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POLICY ARENA

DEBATING ENVIRONMENTAL MIGRATION: SOCIETY, NATURE AND POPULATION DISPLACEMENT IN CLIMATE CHANGE

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Abstract: This article approaches the problem of environment and migration through a consideration of convergent themes regarding nature and society in ecological theory and in social scientific disaster research. The paper argues that the articulation between ecological and social theory provides grounding concepts for both framing the issue and research on the problem of actual and potential mass displacement of human populations by environmental change, specifically global climate change. This article asserts that effective policy responses to environmental displacement and migration cannot be developed without an in-depth understanding of the phenomena of climate change, human-environment relations, and migration and the linkages among them. Copyright © 2012 John Wiley & Sons, Ltd.

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1 INTRODUCTION

Today, it is an increasingly accepted scientific tenet that nature and society, because of human activities, are no longer seen as separate interacting entities but rather as mutually constituting components of a single system, often referred to as socio-ecological systems (Young *et al*., 2006). Nevertheless, although implicit in many of the discussions about climate change effects, this tenet is generally not referred to explicitly in the analyses, and nature and society are treated essentially as a duality in interaction. This seems particularly true of the debates surrounding the issue of environmental migration, including those regarding climate change. Indeed, despite the fact that the reality of climate

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change is generally accepted, the impacts of actual and projected effects are still much debated in both scientific and political forums. There is considerable uncertainty about local manifestations of global climate change and what necessary adjustments will be induced in natural and human systems (Dessai *et al*., 2007: 1). The uncertainty, in fact, characterises the problem both at the level of physical impacts and at the level of responses and adjustments in human communities. Indeed, the projected effects of climate change, particularly as they pertain to specific human communities, have entered as much into political controversy as they have into academic and scientific debate.

My intention in this paper is to analyse the substance of the debate surrounding the issue of environmental migration in the context of climate change. The second section of the paper briefly summarises the current trends in environmental conditions and their potential for the displacement and forced migration of human populations. Additionally, it considers the array of serious questions on environmental migration that must be confronted. In the third section of the paper, I assess briefly the nature of the challenge in formulating adequate policy responses to environmentally driven displacement and forced migration. The fourth section addresses the basic issues of the debates surrounding the issue of environmental migration. In the fifth section, the role that the nature-society nexus can play in clarifying the issues of the environmental migration debate is discussed, particularly in the context of the politics of environmental displacement, which is the subject of the sixth section.

2 TRENDS OF ENVIRONMENTAL CHANGE AND THE POTENTIAL FOR HUMAN DISPLACEMENT

Data from the Emergency Events Database at the Centre for Research on the Epidemiology of Disasters (CRED, 2008) demonstrate that a continuous increase in the frequency of many natural and anthropogenic hazards has been taking place over the last few decades, although a levelling out has been seen thus far in the 21st century. However, floods, droughts, storm surges and other natural and technological agents are impacting greater numbers of people and increasing damages globally, although fatalities are reported on the decline (CRED, 2008). Among the factors that explain these trends, are improved recording of disasters and their impacts, increased exposure of population to hazards (through demographic increase or greater settlement in high risk areas), or because of environmental degradation processes including climate change (Warner *et al*., 2010).

Moreover, the Millennium Ecosystem Assessment (MA, 2005a) concluded that 15 of 24 assessed ecosystem services were being degraded or used unsustainably, with serious effects for poor, resource-dependent communities. Among the issues the Millennium Ecosystem Assessment calls attention to is the fact that 10 to 20 per cent of drylands are already degraded affecting as many as two billion people. Increasing pressure on dry land ecosystems will affect the provision of ecosystem services such as food, and water for humans, livestock, irrigation and sanitation. There will as well be likely increases in water scarcity because of climate change in highly populated regions that are already under water stress. Droughts are also increasing in frequency, and their continuous reoccurrence can overwhelm community coping capacities. When coping capacities and adaptation strategies of communities are overcome by the loss of ecosystem services, droughts and loss of land productivity can act as triggers for the movement of people from dry lands to other areas (MA, 2005b; Renaud and Bogardi, 2007; Warner *et al*., 2010).

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Nonetheless, questions abound regarding the relationship between climate change and migration. At present, we have only just begun to frame the basic questions about who has been displaced by global environmental change and why. Will adaptations be possible that will allow people to maintain stable communities in place? How costly both in economic and in socio-cultural terms will these adaptations be? Will there be mass displacements and migrations? Will these displacements and migrations be truly environmentally driven, or will they be caused by economic or political factors simply exacerbated by climate change? Will the affected populations be internally displaced, or will they migrate internationally? If these mass displacements occur, will they take place, as the result of sudden onset disasters, produced by natural forces made more intense by climate change, or will they be the result of gradual increases that slowly make habitats uninhabitable? Will these migrations be the outcome of decisions made by individuals and families, or will entire communities be displaced and resettle as communities? Will these displacements be voluntary or involuntary? Will people be displaced and resettled in some organised fashion, or will it be left up to individual decision making? Will any measures taken be effective in responding to the needs of displaced populations?

The answers to all these questions today are at best conjectural. Given the sketchy and uneven quality and quantity of data on environmental migration at the moment, all but the most general projections are highly provisional. And, to paraphrase Holling (1994), where climate change is concerned, we can expect surprises. However, it is clear that to develop adequate responses to these questions regarding the social impacts of climate change, we must begin by addressing them at the multiple levels at which they exist, and particularly in the complex interrelationships between nature and society both conceptually and specifically as expressed in local contexts (Oliver-Smith, 2009). Such a perspective has been noticeably lacking in the debates of the issue of environmental migration, which have tended, until quite recently (Black *et al*., 2011), to focus primarily on environmental drivers (Myers, 1997) or conversely the political and economic causes of migration (Black, 2001).

3 ENVIRONMENTAL CHANGE, SOCIAL VULNERABILITY AND FORCED MIGRATION

Research on social vulnerability has made clear that exposure to hazards alone does not determine where the serious effects of any hazard will most likely be experienced (Wisner *et al*., 2004). What can we expect from future increasing effects of climate change for specific regions and communities? To answer that question is difficult because of the numerous variables and the non-linearity of their interactions. The challenge lies in determining not just absolute exposure and absolute exposed population but specific lands and populations in different socially configured conditions of resilience or vulnerability. In fact, conditions of vulnerability are accentuating rapidly due to increasing human-induced pressures on ecosystems. Moreover, the vulnerability of a nation to climate change effects is partially a function of its level of development and per capita income (Nicholls *et al*., 2007: 331). The lesser developed countries have a significantly higher level of vulnerability to climate change effects.

However, the problem with assessing the exposure of both lands and people to climate change is that not only are we dealing with projected climate change effects but also with various future projections about various physical, societal and infrastructural trajectories including greenhouse gas emissions, demographic change, migration trends, infrastructural

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development, mitigation strategies, adaptive capacities, vulnerabilities and patterns of economic change, all of which will play out in different ways, according to the political, economic and socio-cultural dispositions of national governments, international organisations and general populations (Nakicenovic and Swart, 2000).

These difficulties in establishing both exposure and vulnerability in specific localities and populations, notwithstanding, climate change and its impacts have serious human rights implications, but they are subsequent to the human rights violations that pre-exist climate change (Adger *et al*., 2006). The problems of Andean agro-pastoralist peasant farmers or the slum dwellers of Mumbai do not start with climate change, but climate change will make their problems worse by any measure, resulting in many cases in likely displacement and migration.

4 DEBATING THE ENVIRONMENTAL MIGRANT QUESTION

The contingent nature of prediction of environmental impacts, the vast disparities in predictions of numbers of people to be affected, the elusive nature of definitional issues, the difficult question of causation and the overall complexity of human-environment relations, all present serious challenges to researchers attempting to analyse the relationship between environment and migration. Compounding the complexity of socio-ecological systems and the often intertwined causal factors of migration, the failure to reach a consensus definition of environmental migration has further impaired efforts to diminish the uncertainty that surrounds the issue (Gemenne, 2011). Without the parameters of an established definition, it is difficult to state whether migrating populations are actually environmental migrants or, for example, economic migrants. One of the complications of the lack of a consensus definition is the enormous disparity in estimates of people who have been or will be displaced by the effects of environmental change, ranging from 50 million (El-Hinnawi, 1985) to 250 million (Christian Aid, 2007). Estimates are at least in part contingent on how environmental migration is defined and who will fall under a given definition.

There is also considerable debate about what exactly constitutes an environmentally induced move and how to measure and explain it (Adamo, 2008: 2). The actual processes through which major population dislocations might occur are still only partially understood. Since the 1980s, researchers have linked the issue of environmental change with human migration, explicitly designating as 'environmental refugees' people who are forced to leave their homes, temporarily or permanently, because of the threat, impact or effects of a hazard or environmental change (El-Hinnawi, 1985). In 2009, the Global Humanitarian Forum (2009) predicted that over 20 million people would be displaced by environmental causes in that year alone. The UNHCR sees five displacement scenarios emerging in the near future: hydro-meteorological disasters, population removal from high risk areas, environmental degradation, the submergence of small island states, and violent conflict (2009: 4).

Objections to these contentions are derived from basically three perspectives: theoretical, legal and political. Some scholars assert that it is erroneous to attribute causality to the environment because migration is always the result of multiple factors, including social, economic and political as well as environmental forces, underscoring the fact that human demographic movement is both a social and an ecological phenomenon, both impacted by and impacting the environment (Kibraeb, 1997; Black, 2001; Castles, 2002).

The legal objections question the term 'environmental refugee' in two ways. The 1951 United Nations Convention Relating to the Status of Refugees legally defined a 'refugee'

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as a person who flees their country of nationality for fear of persecution based on race, religion, nationality, ethnic or social group or political opinion. People displaced by environmental causes do not qualify under the UN convention definition of 'refugee'. Moreover, critics also fear that applying the term 'refugee' to environmentally displaced people will mask the political causes of displacement and allow states to evade their obligation to provide asylum (Kibraeb, 1997).

Other scholars object to the term politically because of instances when the term 'refugee' has nourished xenophobic and racist perspectives, pointing to the fear of climate-induced migration that has recently entered European and North American political discourse. They are disturbed by press predictions of waves of desperate climate migrants flooding into Europe or over the southern US borders and the manipulation and fear mongering by politicians intent on stirring up nativist and anti-immigrant feelings among local populations. 'Words matter, and terms such as "environmental refugee" and "climate migrant" have been used in contexts that could accidentally give fuel to xenophobia and racism' (Wisner, 2009).

Hartmann (2009), criticising principally the literature on environmental change and conflict, objects to the term 'environmental refugee', asserting that the term naturalises or depoliticizes the economic and political causes and masks the role of institutional responses to it. She further claims that the term 'environmental refugee' is dehistoricizing, eliding the causes of why particular populations are more vulnerable. In other words, the term puts the blame on nature rather than on the social causes.

Although the substance of all these assertions, both pro and con, on environmental migration may be questioned, the concerns they express are valid and reflect the difficulties of developing appropriate political, policy and practical responses for environmentally displaced peoples in the near future. The relationship between environment and migration is far from linear or straightforward, and understanding it presents a number of conceptual challenges. These challenges are embedded in the complexity of the relationship between social and ecological systems and in the nature of causality between such complex phenomena. It is also clear that the 'environmental refugee' controversy is both highly charged and deeply embedded in the way complex human-environment relations are understood by scholars, politicians and the general public.

Interestingly, the debate over environmental displacement is rarely framed in terms of society-nature relations. Generally speaking, society-nature relations in this literature have been relatively unproblematized, and the discussions have been limited to fairly linear understandings about the causality of environmental factors in migration. Environmental scientists generally tend to see people uprooted by environmental factors (e.g. El-Hinnawi, 1985; Jacobson, 1988; Myers, 1997). Migration specialists, on the other hand, attribute uprooting to a multiplicity of social factors (economics, politics, governance, etc) (e.g. Black, 2001; Castles, 2002). At the core of this dispute, there is an unspoken Cartesian duality between nature and society which must be addressed if the issue of environmentally displaced peoples is to be fully grasped.

5 THE 'NATURE' OF SOCIO-ECOLOGICAL SYSTEMS

Given the amount of attention devoted to the nature-society nexus over the last 20 years, it is somewhat surprising that the issue has not played a more prominent role in assessing environmental migration. In this section of the paper, I would like to outline somewhat schematically, some of the relevant features in contemporary discourse on the nature-

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society nexus that help to adequately frame the complex realities of environmental migration. My intention is not so much to add to this now quite voluminous discourse as much as to insist on and demonstrate its utility for understanding environmental displacement and migration.

The relationship between society and nature is one of the fundamental, if often, unexamined, pillars of any ideological system. Since the enlightenment in the 17th and 18th centuries, the dominant western constructions of the relationship between human beings and nature place them in opposition to each other (Redmond, 1999: 21). Certainly, the bedrock contention of the modern world view, first articulated specifically in Descartes's Meditations, conceived of nature as 'other', detached and external to humans and the world of thought, thus reifying nature as a thing, in a sense, devoid of meaning in itself (Harvey, 1996: 134). Scientific and philosophical discourses of the time saw humans as ontologically distinct from nature. Indeed, nature provided a contrasting category against which human identity could be defined as cultural rather than natural in the work of Hobbes, Locke and Rousseau. Since the enlightenment, assertions regarding the causal relations between nature and society in various forms of determinism have been espoused and eventually discarded, but the fundamental duality persisted.

Although still struggling with the Cartesian legacy, more contemporary research on the relationship between nature and society has focused on overcoming the binarisms that characterised that era. Understanding environmental change and its effects, such as population displacement, requires reframing nature-society relations from a duality to a mutuality, essentially positing that nature and society are inseparable, interpenetrating, each implicated in the life of the other, each contributing to the resilience and vulnerability of the other (Whatmore, 2002; Castree, 2003; Oliver-Smith, 2003). That is, in this understanding, people are not just vulnerable to environmental changes but also environmental changes are increasingly the result of human activity, not just technologically but in terms of human alteration or construction of the environment. In a sense, the question of how well a society is adapted to its environment must now be linked to the question of how well an environment fares around a society. The issue of mutuality is now at the forefront. Environmental migration clearly expresses that mutuality.

Causal relations between society and nature have been long debated with various forms of determinisms espoused and eventually discarded. Nature and society are now seen component elements interacting in a single complex system now essentially referred to as a socio-ecological system. Although not hierarchically positioned in ontological terms, it is not possible to understand the operation of one component without taking into account the operation of the other (Castree, 2003). Each component in this system operates in relationship with the other, although each also has its own autonomous processes that are capable of acting independently of the other. However, some have suggested that human action now dominates and that we are living in a new geological epoch referred to as the anthropocene (Vitousek *et al*., 1997; Crutzen and Stoermer, 2000). Climate change driven by excess production of greenhouse gases would appear to support that assertion.

For all intents and purposes, natural processes are now in interaction with social processes in the production of global and specific vulnerability, environments and problems. The recognition of the human influence on global climate patterns now confirms that human action both purposefully and inadvertently shapes natural systems into human constructed environments. Human action notwithstanding, however, we still have to contend with forces within nature, albeit inflected profoundly by human processes, that clearly transcend any

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social efforts to transform or control. Principle among these, at least for our purposes, are natural hazards: earthquakes, hurricanes, tornadoes, droughts, floods, forest fires and others as well as the disaster provoking effects of climate change. It is in these forces that nature, or natural processes, maintain their 'consequential materiality' in Castree's (2003) terms. However, the materiality of a nature that has been profoundly socialised challenges an adequate theorization of the relationship between environment and migration. Indeed, the materialities of nature and society condition each other in changing and historically contingent ways.

In effect, the behaviour of socio-ecological systems cannot be understood unless both sides are treated as endogenous (Kotchen and Young, 2007: 150), which is further complicated by the fact that neither is a pure form unto itself (Latour, 1993: 77–78; Whatmore, 2002:3). The endogeneity of both sides is the challenge. Both society and nature are highly interactive, incorporating dimensions of the other in their own processes. Social features now infuse what have previously been purely natural processes and by the same token, natural processes have always been part of society. For this type of analysis, the barrier between human activity and eco-systemic activity must be collapsed, transforming a relation of difference into a relation of mutuality of the natural and social worlds. Therefore, environmental features and ecological processes, such as earthquakes, hurricanes, floods and soil erosion, must be recognised as features of social life; and social and cultural elements, such as racism, religion and politics or commodities, land markets and currency circulation must be seen as functioning ecologically (Harvey, 1996: 392). Although this transposition would not seem deeply problematical, although not without methodological challenges, the failure to engage this process lies at the heart of much of the environmental migration debate.

A lack of conceptual clarity and precision for many terms employed in the discussion of the problem of environment and migration may also be at the root of some of the misunderstandings. If we are to adequately address the endogeneity in socio-ecological systems, we need to develop a language that we can describe it in. Despite an inherited language of difference, both social and natural sciences need to develop concepts and approaches that reflect the interactions between society and the agency of nature (Dickens, 2001: 94).

For example, today in the 'environmental' subfields of the social sciences, the concepts of nature and environment, often colloquially used as synonymous, have become quite distinct. Now, we speak of nature as biologically constructed, referring to those biological, chemical and geophysical features and processes that compose the substance and functioning of terrestrial systems. Raymond Murphy, drawing on Latour (1993), refers to these features and processes as 'primal nature', that is, 'trees, photosynthesis, bacteria, viruses, earthquakes, hurricanes. . .' (2001: 326). Murphy further discusses a state he calls 'pristine' nature, which applies to regions unaffected by human action (2001: 326).

Environment, on the other hand, is socially constructed. It is the outcome of the interaction of natural features and processes with social features and processes. Human environments are not naturally created but socially constructed. Environments consist of the instantiation of social processes in nature, thereby converting the natural into a social product (Harvey, 1996). There are natural features and processes at work in environments, but they are expressed and channelled socially, either as resources, recognised or unrecognised, or threats, recognised or unrecognised. In effect, nature's dynamics are infused in social processes and are thus used by humans for their purposes.

Clearly, however, at the same time natural features and processes continue to operate with effects that are far from entirely controlled by the social (Oliver-Smith, 2003). Even,

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and especially, technology, in Murphy's terms, the blending of socially constructed elements and features and forces of nature (natural materials and the laws of chemistry, physics, biology, etc) for socially defined purposes, is far from totally controlled, often with catastrophic effects (Perrow, 1999), as we have recently seen in the Fukushima calamity in Japan. In effect, social and material practices in combination with natural processes frequently evolve into novel conditions that we must cope with and adapt to.

Therefore, as I have gone to some lengths to point out, we are not talking about nature in some essential or pristine state, but rather an array of human derived and driven processes that construct the global environment. Some might claim that the distinction between nature and environment is too subtle or merely rhetorical, but if we are to advance our analyses with any precision, the terms we use must be specific and not subject to conflation one with another. Indeed, in issues of such importance, as Wisner says, words matter. Particularly in climate change, people will not be displaced by nature but by a set of processes created and driven by human agency, specifically massive production of green house gases that have entrained a series of processes that are transforming global climate and therefore nature. The fact that these processes manifest themselves in and as events that transpire in the environments that we live in or in ways that take the form of natural processes (wind, rain, drought, erosion, etc) obscures their partial human origins. Under no circumstances should they be interpreted as natural. They are most certainly environmental processes that combine human and natural forces and features.

6 THE POLITICS OF ENVIRONMENTAL DISPLACEMENT

Given the increasing urgency in global climate change predictions and the expansion of hazards and disasters that threaten to generate population displacement, the debate on environmental migration has not only sharpened, but has acquired both scientific and political overtones that must be addressed. However, there are a wide variety of factors at work both prior to and after onset that drive and entrain subsequent migration that must also be factored into any analysis. For example, although the South Asian tsunami itself temporarily uprooted hundreds of thousands, the actual permanent displacement and resettlement were carried out by governments responding to multiple agendas (Fernando *et al*., 2010).

It is also important to remember here that the analysis of environmental crises, including disasters, is also no longer restricted to event aspects only but embraces both the processes that set them in motion and the post-event processes of adaptation and adjustment in recovery and reconstruction. Forced migration can be part of the process prior to the event or after, but it is not inevitable. As noted, environmental crises are not caused by a single agent but by the complex interaction of natural and social features and forces that produce an environmental event or outcome.

By the same token, outcomes are rarely the result of a single agent (i.e. a hurricane), but are brought about by multiple complex and intersecting forces acting together in a specific social context that is complex in its own right. Forced migration associated with disasters or other environmental crises, therefore, is commonly the result of the interactions that both bring about the event and are then accentuated by the event itself. Seeking single causes for complex outcomes is usually difficult in any context, and particularly so with forced migration.

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Therefore, Black's critique that focusing solely on 'environmental' factors as causes of migration often obscures the role of political and economic factors is well-taken and echoes the position held by most disaster researchers today that analysing only agents reveals little of the complexity of the political or economic forces that together with agents produce disasters or, for that matter, any forced migration that might ensue. In the face of such complexity then, the question thus becomes how causality is to be reckoned. Hilhorst (2004) contends that the fact that disasters involve the interaction of multiple adaptive subsystems within social and natural systems renders them acutely unpredictable in their development and outcome, if not entirely so in their occurrence. We now understand that most environmental changes, particularly those generated by climate change, are similar.

In addition, apart from their quite reasonable distrust of the disparate estimates of people facing displacement (Gemenne, 2011), the objections of Black and other scholars to the term 'environmental refugee' are derived from three problematic issues. The first is the implicit construction of human-nature relations as a duality, in which each domain is separate and capable of causing things to happen in the other. The change of focus in society-nature relations from a relation of difference to a relation of mutuality implicates human thought and action in the construction of environmental change. The endogeneity that is characteristic of socio-ecological systems complicates seeking single agent direct causality in the environment because it tends to elide the fact that environmental resources as well as hazards are always channelled for people through social, economic and political factors. Thus, it is difficult to point to the environment, even in natural agent disasters, as the single cause of anything. Seeking single agent causality to such complex phenomena would seem a doomed effort in any context. By the same token, eliminating environment factors as the single cause of forced migration hardly warrants discounting them as part of a multiplicity of forces, or in some cases the triggering cause, that combine to generate forced migration.

The second problem area is a conflation of the terms nature and environment. At the core of the objections to the terms 'environmental refugee' or 'environmental migrant' is the notion that these terms allow human action to escape culpability or responsibility for population displacement. It is asserted that the idea of environmentally driven migration tends to suggest that nature is at fault, when in fact humans are deeply implicated in the environmental changes that make life impossible in certain circumstances. The term 'environmental migration' is seen to deflect responsibility toward nature for complex human events such as violent conflict, migration or famine, constituting a form of environmental determinism. Indeed, placing the blame on nature allows governments and development agencies an easy out if they can explain such disasters as hunger and conflict on over-population or environmental change (Wisner, 2009). This critique of the term would be entirely valid if the term 'environment' referred to nature, rather than to a human constructed context in which human processes and natural processes interact dynamically to produce specific kinds of outcomes. A rigorous approach to the social construction of nature's features and processes for human purposes gives full recognition to the socio-ecological complexity that drives environmental displacement and migration.

The third issue, fundamentally a legal one, is that the term refugee has a formal, convention-based definition referring to people who are uprooted and flee beyond their national borders because of a 'well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion'. Environmentally displaced people cannot lay claim to such direct persecution, although systematic habitat destruction and deprivation may be derived from intentional human action. At present, there are no legally binding internationally recognised instruments that address the needs of people

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displaced by environmental causes, prompting a number of proposals for appropriate forms of governance to assist them (Koivurova, 2007; Biermann and Boas, 2010). These proposals argue against including environmentally displaced peoples under the 1951 Geneva Convention Relating to the Status of Refugees. Instead, they propose new legal instruments designed specifically to address the needs of environmentally displaced peoples.

The objections to the linkages being made between environment and migration of Wisner, Hartmann, Kibraeb and others are fundamentally political and concern the political economic and social structural drivers of displacement and migration that are elided by the term 'environmental refugee'. However, approaching environmentally displaced people from a political ecological perspective rules out a depoliticized, dehistoricized analysis. Indeed, since the 1990s, if not before, the general acceptance and use of the vulnerability/risk approach in the analysis of disasters precludes such limited analyses. That the risk/vulnerability approach has not been universally adopted in the general media or political discourse constitutes a serious lag in our transfer of knowledge.

Hartmann's concern with how the displacement of people will be interpreted and represented merits recognition. The dangers in the potential misuse of issues of environment and migration are unquestionable, but those dangers are present in most research on social and environmental issues. Climate change (or environmental change) and migration is an incredibly complex issue, but it is happening. And human displacement is one of its potential effects. Research on environment and migration is politically volatile, and certainly vulnerable to misuse and misrepresentation, but despite that, it must be taken absolutely seriously because the potential outcomes are serious.

As Wisner, Hartmann and others assert, there is also no question that the issue of causality has also been manipulated by politicians for a variety of motives. This would not be the first time politics has misused science. They have used the issue of environmental migrants to raise the alarm that the developed nations of the north, particularly Europe and the USA, will be inundated by millions of environmentally displaced peoples from the south. Some politicians make these claims to generate support for anti-immigrant policies, with the triage or lifeboat ethic that is covertly associated with that perspective. Others, such as former US Vice President Al Gore, use the spectre of millions of unfortunate environmental migrants rushing over the US borders to generate support for stabilisation of green house gases and other forms of climate change mitigation. Clearly related, the distortions that politics and the media engage in when discussing environmental migration constitute a serious concern, and it is incumbent on climate and migration researchers to clarify issues of causality when discussing the complexity and interrelationships of drivers in the displacement of populations.

7 CONCLUSION

Fundamental to all the objections to the terms 'environmental refugee' or 'environmental migrant' is the idea that nature is being blamed for basically human processes of ethnic or political violence, migration or famine, resembling a form of environmental determinism. Indeed, blaming nature does allow governments and development agencies to avoid their own responsibility in uprooting populations. The so-called natural disasters become the scapegoat for hunger, conflict and displacement that occur because of incompetent and/or corrupt management systems (Wisner, 2009). Again, this critique of the term 'environmental migrant' would merit consideration if the term 'environment' referred to 'nature', rather than

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to a context constructed by the dynamic interaction of human processes and natural processes that entrain specific outcomes or effects.

Therefore, a set of human derived and driven forces that are constructing the global environment, rather than an essential or pristine nature, are driving these processes. The distinction between nature and environment may seem perhaps merely semantic, but the terms we use must be precise if our understanding of the relationship between environment and migration is to advance. In climate change, nature will not be displacing people, but rather an array of human generated forces driven by massive production of green house gases that are transforming global climate and therefore nature. The wind, rain, drought, erosion and the like that displace people resemble natural forces, but their origins are becoming as much human as they are natural. They are environmental processes that combine human and natural forces and features. Therefore, although it may seem obvious, climate change is not something 'out there' but is fundamentally tied to both social and ecological processes driven by human action. Nevertheless, the language often used to discuss environmental migration continues to reflect an interacting but still dualistic separatism, ignoring the endogeneity of nature and society, particularly when discussing causality.

Although the recent report from the Global Humanitarian Forum (2009) estimated that as many as 20 million people would be displaced by climate change in 2009, at the moment, it is more probable in most cases that climate change effects are only making the daily challenges of survival worse for the majority of the world's most vulnerable people. Where displacement is occurring, it is generally the outcome of multiple factors, including environmental, political and economic causes. In fact, at present the problems afflicting the slum dwellers of Mumbai or the pastoralists of the high Andes, for example, are not rooted primarily in climate change, but rather in the conditions of poverty and exclusion that they are consigned to by the larger political economy encompassing their region, nation and the world. However, if predictions from the Intergovernmental Panel on Climate Change (IPCC, 2007a, 2007b) and other research organisations are even half right, and confidence in estimates for sea level rise, coastal erosion, desertification and other forces that may displace people is considerably higher than that, then we must be prepared for significant increases in the role environmental factors will play in displacement and involuntary migration in the relatively near future.

REFERENCES

Adamo SB. 2008. Addressing environmentally induced population displacements: a delicate task, A Background Paper for the Population-Environment Research Network Cyberseminar on "Environmentally Induced Population Displacements", 18–29 August 2008. www.populationenvironmentresearch.org

Adger WN, Paavola J, Huq S, Mace MJ (eds). 2006. *Fairness in Adaptation to Climate Change*. MIT Press: Cambridge.

Biermann F, Boas I. 2010. Preparing for a Warmer World: Towards a Global Governance System to Protect Climate Refugees. *Global Environmental Politics* **10**(1): 60–68.

Black R. 2001 Environmental refugees: myth or reality? UNHCR Working Papers (34): 1–19.

Black R, Adger WN, Arnell NW, Dercon S, Geddes A, Thomas DSG. 2011. The Effect of Environmental Change on Human Migration. *Global Environmental Change* **21s**: s3–s11.

Castles S. 2002. Environmental change and forced migration: making sense of the debate. UNHCR Working Papers (70): 1–14.

DOI: 10.1002/jid

Castree N. 2003. Geographies in the making. In *Handbook of Cultural Geography*, Anderson K, Domosh M, Pile S, Thrift N (eds). Sage Publications: London; pp. 168–183.

Christian Aid. 2007. Human Tide: the Real Migration Crisis. http://www.christianaid.org.uk/Images/humantide.pdf

CRED. 2008. EM-DAT: emergency events database. Available at http://www.emdat.be/

Crutzen PJ, Stoermer EF. 2000. The anthropocene. *Global Change Newsletter* **41**: 2–7.

Dessai S, O'Brien K, Hulme M. 2007. Editorial: on uncertainty and climate change. *Global Environmental Change* **17**: 1–3.

Dickens P. 2001. Linking the social and natural sciences. *Sociology* **35**: 93–110.

El-Hinnawi E. 1985. *Environmental Refugees*. United Nations Environmental Programme: Nairobi.

Fernando N, Warner K, Birkmann J. 2010. Is relocation a secondary disaster or an opportunity to vulnerability reduction. In *Environment, Forced Migration and Social Vulnerability*, Afifi T, Jager J (eds). IOM: Geneva.

Gemenne F. 2011. Why the numbers don't add up: a review of estimates and predictions of people displaced by environmental changes. *Global Environmental Change* **21s**: s41–s49.

Global Humanitarian Forum. 2009. *The Anatomy of a Silent Crisis*. Global Humanitarian Forum: Geneva.

Hartmann B. 2009. Climate refugees and climate conflict: who's taking the heat for global warming? In *Climate Change and Sustainable Development: New Challenges for Poverty Reduction*, Salih M (ed.). Edward Elgar: Cheltenham, Gloucester, UK.

Harvey D. 1996. *Nature, Justice and the Geography of Difference*. Blackwells: Oxford.

Hilhorst D. 2004. complexity and diversity: unlocking social domains of disaster response. In *Mapping Vulnerability: Disasters, Development and People*, Bankoff G, Frerks G, Hilhorst D (eds). Earthscan: London; pp. 52–66.

Holling CS. 1994. An ecologist view of the Malthusian conflict. In *Population, Economic Development, and the Environment*, Lindahl-Kiessling K, Landberg H (eds). Oxford University Press: New York.

Intergovernmental Panel on Climate Change (IPCC). 2007a. *Climate Change 2007: The Physical Science Basis, Summary for Policy Makers, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC: Paris.

Intergovernmental Panel on Climate Change (IPCC). 2007b. *Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability, Summary for Policy Makers, Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. IPCC: Brussels.

Jacobson J. 1988. *Environmental Refugees: A Yardstick of Habitability*. Worldwatch Institute: Washington, DC.

Koivurova T. 2007. International legal avenues to address the plight of victims of climate change: problems and prospects. *Journal of Environmental Law and Litigation* **22**: 267–299.

Kibraeb G. 1997. Environmental causes and impact of refugee movements: a critique of the current debate. *Disasters* **21**(1): 20–38.

Kotchen M, Young OR. 2007. Meeting the challenges of the anthropocene: toward a science of coupled human-biophysical systems. *Global Environmental Change* **17**: 149–151.

Latour B. 1993. *We Have Never Been Modern*. Harvard University Press: Cambridge.

Millenium Ecosystem Assessment. 2005a. *Ecosystems and Human Well-Being: Synthesis*. Island Press: Washington DC.

Millenium Ecosystem Assessment. 2005b. *Ecosystems and Human Well-Being: Desertification Synthesis*. World Resources Institute: Washington DC.

Murphy R. 2001. The internalization of autonomous nature into society. *The Sociological Review* **50**(3): 313–333.

DOI: 10.1002/jid

Myers N. 1997. Environmental Refugees. *Population and Environment* **19**(2): 167–182.

Nakicenovic N, Swart R. 2000. *Emissions Scenarios. Special Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press: Cambridge.

Nicholls RJ, Wong PP, Burkett VR, Codignotto JO, Hay JE, McLean RF, Ragoonaden S, Woodroffe CD. 2007. Coastal systems and low-lying areas. In *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE (eds). Cambridge University Press: Cambridge.

Oliver-Smith A. 2003. Theorizing disasters: nature, culture, power. In *Culture and Catastrophe: The Anthropology of Disaster*, Hoffman SM, Oliver-Smith A (eds). The School of American Research Press: Santa Fe, New Mexico.

Oliver-Smith A. 2009. Nature, society and population displacement: toward an understanding of environmental migration and social vulnerability, InterSecTions No. 8. Bonn: United Nations University Institute for Environment and Human Security.

Perrow C. 1999. *Normal Accidents: Living with High Risk Technologies*. Princeton University Press: Princeton.

Redmond, Charles L. 1999. *Human Impact on Ancient Environments*. University of Arizona Press: Tucson.

Renaud F, Bogardi J. 2007. Forced Migrations due to degradation of aris lands: concepts, debate and policy requirements. In *Desertification and International Policy Imperative*, King C, Bigas H, Adeel Z (eds). Proceedings of a joint international conference, Algiers, Algeira 17–19, December 2006. UNU Desertification Series No. 7. United Nations University, Tokyo, Japan; pp. 24–34.

UNHCR. 2009. Climate change, natural disasters and human displacement: a UNHCR perspective. http://www.unhcr.org/cgi-bin/texis/vtx/home/opendocPDFViewer.html?docid=4901e81a4&query=displacement%20scenarios

Vitousek, PM, Mooney HA, Lubchenco L, Melillo JM. 1997. Human domination of the earth's ecosystems. *Science* **277**(25 July): 494–499.

Warner K, Hamza M, Oliver-Smith A, Renaud F, Julca A. 2010. Climate change, environmental degradation and migration, *Natural Hazards* **55**: 689–713.

Whatmore S. 2002. *Hybrid Geographies*. Sage Publications: London.

Wisner B. 2009. Climate change and migration: scientific fact or leap of (bad) faith? Invitation to a debate and Radix collection of materials elucidating debate & the assumptions & politics in the background. Radix. http://radixonline.org/ccm.html [8/7/09].

Wisner B, Blaikie P, Cannon T, Davis I. 2004. *At Risk: Natural hazards, people's vulnerability and disasters* (2nd edn.). Routledge: London, pp. 11.

Young OR, Berkhout F, Gallopin GC, Janssen MA, Ostrom E, van der Leeuw S. 2006. The globalization of socio-ecological systems: an agenda for scientific research. *Global Environmental Change* **16**: 304–316.

DOI: 10.1002/jid