that govern water "ownership."[109] The *riparian doctrine* entitles everyone with land adjacent to a water system a proportional amount of the water available in a system on the condition that they return water to the system undiminished in quantity or quality. Traditionally, this doctrine governs wet places where there is more water available than demand. Under the *appropriation doctrine*, users gain entitlements to divert, use, and store quantities of water, usually tied to other property rights such as land titles. This system has a stronger claim on the mantle of a true legal property right than the riparian doctrine and tends to apply to places in which demand is significantly higher than available supply. This simple doctrinal division is belied by a lot of complexity in practice, but for the purposes of this discussion, the important thing to note is that both systems are typically accompanied by reasonable use conditions. In the case of the riparian doctrine, this is a central part of the idea. Since most water uses are consumptive, it is frequently impossible to return water to the common supply undiminished in quantity or quality. As such, riparianism simply advises reasonable use and entitlements that are conditional on sufficient abundance. Appropriation of water resources requires serious justification. It is difficult to see how it could be permissible for someone to sequester water without threatening the common idea that no individual has inherent exclusive claim to the Earth's valuable natural resources. Traditional arguments for exclusive property rights to natural resources tend to follow Locke in arguing that these claims are defensible with the proviso that after appropriation there is still "enough, and as good, left in common for others."[110] There is intense, and justified, disagreement about the philosophical viability of the appropriation theory given that reasonable use conditions like the Lockean Proviso, but in application to water resources, they are generally interpreted to enjoin against making others

[109] Douglass Shaw, WATER RESOURCE ECONOMICS AND POLICY: AN INTRODUCTION (2008); Robert Glennon, *Water Scarcity, Marketing, and Privatization*, 83 TEX. L.R. 1873, 1873-1875 (2014).

[110] *See* Susan P. Liebell, *The Text and Context of "Enough and as Good": John Locke as the Foundation of an Environmental Liberalism*, 43 POLITY 210, 210–241 (2011).

drastically worse off or failing to put captured resources to productive use.[111] If we are inclined to think of water rights claims in terms of property, then it seems likely that the strength of those rights (i.e. the state's authority to protect them) is limited in some way by whether the proviso can be met. Because the planet's water resources are naturally distributed, it seems reasonable to think that resource depletion that is not directly related to poor management is subject to the proviso. If this is correct then the property rights to water which water rich states secure become weaker as there is less water available to people, even if they are beyond the borders of the state. To the extent that the state's authority to enforce its borders is dependent on its role as an enforcer of property rights, displaced people have an opening to claim that they ought to be allowed to use a portion of the resources previously captured by the state. Because water resources are so difficult to transport, populations affected by climate-related water insecurity would have a reasonable claim to be allowed to move toward more secure supplies. This model of water rights also suggests that water migrants ought to have some broader legal claim to migration on the grounds that they are entitled to a fair share of planetary water resources.[112]

A more nationalist territorial view of state authority suggests that people have a strong interest in forming communities that allow self-determination.[113] These include cultural, religious, and ethnic communities that share common bonds of history, social norms, and practices. They are not inherently geographically delimited, but geography could be an element of their identity. The purpose of the state, and the source of its authority, one might argue, come from the need of these groups to protect their continued existence. This theory of state authority permits significantly stronger restrictions on migration because at least part of the purpose of the state is to deflect threats to the groups of "peoples" that occupy its territory. Climate change and water insecurity are geographic threats and displacement may simply destroy a people that has an identity which is strongly geographically determined. Take, for example, island peoples whose identity is linked deeply to their island nation. They are self-determining in their desire to farm, eat, and construct homes in ways that are only possible given the particular ecosystem of the island. If the island is overtaken by climate change-linked sea level rise and they must move, they disappear as a people. In most cases, identity is less place-based and migration will not destroy the group. In such cases, the state as a responsibility to permit and facilitate internal migration and to prevent it from reducing the ability of other peoples within the state to live in self-determining ways. Neighboring states, however, might argue that they have significantly less responsibility to accept climate migrants because they have no

[111] *See generally* Jim Yardly *Supra* note 107; Mara Hvistendahl *Supra* note 107; John Locke *supra* note 108; Immanuel Kant *supra* note 108; Cara Nine *supra* note 108; A. John Simmons *supra* note 108; David Miller *supra* note 108; Douglass Shaw *supra* note 109.

[112] Mathias Risse, *The Human Right to Water and Common Ownership of the Earth*, 22 J. POL. PHIL. 178, 178–203 (2014); Tim Hayward, *Global Justice and the Distribution of Natural Resources*, 54 POL. STUD. 349, 349–369 (2006); Nine, *supra* note 108; Michael Blake & Mathias Risse, *Immigration and Original Ownership of the Earth*, 23 NOTRE DAME J.L. ETHICS & PUB. POL'Y 133, 136-137 (2009).

[113] *See* Miller, *supra* note 108.

responsibility to preserve the integrity of peoples from other nations. On the other hand, they may well be willing to absorb those groups if doing so will not disrupt their responsibilities to other peoples. Presumably their ability to do this will be heavily dependent on resource availability.

c. Responsibility for Water Migrants

There are, unquestionably, more ways to think of water rights than as welfare needs, property claims, or part of group identity. However, each of these views suggests state should be inclined to facilitate migration unless it will be very damaging to the receiving nation or sub-national region. The relevant conception of water rights nevertheless has a significant impact on the extent of the obligation to receive migrants and the reasons that a nation might prevent migration. Running through each of these views of water rights, one can feel a broader question looming about the extent of responsibility nations have for opening borders to water migrants when they are not themselves clearly responsible for the displaced population's water insecurity. Responsibility for remedying the harms caused by climate change is likely to become a more robust area of international legal study in the future. Global attitudes about the causes of climate change have shifted significantly over the last few decades toward the belief that humans are extensively responsible for its consequences, and that this responsibility is not evenly spread across the population. If attempts to slow these consequences are not robust enough, there will likely be a serious push to assign legal responsibility in increasingly formal ways.

I have referred repeatedly to water's naturally uneven distribution across the planet. There is reason to think that this, coupled with the fact that people are not responsible for the conditions of their birth, means that any resulting personal disadvantage from natural water insecurity is unjust. The next question is who has a responsibility to remedy this injustice? The nation in which the water insecure person lives surely holds some responsibility for remedy, but not because of the fact of natural scarcity. Nations may be responsible, on any of the conceptions of water rights above, for not further limiting citizens' access to water resources. But beyond this, their capacity to improve conditions may be quite limited. The construction of new water infrastructure, interbasin transfers, or the wholesale relocation of people is very costly, both financially and socially. The depth of the need for improved water security makes it attractive to look for views of responsibility which fall on a much broader scope of actors.

If the negative consequences of water insecurity were directly caused by those of us in water rich places, or if those of us in water rich places were made better off by water insecurity elsewhere, there may be grounds for compensatory duties. That is, if the behavior of members of nation A causes water insecurity in nation B, B may be owed compensation for the consequences of that insecurity. For example, in river systems which run through multiple nations, it is possible that upstream groups have a responsibility to refrain from or repair harm caused to downstream populations for depleted or polluted water. Causal responsibility for

downstream water insecurity, *ceteris paribus*, creates a duty to compensate downstream riparians which might reasonably include accepting migrants.

Some authors have suggested that water rich places have a responsibility to compensate water poor places simply in virtue of their differential native access to the resource.[114] This seems incorrect. Unlike carbon emissions, global water consumption creates a much more attenuated relationship to water depletion in distant places. The industrialized nations that contribute the overwhelming majority of greenhouse gas emissions have a disproportionate responsibility for the effects of climate change globally and so a larger responsibly for the negative consequences on the global environment, some subset of which are water related.[115] But water consumption habits in water rich places, such as the Great Lakes region of the United States, do not directly impact the water security conditions of people in far-away naturally dry places like Egypt. The "water footprint" of products that I consume is sometimes cited as evidence that this reasoning is not correct.[116] The thought is that the water necessary to produce products (called "virtual water") in dry places is lost to the water scarce place which might have used it in some other way. There are a few reasons, however, for thinking that this virtual water trade does not automatically constitute a harm that ought to be specially compensated. For one thing, the loss of water to production and trade that dry places face is not theft. It is part of a productive economic process that often improves the lives of the people doing the producing. Secondly, the wet places in the world are still the largest exporters of virtual water. Exports of water intensive products from water stressed places do exist, but typically these places are net importers of water from wetter nations.[117] Water pollution caused by manufacturing, however, is absolutely a form of exported water stress. When we purchase products—especially electronics and textiles—from places where pollution standards are low, we contribute to a system of production that directly reduces available water supplies in the producing nation. In sum then, the nations contributing disproportionately to climate change have a greater responsibility to remedy its negative consequences on water security—through aid, compensation, and accepting migrants—but they do not generally have a responsibility to reduce their own consumption as a remedy. In fact, they may have a responsibly to *increase* consumption through exporting virtual water in products to dryer places. Whether places that are naturally dry have an entitlement claim to a portion of the world's resources independent of any facts about climate change or global consumption patterns remains unclear.

---

[114] Risse, *supra* note 108.

[115] Union of Concerned Scientists, *Each Country's Share of CO2 Emissions*, (Oct. 11. 2018), https://www.ucsusa.org/global-warming/science-and-impacts/science/each-countrys-share-of-co2.html.

[116] Arjen Y. Hoekstra & Mesfin M. Mekonnen, *The Water Footprint of Humanity*, 109 PROC. NAT'L. ACAD. SCI. 3232, 3232–3237 (2012); ARJEN Y. HOEKSTRA, THE WATER FOOTPRINT OF MODERN CONSUMER SOCIETY (2013).

[117] *Id.*

IV. Responses to Global Water Migration

As with climate change, our individual contributions to global water insecurity are very small. We may have good reason to change our individual behavior to help reduce collective stress on the environment, but the most effective mechanism for both mitigating climate change and responding to it remains national governments and international institutions. The wealthy nations contributing the most greenhouse gasses, even when they are distant from water insecure nations, can take responsibility by drastically and immediately reducing their emissions, targeting aid to climate resilience and adaptation for vulnerable populations, and accepting water refugees if they are themselves water secure.[118] This has somewhat different consequences for the world's two largest emitters—China and the United States—because China faces much higher rates of internal water stress then the US.[119] This may ultimately excuse it from accepting large numbers of climate refugees, but not from compensating those harmed by climate change in other ways. Because the costs of accepting these responsibilities are potentially very high, it is tempting to look for ways to distinguish between water insecurity caused by poor governance, climate change, and natural scarcity. However, these elements of water insecurity are deeply intertwined. We cannot meaningfully distinguish between water migration resulting from physical scarcity, failures of governance, or climate change, and so must treat them as all of a piece for the purposes of policy.

It is clear, however, that there ought to be much greater influence on preventing migration. While it can be a successful adaptation strategy, it is evident that it is one of last resort, pursued only when everything else has failed.[120] There is a huge need to organize international preparation for sudden-onset disasters which includes extended support for populations that may not be able to return home for some time. More effort can be made to build shared predictive models for both disasters and population vulnerability that could inform relief and preparation efforts. The reality is that water insecurity assessments can be done with existing datasets in way that provides a fairly clear picture of migration and medium-term water risk.[121] Working the expectation of migration and worsening water security into relief and resilience planning is essential.

---

118 Kanta Kumari Rigaud et al., WORLD BANK, GROUNDSWELL: PREPARING FOR INTERNAL CLIMATE MIGRATION (2018).

119 Ximing Cai, *Water Stress, Water Transfer and Social Equity in Northern China—Implications for Policy Reforms*, 87 J. ENVTL. MGMT. 14, 14–25 (2008); Scott Moore, *Hydropolitics and Inter-Jurisdictional Relationships in China: The Pursuit of Localized Preferences in a Centralized System*, 219 CHINA Q. 760, 760–780 (2014); Jiao Wang, Lijin Zhong & Charles Iceland, *China's Water Stress Is on the Rise*, WORLD RESOURCES INSTITUTE (Jan. 10, 2017), https://www.wri.org/blog/2017/01/chinas-water-stress-rise.

120 Hagmann, *supra* note 42; Hartman, *supra* note 18.

121 *See, e.g.*, U.N. Food and Agriculture Organization's AQUASTAT system, http://www.fao.org/nr/water/aquastat/main/index.stm; World Resource Institute's ongoing Aqueduct mapping project, https://www.wri.org/our-work/project/aqueduct; *See also* Emerging Research on Household Level Water Insecurity from the Household Water Insecurity Experiences (HWISE) Scale, https://sites.northwestern.edu/hwise/.

There is also room to create new international legal frameworks. Julia Toscano proposes the category of environmentally-displaced persons (EDPs) to standardize terminology and classification, possibly to create new or supplemental human rights obligations. She argues that a separate climate migration agreement is necessary, operating independently of the UNHCR, with its own oversight and capacity agency to assist and relocate EDPs.[122] Creating a parallel organization to specifically address EDPs avoids the disagreements about refugee status discussed above, and also allows the agency to focus on internal displacement, which dominates displacement in absolute terms. Given the physical conditions which precipitate water migration, it is considerably easier to identify and plan for emerging migration patterns, and this recommends a dedicated and centralized institution.[123]

It may also be possible to generate new protocols dedicated to water migration under the UN Framework Convention on Climate Change (UNFCCC), the international cornerstone of climate change law.[124] Working within the established UNFCCC framework would create a more integrated approach toward international adaptation policy aimed at maximizing the productivity of existing bodies, rather than creating new ones. Though the UNFCCC currently frames relations between states rather than state obligations to individuals, it could incorporate "assistance obligations" into its existing mandates to maintain common but differentiated responsibility and reduce global emissions. Others have envisioned frameworks for an expanded UNFCCC system with a multilateral migration assistance fund sponsored by industrialized countries to support climate adaptation and relief in countries managing large numbers of environmental migrants. Biermann and Boas propose one such framework, the UNFCCC Protocol on Recognition, Protection, and Resettlement of Climate Refugees.[125] Under the UNFCCC framework, the protocol would create an executive committee under the Conference of the Parties to the UN Climate Convention, operating within its established structure. The protocol process would parallel previous UNFCCC efforts such as the Montreal Protocol on Substances that Deplete the Ozone Layer.

Any set of international legal efforts will need to be supported by much more robust mechanisms at the individual state and watershed levels. Carey DeGenaro, citing the "political challenges and long lag-time" of an international convention, argues for updating national level refugee laws to handle an expanding class of climate migrants. In the US, DeGenaro offers, this might include expanding the definition of a stateless person to explicitly include environmental migrants, al-

---

[122] Toscano, *supra* note 12; *see also* Bonnie Docherty & Tyler Giannini, *Confronting a Rising Tide: A Proposal for a Convention on Climate Change Refugees*, 33 HARV. ENVTL. L. REV. 349, 359-361 (2009).

[123] Toscano, *supra* note 12, at 620; Biermann & Boas, *supra* note 34; *See also* Docherty & Giannini, *supra* note 74; Carey DeGenaro, *Looking Inward: Domestic Policy for Climate Change Refugees in the United States and Beyond,* 86 U. COLO. L. REV. 991, 991-1047 (2015).

[124] *See generally* Rina Kuusipalo, *Exiled By Emissions—Climate Change Related Displacement and Migration in International Law: Gaps in Global Governance and the Role of the UN Climate Convention*, 18 VT. J. ENVTL. L. 615, 634-646 (2017).

[125] Biermann & Boas, *supra* note 34.

lowing migrants to apply tor permanent legal status.[126] Other states should perform similar domestic legal updates. At least some of these ought to be done in concert with other nations that share the same watershed. "Transboundary management" at the basin level has long been a soft recommendation in the water conflict literature. Discrete agreements to change domestic immigration laws between riparian nations for the purpose of absorbing and directing resources toward water migrants puts real substance into this recommendation.

VI. Conclusion

Water insecurity is already a serious and worsening global challenge. There is strong indication that climate change will deepen water insecurity and result in larger numbers of displaced people migrating to find more stable water resources. The traditional linear story which originates in scarcity and ends in migration is, however, vastly oversimplified. Water insecurity and any resulting water migration is irreducibly tied to the social, economic, and political conditions which surround natural and climate-induced scarcity. Rejecting the linear account of migration, however, does not prevent us from identifying important patterns and factors that contribute to water migration patterns. Rapid physical changes in supply and weak governance stand out as factors that precipitate migration.

Understanding state obligations toward water migrants depends, I have argued, on an understanding of why we think people have a right to water, as well as the ways in which hydro-social factors influence their ability to satisfy this right. The regimes governing water migration at the international level are deeply inadequate for handling this emerging class of rights conflicts. We are not without options for expanding and adjusting existing international mechanisms to handle water migrants. But the scale of the problem and slow movement at the international level indicates that water migration across and within nations will require rethinking both domestic and international laws. The pace of climate-induced migration will, sadly, not slow for us to work out responses fully before enacting them.

[126] DeGenaro, *supra* note 123.