

**Helpdesk Research Report: Climate Change and Migration**  
04.09.09

**Query:** How will climate change affect the movement of people living in developing countries?

**Enquirer:** DFID Migration Team

## Contents

1. Overview
2. Framing the debate
3. Trends and patterns of migration
4. Selected case studies
5. Recent expert meetings on climate change and migration
6. Forthcoming resources
7. Additional information

## 1. Overview

The debate on the environmental drivers of migration and displacement has existed since the 1970s and there is a vast body of literature on the subject. With the recent emergence of climate change as a major issue of concern, there has been a surge in research on the specific links between climate change and migration over the past five years, although this is very much in its infancy. It is this body of research which is the focus of this helpdesk report. Whilst far from a comprehensive review of the literature, it aims to cover the range of perspectives represented.

The difficulty of making predictions of future patterns of climate change migration<sup>1</sup> is noted widely both in the literature and by a number of experts contacted in the course of this research. According to one commentator, “climate change is an extremely complicated and complex process. Migration is equally a field of study in its own right. Drawing any direct causal relationships is not only methodologically wrong, it’s dangerous.”

The principle difficulty springs from the fact that, methodologically, it is very difficult if not impossible to unpack the different environmental drivers and triggers of migration. People move for complex sets of reasons of which a changing environment is only one. As such it is important to try to understand the impacts of a variety of factors including social dynamics, institutional capacities, demographic growth, inter-community tensions, social cohesion, natural resource management, poverty, politics and power. The general view is that the movement of people is

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<sup>1</sup> Terms and concepts such as environmental or climate change migration, environmentally-induced or forced migration, ecological or environmental refugees, and climate change refugees are used throughout the literature, with no general agreement on precise definitions. The lack of definitions is attributed to: a) the challenge of isolating environmental factors from other migration drivers, and b) the possible legal and governance implications of defining this range of environmentally-related migration. For the purpose of this report the term “climate change migration” is used.

more closely linked to those dimensions of social systems than to the transformation of ecosystems. In this context, one expert has suggested that rather than looking at environmental 'hotspots' as potential sources of migrants, it may be more useful to think of 'hot systems' where all these factors interact.

Nevertheless there have been some attempts at making projections of future climate change migration varying from 25 to 50 million by the year 2010 (Myers, 2001) to 200 million by 2050 (Brown, 2008). However, these figures are given little credence in academic circles, given that we do not even know how many people are *currently* displaced by natural disasters, let alone by *climate related* natural disasters, and even less so by *climate change related* disasters. As noted above, a fundamental problem is that there is no agreed method of defining or indeed measuring climate induced migrants.

Because of this lack of data, it has been suggested that it is more important to move forward on a case study basis using both quantitative and qualitative information. One important initiative in this respect is the EU funded Environmental Change and Forced Migration Scenarios (EACH-FOR) project <http://www.each-for.eu/index.php?module=main>. Other commentators insist that it is more appropriate to think in terms of "climate variability" rather than "climate change", to link up with what people experience now, instead of using models of future climate change. One such approach is taken by the Norwegian Refugee Council's Internal Displacement Monitoring Centre (IDMC) and OCHA, who have so far focused on sudden onset disasters where the links to migration are much more explicit. This is seen as a first step in getting reliable estimates of current climate-related disaster displacement, as a baseline for future research.

In terms of broader trends and patterns which might be identified with regards to climate change and migration, the empirical research does not support the claim that climate change will trigger waves of South-North interregional migration. Most displacements are likely to be within country borders. Migration is generally a stepped process and tends to follow a rural – nearest local urban – urban pattern. Urban – rural migration has not, as yet, been witnessed. Cross-border migration, where it does exist, is likely to happen within existing social networks, especially in sub-Saharan Africa.

Longer term changes in conditions may result in longer term displacements. Initially the bulk of population movements is expected to be disaster driven. They may become longer term in situations where either the environment is no longer able to promote return or where other vulnerabilities (extreme poverty, social trends etc) make return impossible. Nevertheless, these movements are still unlikely to be international.

A number of experts have noted that livelihoods are likely to represent the single most important link between climate change and migration. Thus, those aspects of climate variability most likely to affect migration are the ones which impact on environmentally based livelihoods and are location-specific. Water availability for rain-fed agriculture and pasture lands, and in some irrigated systems, is likely to be an important issue. The difference between small island states subjected to sea level rise (such as the high profile cases of Tuvalu and the Maldives) and the impact in Sub-Saharan Africa is also highlighted.

Another point often made in the literature is that those most vulnerable to both climate change and forced migration have the least resources to undertake long-distance migration, so are often left behind.

The extent to which new migratory trends are likely to emerge as a result of climate change is still unclear. Some argue that, as a 'threat-multiplier' climate change is more likely to exacerbate existing problems although it is unclear by how much. Others argue that new trends are likely to emerge (e.g Alaska, Pacific islands) but there is currently only limited case study evidence for this. One way to approach the question may be to look at the extent to which current migratory

flows correlate with changes in the environment. Internationally at least, there appears to be very little correlation.

Given these uncertainties it is difficult to make any clear policy recommendations. Much of the literature stresses the importance of focusing on sustainable ecosystems, although it is recognised that some places may be well beyond this point already (e.g Darfur). Adaptation and disaster-risk reduction in developing countries are also seen as key to minimising the 'push' factor of climate change given that individual migration is most often the expression of the incapacity of communities to cope with change and uncertainty. Importantly however, this view is challenged by some commentators who argue that mobility can be an important (positive) strategy to reduce vulnerability to both environmental and non-environmental risks.

In terms of legal frameworks for environmentally induced migrants there is much disagreement. In academic circles at least the most common view appears to be that existing legal frameworks are probably sufficient, although policy still needs to translate into practice. Whether 'environmental refugees' should be given special status is also hotly contested, although, once again, there appears to be some scepticism amongst academics about how appropriate the term is, given the great uncertainties surrounding the climate change–migration link and the legal permutations.

Another issue explored in the literature is that of relocation or resettlement as a response to climate related natural disasters. Whilst it is acknowledged that in some exceptional cases this may be necessary, extreme caution is urged. It is noted that resettlement often exposes displaced people to the loss of livelihoods, debt, social disarticulation and potential resentment and conflict in the receiving area. Increasing population densities in the receiving location may also negatively affect the environment. Furthermore, according to one expert, resettlement has great potential for abuse. It is a highly political issue and climate change/natural disasters can be used by governments to justify controversial policies (e.g relocation in Sri Lanka following the 2006 Tsunami).

## 2. Framing the debate

**Myers, N., 2001, 'Environmental refugees: a growing phenomenon of the 21st century', the Royal Society <http://www.nicholas.duke.edu/people/faculty/myers/myers2001.pdf>**

This oft-cited paper makes the case for "a new phenomenon in the global arena: environmental refugees." According to Myers, in 1995, environmental refugees totalled at least 25 million people, compared with 27 million traditional refugees (people fleeing political oppression, religious persecution and ethnic troubles). Moreover, according to his estimates, there could in future be as many as 200 million people overtaken by sea-level rise and coastal flooding, by disruptions of monsoon systems and other rainfall regimes, and by droughts of unprecedented severity and duration.

**Black, R., 2001, 'Environmental refugees: myth or reality?', UNHCR [http://www.humansecuritygateway.info/documents/UNHCR\\_EnvironmentalRefugees\\_MythOrReality.pdf](http://www.humansecuritygateway.info/documents/UNHCR_EnvironmentalRefugees_MythOrReality.pdf)**

This paper questions the value of international policy-makers focusing on 'environmental refugees' as a significant group of migrants, deserving of the world's attention. It argues that although environmental degradation and catastrophe may be important factors in the decision to migrate, and issues of concern in their own right, their conceptualisation as a primary cause of forced displacement is unhelpful and unsound intellectually, and unnecessary in practical terms. Particular reference is made to three categories of supposed 'environmental refugees': those

fleeing 'desertification'; those displaced (or potentially displaced) by sea level rise; and victims of 'environmental conflict'.

**Morrisey, J., 2009, 'Environmental Change and Forced Migration. A State of the Art Review', background paper for RSC Workshop on Environmental Change and Displacement: Assessing the Evidence and Developing Norms for Response, 8-9 January**  
<http://www.rsc.ox.ac.uk/PDFs/Environmental%20Change%20and%20Forced%20Migration%20Review%20-%20Morrisey.pdf>

A popular claim is that there is a dearth of empirical work on the relationship between environmental change and migration. According to Morrisey, this lack of evidence has been cited as a justification for running headlong into potentially ill-advised policy, with a popular defence of simplistic models being that "one is better off being approximately right than exactly wrong". Contrary to this, Morrisey argues that there is a significant body of empirical work on the relationship between environmental change and migration.

In his assessment of the current state of research on the relationship between environmental change and human mobility, Morrisey finds that the debate has become highly polarised and often unhelpful. Broadly speaking, the maximilist school, despite being heavily criticised for its simplistic approach, continues to influence the popular literature. Myers, in particular, is repeatedly cited, and the peer reviewed status of his work means that figures remain largely unquestioned. Aid organisations' citation of large figures also has a heavy influence on popular discourse and imaginations..

However, the major growth in academic literature on this topic has been located, principally, within the minimalist school. Although authors within the minimalist paradigm remain critical of the simplistic framework of the maximilist school, initial reluctance to use the term 'environmental refugee/migrant' – due to the complex set of factors thought to influence migration – has declined with a growing appreciation of the fact that an understanding of the interplay between economic, environmental and developmental forces in driving migration is valuable and that the term 'environmental migrant' highlights this complex relationship

Policy circles remain by nature an important intersection between academic and popular debates. For instance, the IPCC adjusted their tone, formerly so dependent on maximilist school findings, following the publication of dissenting viewpoints from within the minimalist school.

From his review of the empirical evidence on the links between environmental change and migration, Morrisey draws a number of lessons:

- as paleoclimatic studies show, there does appear to be an important link between (climatically driven) environmental change and migration. Such migration, it appears, could well prove to be large scale and permanent, fundamentally shifting the distribution of populations. In addition to this, the empirical evidence makes clear the case for some form of migration as a response to once off shocks. Notable within these findings though is the importance of the economic, cultural and socio-political context which acts to modify and influence the many different features of any migration.
- environmentally related migrations may take both temporary and more permanent forms. Once off extreme events tend to generate short term, short distance migrations (although this is not always the case) while longer onset, and more permanent changes to the environment tend to generate longer distance more permanent migrations (even if such migrations take place as a sequence of small scale moves).
- Short distance, cyclical moves tend initially to take the form of an intensification of existing migratory pathways, or slightly modified ones. Moreover, it appears that impoverished groups are less able to invest in migration and therefore the least likely to migrate.

- the political context is enormously important in determining the degree to which migration might be enacted as a response to environmental change. Here the role of both governmental and non-governmental actors in providing relief/support/assistance is crucial in understanding the character (or existence) of a migratory response.
- it appears that the best predictor of migration may well not simply be the scale of the damage – measured in some generic way – but rather the manner in which such damage impacts upon people’s livelihoods and cultural practices. Having said this, in the case of rapid onset disasters, immediate migratory responses are usually best predicted by intensity of damage.
- mobility will be enacted in response to environmental change by groups who are most mobile – lack land ownership, are not reliant on local social networks, have small families and have access to capital. As such we need to appreciate that migration is enacted as a response when it fits with the entire suite of livelihood/coping/adaptation strategies employed by a household or individual.

See also: **Castles, S., 2002, ‘Environmental change and forced migration: making sense of the debate, UNHCR** <http://www.imi.ox.ac.uk/pdfs/environmental-change-and-forced-migration>

The introduction to this paper (pp 1-3) examines the two starkly contrasting bodies of work by the influential authors Norman Myers and Richard Black on the linkages between environmental change and migration.

### 3. Trends and patterns of migration

**Christian Aid, 2007, ‘Human tide: The Real Migration Crisis’, Christian Aid, London**  
<http://www.christianaid.org.uk/Images/human-tide.pdf>

This report from Christian Aid suggests that the number of internally displaced people (IDPs) is expected to rise dramatically in the coming decades and will at least double because of climate change. “The impact of climate change is the great, and frightening, unknown in this equation. Existing estimates of its potential to displace people are more than a decade old and are widely disputed.” In this context, the report predicts that on current trends, the combined effects of climate change, conflict, natural disasters and development projects that drive displacement could result in a further 1 billion people being forced from their homes between now and 2050.

**OCHA and NRC, 2009, ‘Natural disasters and forced displacement in the context of climate change’, policy brief based on the findings of the forthcoming OCHA-IDMC study, 8 June**  
<http://www.nrc.no/arch/ img/9412026.pdf>

The lack of reliable estimates of disaster-related forced displacement makes it difficult for policy makers to take it into account in the context of climate change adaptation. In this context, this policy brief based on a forthcoming OCHA-IDMC study develops an estimate of forced displacement related to natural disasters in 2008, and proposes a methodology for monitoring disaster-related forced displacement on an annual basis<sup>2</sup>. It finds that at least 36 million people were displaced by sudden-onset natural disasters in 2008. Of those, over 20 million were displaced by climate-related disasters, while almost 16 million were displaced by non-climate-related disasters. This compares to the 4,6 million newly internally displaced by conflict in the same period.

<sup>2</sup> Based on: Jose Rodriguez Femke Vos Regina Below D. Guha-Sapir, 2009, ‘Annual Disaster Statistical Review 2008 The numbers and trends’, Centre for Research on the Epidemiology of Disasters, Brussels  
[http://www.emdat.be/Documents/Publications/ADSR\\_2008.pdf](http://www.emdat.be/Documents/Publications/ADSR_2008.pdf)

see also: **IASC, 2008, 'Climate Change, Migration and Displacement: Who will be affected?'**, working paper submitted by the informal group on Migration/ Displacement and Climate Change of the IASC, 31 October <http://unfccc.int/resource/docs/2008/smsn/igo/022.pdf>

**Kniveton, D., Schmidt-Verkerk, K., Smith, C. and Black, R., 2008, 'Climate Change and Migration: Improving Methodologies to Estimate Flows'**, report prepared for the International Organization, Geneva  
[http://www.reliefweb.int/rw/lib.nsf/db900sid/PANA-7FNH8T/\\$file/IOM\\_june2008.pdf?openelement](http://www.reliefweb.int/rw/lib.nsf/db900sid/PANA-7FNH8T/$file/IOM_june2008.pdf?openelement)

This report outlines the key elements of natural and human-induced climate change of potential relevance to migration; discusses the current state of the debate about the relationship between climate change and migration and describes approaches to further understanding of climate change-related migration.

Chapter B (pp 29 -34) finds that the number of empirical studies of the influence of climate on migration is surprisingly small. Of these, empirical results of the impact of drought on migration have found that drought seems to cause an increase in the number of people who engage in short-term rural to rural types of migration, but does not affect, or even decrease international, long-distance moves. Thus the assumption that climate variability leads to migration in a linear way is not supported by empirical investigation. Many other factors play into the nexus between climatic factors and migration.

In light of these findings, chapter C (pp 37-40) emphasises the need to understand to what extent climate is a relevant factor in the decision-making process and whether climate change and variability influence the choice of destination, the length of stay and the number of migrants sent. Two possible approaches are suggested: the Sustainable Livelihoods Approach (SLA) and the New Economics of Labour Migration (NELM). In addition, quantitative methods of statistical regression and agent based modelling are recommended in order to integrate the multiple variables involved in migration.

**Black, R. et al., 2008, 'Demographics and Climate Change: Future Trends and their Policy Implications for Migration'**, Development Research Centre on Migration, Globalisation and Poverty, University of Sussex, Brighton  
[http://www.unicef.org/socialpolicy/files/Demographics\\_and\\_Climate\\_Change.pdf](http://www.unicef.org/socialpolicy/files/Demographics_and_Climate_Change.pdf)  
summary: [http://www.unitar.org/ny/sites/default/files/DfID%20report\\_summary%2013%20Jan.pdf](http://www.unitar.org/ny/sites/default/files/DfID%20report_summary%2013%20Jan.pdf)

This paper proposes an alternative to the standard approach to linking climate change and migration (identifying areas affected by climate change, counting the number of people living there, and using this to estimate the number likely to be forced to leave). The alternative approach is to identify existing migration patterns and examine how demographic trends and climate change may affect the drivers of these specific migrations.

Taking this approach, the authors find that existing migration patterns in Africa are dominated by internal and intra-regional movements, with relatively limited movement beyond to Europe and North America. Key migration drivers include the 'push' of political instability and conflict, lack of economic opportunities, and lack of access to resources (including as a result of climate variability and shocks); they also include the 'pull' of employment, demand for workers and kin or social networks. There are also a number of intervening factors that influence the extent and patterns of migration, including aid and immigration policies that seek to stop people moving, but which frequently do not work.

Combining projected trends for demographics and climate change with current migration patterns, they find that the following impacts may be expected:

- Climate change impacts are likely to be more substantial where 'push' drivers of migration coincide with high vulnerability to climate change and low capacity to adapt. In such areas (e.g. the Sahel, highlands of Ethiopia), the pressure to migrate is likely to increase.
- Internal and cross-border movements appear more susceptible to climate change impacts than long-distance international movements, as economic losses associated with climate change may prevent people investing in overseas migration and force them to look for work elsewhere locally;
- Conflict-driven migration may be exacerbated by climate change, particularly where this exacerbates conflict over natural resources (e.g. Darfur);
- Temporary, short-distance 'distress' migration is likely to rise as a consequence of climate shocks, (e.g. droughts in the Sahel or floods in Volta, Okavango and Niger deltas). However, the numbers affected may be lower if prior anticipatory migration occurs in response to increased climate vulnerability;
- Some migration streams driven by the 'pull' of economic opportunity may also be affected by climate change, including reduced opportunities for seasonal work in Eastern Sudan or Central Ghana and increasing employment opportunities in agriculture outside Africa;
- Coastal or low-lying areas will be vulnerable to sea level rise and increased flood hazards; this, combined with increased overcrowding in urban areas carries a risk of secondary migration.

Policy implications and conclusions are:

- The most important response is the strengthening of adaptive capacity of affected populations, including agricultural diversification and investment in disaster risk reduction and early-warning systems, including speedy and efficient humanitarian responses.
- The removal of barriers to internal mobility could play a role in facilitating the diversification of rural livelihoods. Given the poorest and most vulnerable are least likely to move, continued attention to pro-poor policies is needed in rural source areas.
- Attention needs to be paid to urban planning, service provision and human security in areas where people are already migrating – especially in slum areas of major coastal cities where population growth is likely to accelerate.
- The capacity of urban labour markets to absorb large and youthful migrant populations needs particular attention if secondary migration is to be avoided.
- Support could be provided to initiatives to defuse tensions and encourage peaceful cohabitation of both internal and intra-regional migrants and local populations.
- There is a need for further discussion on the responsibility to protect those who may be forced to leave their homes, and especially their countries, due to climate shocks.
- There is a need for further research evidence on the role of migration in adapting to climate change in particular national and regional contexts, and on the impact of climate change on "pull" factors of migration in destination areas.

**Brown, O., 2008, 'Migration and Climate Change', International Organization for Migration, Geneva <http://www.iisd.org/publications/pub.aspx?id=954>**

This report looks at the ways that climate change might lead to increased migration and analyses some predictions for numbers of future climate migrants. It lays out three different tentative scenarios on future numbers of migrants arguing that which (if any) of these comes to pass depends on future population growth, distribution and resilience to environmental pressures as well as the ability of the international community to curb greenhouse gas emissions and help the poorest countries adapt to the impacts of climate change.

The key message is that the consequences of climate change for human population distribution are unclear and unpredictable, given that they depend on many other social, economic and

environmental factors. Interestingly, Brown notes that climate change may make some places *better able* to sustain larger populations (e.g. Europe, Australia). As such, he argues, “it is not inconceivable then that there might be migration in order to take advantage of the effects of climate change.”

He also notes that temporary migration as an adaptive response to climate stress is already apparent in many areas. “But the picture is nuanced; the ability to migrate is a function of mobility and resources (both financial and social). In other words, the people most vulnerable to climate change are not necessarily the ones most likely to migrate.”

From a policy perspective, Brown notes that large-scale migration is not yet taken into account in national adaptation strategies, which tend to see migration as a “failure of adaptation”. Thus, there is a need for international recognition of the problem, a better understanding of its dimensions and a willingness to tackle it. Recommendations include:

- The international community needs to acknowledge formally the predicament of forced climate migrants.
- Development and adaptation policies in potential source countries of forced climate migrants need to focus on reducing people’s vulnerability to climate change, moving people away from marginal areas and supporting livelihoods that are more resilient.
- A great deal more research is needed to understand the causes and consequences of climate migration and to monitor numbers.
- The international community needs to help generate incentives to keep skilled labour in developing countries but also to allow developing countries to capitalize on the benefits that fluid labour markets can bring.

**Raleigh, C., Jordan, L. and Salehyan, I., 2008, ‘Assessing the Impact of Climate Change on Migration and Conflict’, World Bank, Washington**  
[http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper\\_MigrationandConflict.pdf](http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/SDCCWorkingPaper_MigrationandConflict.pdf)

This paper reviews case studies of natural disaster affected communities, their migration practices, and government policies, in order to offer projections on future migration patterns in response to the direct and indirect changes due to climate change. It finds that a short to medium term increase and intensification of typical labour migration should be expected out of degraded and drought/famine areas, while initial local displacement will characterize movements from sudden onset disaster areas. A small share of migrants may choose to permanently relocate (case studies have noted a range from none to 30%). No mass migrations should or are expected to occur. These findings deviate substantially from more egregious estimates from the ‘environmental refugee’ literature, mainly because such discussions fail to take into account human reaction and adaptation to change.

Furthermore, the paper finds that:

- Disasters vary considerably in their potential to instigate migration. Moreover, individual, community and national vulnerabilities shape responses as much as disaster effects do.
- Individuals and communities in the developing world incorporate environmental risk into their livelihoods. Their ability to do so effectively is contingent upon their available assets. Diversifying income streams is the predominant avenue through which people mitigate increased hazards from climate changes. Labour migration to rural and urban areas is a common component of diversified local economies. In lesser developed countries, labour migration is typically internal, temporary and circular.
- During periods of chronic environmental degradation, such as increased soil salinisation or land degradation, the most common responses by individuals and communities is to

- intensify labour migration patterns. By doing so, families increase remittances and lessen immediate burdens to provide.
- With the onset of a sudden disaster or the continued presence of a chronic disaster (i.e. drought or famine), communities engage in distress migration patterns. The characteristics of distress migration are quite different within and across countries as they are shaped by the severity and geography of a crisis, the ability of a household to respond, evacuation opportunities, existing and perpetuating vulnerabilities, available relief, and intervening government policies.
  - As environmental migration is typically internal and short term, the potential for instigating conflict is quite minimal. However, unstable urban and rural demographics are related to higher risks of civil war and low level communal conflicts during periods of environmental stress are common.

**Warner, K., Ehrhart, C., de Sherbinin, A., Adamo, S. and Chai-Onn, T., 2009, 'In Search of Shelter. Mapping the Effects of Climate Change on Human Migration and Displacement', Care International, Chatelaine, Switzerland**

[http://www.care.org/getinvolved/advocacy/pdfs/Migration\\_Report.pdf](http://www.care.org/getinvolved/advocacy/pdfs/Migration_Report.pdf)

The point of departure for this paper is the underlying hypothesis that environmental change affects human mobility most directly through livelihoods which are dependent on ecosystem services, such as agriculture, herding and fishing. This hypothesis is based on findings from the Environmental Change and Forced Migration Scenarios (EACH-FOR) project, during which researchers carried out interviews with migrants, the majority of whom indicated that if the environment had affected a decision to migrate, it was most often because environmental changes had made it difficult for the individual or family to earn a living. Thus the report finds that the influence of environmental change on human mobility is discernible and growing. However, the report does not attempt to provide estimates of forced migrants, to indicate specific geographical destinations, or to draw causal relationships between climate change and migration or displacement.

Another important message is that, whilst some forms of environmental change, including sea-level rise and glacier melt, may require large-scale government action, some interventions can leave people no better off, or even worse, than before. Resettlement, for example, can carry high costs including cultural degradation, lost livelihoods, reduced access to social services, and the loss of employment networks.

Other key findings include:

- Disasters continue to be a major driver of shorter-term displacement and migration. As climate change increases the frequency and intensity of natural hazards such as cyclones, floods, and droughts, the number of temporarily displaced people will rise.
- Seasonal migration is likely to become even more common.
- Glacier melt will affect major agricultural systems in Asia resulting in increased short-term flood risks, followed by decreasing water flows in the medium- and long-term, threatening food production.
- Sea level rise will worsen saline intrusions, inundation, storm surges, erosion, and other coastal hazards, especially for island communities. In the densely populated Ganges, Mekong, and Nile River deltas, a sea level rise of 1 metre could affect 23.5 million people and a sea level rise of 2 meters would impact an additional 10.8 million people.
- Many people won't be able to flee far enough to adequately avoid the negative impacts of climate change—unless they receive support. Migration requires resources (including financial, social, and political capital) that the most vulnerable populations frequently don't have. Case studies indicate that poorer environmental migrants can find their destinations as precarious as the places they left behind.

The report recommends the following principles and commitments for action by stakeholders at all levels:

- Reduce greenhouse gas emissions to safe levels.
- Protect the dignity and basic rights of persons displaced by climate change.
- Increase people's resilience to the impacts of climate change so that fewer are forced to migrate.
- Establish mechanisms and binding commitments to ensure that adaptation funding reaches the people that need it most.
- Recognise and facilitate the role that migration will inevitably play in individual, household and national adaptation strategies.
- Integrate climate change into existing international and national frameworks for dealing with displacement and migration.
- Strengthen the capacity of national and international institutions to protect the rights of persons displaced by climate change.

**Warner, K., Hamza, M., Oliver-Smith, A., Renaud, F. and Julca, A., 2008, 'Climate Change, Environmental Degradation & Migration', special paper no. 15 in Natural Hazards**  
<http://www.springerlink.com/content/387xp37011790811>

This paper focuses on how environmental change and environmental hazards contribute to the migration through exploring the mechanisms through which vulnerability and migration are linked—via livelihoods, relocation policies, and other factors. It draws on multi-disciplinary literature including ecology, environment and climate change; sociology of migration; anthropology of displacement; and economics; and on preliminary case studies from Egypt, Vietnam and Mozambique. Analysis of the cases reveals three points relevant to future environmentally influenced migration.

#### 1) Multi-factors in environmentally-influenced migration

While acknowledging that economic and social factors are currently the main drivers of migration, an environmental element was detected in each area that contributed to migration. The case studies of Egypt, Vietnam and Mozambique highlight water shortage, land degradation and floods as significant underlying triggers in human movements. Other stresses such as poverty, high population growth and density, and a low level of economic development exacerbate the situation even further. As these factors are all intertwined, it is difficult to separate one from the other. Also conflict can be traced back to environmental stressors.

A central question to all the case studies is the degree to which environmental factors contribute to displacement or migration. Environmental degradation currently seems not to be a *major* cause for migration in the studied cases. However for the case of the Zambezi River valley, it has been shown after an individual flood event people will be displaced on a temporary basis, generally during the flood emergency period. Following re-occurring flooding events, people tend to be either relocated or migrate on a permanent or semi-permanent basis.

Another pressing question involves differential vulnerability to environmentally forced migration. Not everyone is vulnerable in the same degree to environmental change. In some cases, social class or occupation may cushion against the impacts of environmental change. In other cases, the unequal or distorted application of governmental assistance programmes may protect some groups and expose others to pressures to migrate.

#### 2) Migration and socio-ecological tipping points

Current migration patterns manifest "spikes" of migration when the threshold of socio-ecological tipping points has been reached or crossed. However, tipping points are very complex to measure let alone predict. Environmental and social monitoring functions, such as famine early

warning systems, will prove crucial in predicting and ascertaining when threshold are exceeded and populations will be pressured to migrate.

Each case study presented here has a different context and set of environmental stressors. What is common in the three cases is that the adaptive capacity of particular groups of people is stretched to a point that migration becomes one of the few options left for safety and livelihoods in the face of worsening conditions at home. In each case, current migrants have noted that poor environmental conditions or some rapid onset event such as flooding has been a factor in the migration decision. Moreover, in some areas upwards of 70% of non-migrant respondents indicated that migration would become necessary for them if their environments become further degraded. By the same token, given properties of ecological resilience or restoration efforts in some contexts of environmental degradation, permanent migration may not be necessary in all cases.

### 3) Government responses

Government responses vary from incentives to mandated resettlement, with mixed results. Resettlement often exposes displaced people to the loss of livelihoods, debt, and social disarticulation. Traditional social structures may become fragmented. Another problem with resettlement is the reciprocal relationship between conflict and migration. Increasing densities of population in the receiving location can negatively affect the environment. Resource depletion can contribute to conflicts between migrants and local inhabitants. Violent conflicts in turn can destroy landscapes and severely damage the environment, which again can lead to further migration flows.

See also: **UNU-EHS, 2008, 'Human Security, Climate Change and Environmentally Induced Migration', United Nations University - Institute for Environment and Human Security, Bonn** [http://www.efmsv2008.org/file/ELIAMEP+full+report\\_final-1.pdf?menu=54](http://www.efmsv2008.org/file/ELIAMEP+full+report_final-1.pdf?menu=54)

See also: **Renaud, F., Bogardi, J., Dun, O. and Warner, K., 2007, 'Control, Adapt or Flee. How to Face Environmental Migration?', UNU-EHS, Bonn** <http://www.unitar.org/ny/sites/default/files/2007%20-%20Renaud%2C%20Bogardi%2C%20Dun%2C%20Warner%20-%20Control%2C%20Adapt%20or%20Flee%20How%20to%20Face%20Environmental%20Migration.pdf>

**Refugees Studies Centre, 2008, 'Climate change and displacement', Forced Migration Review, Issue 31, October** <http://www.fmreview.org/FMRpdfs/FMR31/FMR31.pdf>

This special issue of the Migration Review contains 36 short articles about the link between climate change and migration. The subjects of the articles include methodologies to improve estimates of migration flows related to climate change, definitions of and terminology used for people who are migrating as a consequence of climate change, the implications for policies as well as a variety of case studies.

**Tacoli, C., 2009, 'Crisis or adaptation? Migration and climate change in a context of high mobility', Expert Group Meeting: Population Dynamics and Climate Change, London, 24-25 June** <http://www.unfpa.org/webdav/site/global/users/schensul/public/CCPD/papers/Tacoli%20Paper.pdf>

This paper questions the view that migration reflects a failure to adapt to changes in the physical environment, arguing instead that mobility, in conjunction with income diversification, is an important strategy to reduce vulnerability to environmental and non-environmental risks – including economic shocks and social marginalisation. Thus, it is argued, what is needed is a radical change in perceptions of migration and a better understanding of the role that local and

national institutions need to play in making mobility be seen as part of the solution rather than the problem.

Moreover, Tacoli argues that most estimates of future environmentally induced migrants are in fact estimates of the numbers of people at risk rather than the number of people who are effectively likely to move. As such, the best approximation is to use past and current experiences as analogous to climate change-induced drought, desertification and land degradation, extreme weather events such as floods and hurricanes and, to a much lesser extent, sea level rise.

Her findings suggest that environmental degradation does not inevitably result in migration. Where it does, it is likely that movement is predominantly short term, as in the case of extreme weather events and natural disasters, and short distance, as in the case of drought and land degradation. In the case of rising sea level, much less can be inferred from past experience, and the number of people forced to move will depend on adaptation initiatives as well as wider national planning strategies. Furthermore, the significance of non-environmental factors in migration, the uncertainty on the extent of changes in rainfall patterns and tropical cyclone/hurricane/typhoon frequency and strength as a consequence of climate change, and the fact that predictions only go as far as the next 50 years are serious limitations for any realistic long-term assessment of the link between climate change and migration.

**Gleditsch, N. P, Nordås, R. and Salehyan, I., 2007, 'Climate Change and Conflict: The Migration Link', Coping With Crisis Working Paper, International Peace Academy, New York [http://www.ipacademy.org/media/pdf/publications/cwc\\_working\\_paper\\_climate\\_change.pdf](http://www.ipacademy.org/media/pdf/publications/cwc_working_paper_climate_change.pdf)**

Chapter 3 of this paper (pp 4-7) focuses on what the authors believe to be a plausible link between climate shifts and problems for human security: mass migration. According to this school of thought, climate change is likely to be a significant factor leading to mass exodus from increasingly uninhabitable areas, and population shifts stemming directly or indirectly from environmental pressures can place significant burdens on migrant receiving areas.

The authors argue that, environmental change can contribute directly to migration by pushing people out of uninhabitable areas. Sea-level rise caused by a reduction in glacial coverage may lead to the flooding of coastal areas. Low-lying, coastal regions may be evacuated as water encroaches upon human habitats. Desertification may cause people to migrate out of unproductive and water-scarce areas. Greater variability in weather patterns lead to dramatic climate events such as hurricanes, typhoons, and extreme cold which may disrupt human settlements. And unpredictable rainfall will lead to periods of flooding and drought, making certain areas uninhabitable.

They also find that environmental stresses may also lead to migration indirectly. Resource scarcity and competition can lead to conflict within a country or region, and such conflict may increase emigration.

**German Advisory Council on Global Change, 2008, 'Climate Change as a Security Risk', Earthscan, London/Sterling [http://www.wbgu.de/wbgu\\_jg2007\\_engl.pdf](http://www.wbgu.de/wbgu_jg2007_engl.pdf)**

Chapter 6.5. (pp 116-129) of this report explores environmentally induced migration as a potential 'conflict constellation'. It first notes that the opportunities and risks associated with environmentally induced migration are hotly debated and that the effects of migration in general are multifaceted. Moreover, figures for the number of environmental migrants worldwide vary depending on the definition and source data used.

However, it argues, the structure of environmentally induced migration can be described with greater certainty. It is thought likely that most such migration currently takes place within national

borders and that this will continue to be the case in future. Most cross-border environmentally induced migration will probably take the form of south-south migration; no trend towards large south-north migrations has been identified. It is also thought likely that gradual environmental degradation will cause significantly more people to migrate than weather extremes; The link between gradual soil degradation and migration is already recognized in the Desertification Convention (UNCCD).

The chapter then analyses the link between environmental changes and environmentally induced migration through four driving factors or 'influence dimensions' (p 120):

- *Individual attributes*: Environmentally induced migration is usually chosen by an individual as a coping strategy. The decision to migrate is therefore significantly determined by individual attributes such as age, level of education, the degree of traumatisation after natural disasters and the subjective perception of general structural conditions. In addition, case studies reveal the importance of a history of migration.
- *Vulnerability*: The extent of environmentally induced migration is also influenced by the extent to which the effects of environmental changes and a range of political and socio-economic factors have an impact on them. These factors may overlay or reinforce each other. For example, families' economic vulnerability may be increased by unfavourable aspects of the regional economic structure or the level of regional economic activity, such as a low or markedly fluctuating per capita income, unequal rights of ownership, restrictions on access to markets (labour, credit or sales markets) or the absence of social security arrangements.
- *Functioning institutions and governance structures*: The extent of migration is significantly determined by the functionality of the relevant local and national institutions. In countries that lack early warning systems or evacuation plans, extreme weather events cause relatively greater damage and compel more people to flee than is the case in countries that are institutionally well prepared for emergencies. The same applies to the problem of gradual environmental degradation. For example, it has been shown in Section 6.3 that continuing soil degradation can be avoided through efficient land-use technologies and land-use systems.
- *Environmentally induced conflicts*: Migration can also be triggered by environmentally induced conflicts. In this case the link between environmental change and migration is indirect, because the initial consequence of environmental change is conflict. It is only in a second phase that those affected are forced to flee regions that have become violent and politically unstable. At first glance these refugees appear to fall into the category of refugees of war. In fact, however, they belong to the category of environmental migrants, because environmental changes are the cause of their migration. Reference is frequently made in this connection to the example of Rwanda. Some scientists take the view that the genocide of 1994 was only in part a consequence of the politicization of the issue of ethnicity among the groups involved; they see an additional cause in the impoverishment of large sectors of the population as a result of soil erosion and high population density.

**Piguet, E., 2008, 'Climate change and forced migration', UNHCR, Geneva**

[http://www.humansecuritygateway.info/documents/UNHCR\\_climatechangeforcedmigration.pdf](http://www.humansecuritygateway.info/documents/UNHCR_climatechangeforcedmigration.pdf)

This paper finds that environmental degradation can generate migration flows and that global warming could, in particular, lead to major forced displacements. According to the author, this will result principally from rising sea levels, but will only progressively manifest itself over the coming centuries. The increase in droughts and meteorological disasters predicted by climatic models will also have impacts in terms of migrations, but these will remain regional and short term, and are at present difficult to estimate.

Existing research shows that due to the number of factors involved, no climatic or environmental hazards inevitably result in migrations. Many authors note that even if disasters become more

frequent in the future, political efforts and measures of protection will be able to lessen the need to emigrate provided that the necessary financial means are made available. Even rising sea levels could be partially counteracted by the erection of dykes or the filling in of threatened zones.

The paper also warns against the concept of climate or environmental refugees, because it evokes images of uncontrollable waves of migration that run the risk of stoking xenophobic reactions or serving as justification for generalized policies of restriction for people seeking asylum.

In terms of policy responses, the paper puts forward two possibilities:

- An increased international cooperation with a view to collective burden sharing of assistance and prevention in countries confronted with disasters
- The opening of emigration channels with the recognition of environmental push factors in subsidiary international instruments of protection such as temporary protection schemes.

**Sabine L. Perch-Nielsen, Michèle B. Bättig and Dieter Imboden, 2008, 'Exploring the link between climate change and migration', *Climatic Change*, Volume 91, Numbers 3-4 / December <http://www.springerlink.com/content/v2l6k54hk522004u/>**

In this paper, the connection between climate change and migration via two mechanisms, sea level rise and floods, is investigated and depicted in conceptual models. In both cases, a connection can be traced and the linkages are made explicit. However, the study also clearly shows that the connection is by no means deterministic but depends on numerous factors relating to the vulnerability of the people and the region in question.

See also: **GECHS, 2008, 'Climate change and migration', chapter 5.1 (pp 23-24) in *Disaster Risk Reduction, Climate Change Adaptation and Human Security*, A Commissioned Report for the Norwegian Ministry of Foreign Affairs, Global Environmental Change and Human Security, Oslo [http://www.proventionconsortium.org/themes/default/pdfs/GECHS\\_03\\_2008.pdf](http://www.proventionconsortium.org/themes/default/pdfs/GECHS_03_2008.pdf)**

**Kolmannskog, V., 2008, 'Future Floods of Refugees', Norwegian Refugee Council, Oslo [http://www.nrc.no/arch/\\_img/9268480.pdf](http://www.nrc.no/arch/_img/9268480.pdf)**

This report argues that although climate change impacts are likely to contribute to an increase in forced migration, it is one among several root causes. It finds the use of the term "climate refugees" misleading and unhelpful because it is not possible to isolate climate change as a cause of forced migration; the form and scope of migration will depend on mitigation, adaptation and other factors; the term is legally inaccurate; and many of the displaced are likely to be internally displaced.

The report makes the following recommendations:

- Existing law and protection possibilities should be further investigated to identify and address potential protection gaps in climate change-related displacement. An approach similar to the one taken with regard to IDPs, with the creation of the Guiding Principles, could be considered. More research is needed.
- Many of the forced migrants may be included in already existing categories of protected persons, but they may need to be made more visible and recognised within the categories.
- For the internally displaced persons in general there is still a severe protection deficit that must be better addressed.

- When it comes to the island states that risk becoming submerged, some sort of regulation or agreement on a regional or international level should be considered.
- Adaptation in developing countries must be made a top priority along with mitigation. There is a need for a broad approach to adaptation, and resources have to be invested in the whole spectrum of measures contributing to adaptation, including disaster management, humanitarian response and development work.
- Alongside information and infrastructure measures, addressing general factors of conflict and forced migration can also contribute to vulnerability reduction and adaptation.
- Financial resources must also be made available for countries to deal with problems of climate change-related displacement.

**Boano, C., Zetter, R. and Morris T., 2007, 'Environmentally Displaced People: Understanding the Linkages between Environmental Change, Livelihood and Forces Migration.' Refugee Studies Centre, Oxford**

[http://www.reliefweb.int/rw/lib.nsf/db900sid/OCHA-7GMHJF/\\$file/rsc\\_Nov2008.pdf?openelement](http://www.reliefweb.int/rw/lib.nsf/db900sid/OCHA-7GMHJF/$file/rsc_Nov2008.pdf?openelement)

This paper argues that estimates of the global numbers of people who may be displaced vary so widely that they offer an inadequate basis for formulating policies and obscure the enormous regional variations and responses that will occur. In this context, it offers the following recommendations:

Strengthening the knowledge base and harmonising understanding by:

- promoting high-level dialogue in order to develop international understanding of concepts, knowledge-base, vocabulary and experience related to the multiple cause–effect links between environmental degradation, socio-economic impacts and environmentally-induced forced migration;
- promoting the development of more sophisticated typologies of environmentally induced migration;
- generating, collating and disseminating reliable data on the numbers of people migrating because of environmental impacts;
- promoting the identification and mapping of potential environmental 'hotspots', 'tipping points' and migration trends in relation to environmental depletion;
- enhancing knowledge of livelihood resilience, successful adaptation, preparedness and coping strategies used by local populations to mitigate the impacts of environmental change;
- supporting research which will enhance understanding of the relationship between environmental change and conflict;
- commissioning research on potential governance models for areas experiencing degradation and migration pressures.

Fostering institutional reform and enhancing policy responses and competences by:

- advocating the clarification of international institutional responsibilities for promoting and co-ordinating policy responses to environmental change and forced migration;
- developing a comprehensive, accepted and concrete definition of environmental forced migrants, without risk of eroding international refugee law;
- promoting the development of adequate and appropriate protection instruments to safeguard the rights, needs and human security of environmentally displaced populations;
- adopting proactive development policies to address the potential migratory impacts of climate change which stress coping capacities, adaptation and sustainability and which strengthen the incorporation of resilience strategies in programmes and projects;
- recognising that sustainable adaptation measures must be locally and regionally place specific;

- promoting policy responses which mainstream the participation of local partners and community-focused approaches;
- promoting the integration of environmental policies and responses in relief, recovery and development programmes in situations of conflict and forced displacement;
- urging developing countries to integrate the impacts and responses to climate change into Poverty Reduction Strategy Papers and conflict reduction strategies;
- developing principles and practices for 'environment proofing' development strategies, programmes and projects and requiring donors and development agencies urgently to adopt them.

See also: **Adamo, S. B., 2008, 'Addressing Environmentally Induced Population Displacements: A Delicate Task', Background Paper for the Population-Environment Research Network Cyberseminar on Environmentally Induced Population Displacements, 18-29 August** [http://www.populationenvironmentresearch.org/papers/sadamo\\_pern2008.pdf](http://www.populationenvironmentresearch.org/papers/sadamo_pern2008.pdf)

#### 4. Selected case studies

**Meze-Hausken' E., 2000, 'Migration caused by climate change: how vulnerable are people inn dryland areas?', Mitigation and Adaptation Strategies for Global Change, Volume 5, Number 4 / December** <http://www.springerlink.com/content/w8r811240x2r7t31/>

**Mortreux, C. and Barnett, J., 2009, 'Climate change, migration and adaptation in Funafuti, Tuvalu', Global Environmental Change, Volume: 19 Pages: 105-112**  
[http://www.sciencedirect.com/science?\\_ob=ArticleURL&\\_udi=B6VfV-4TY8W69-1&\\_user=128860&\\_rdoc=1&\\_fmt=&\\_orig=search&\\_sort=d&\\_docanchor=&\\_view=c&\\_searchStrId=996976215&\\_rerunOrigin=google&\\_acct=C000010638&\\_version=1&\\_urlVersion=0&\\_userid=128860&md5=2f086fe666e7ece0b8408b2b28635b75](http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B6VfV-4TY8W69-1&_user=128860&_rdoc=1&_fmt=&_orig=search&_sort=d&_docanchor=&_view=c&_searchStrId=996976215&_rerunOrigin=google&_acct=C000010638&_version=1&_urlVersion=0&_userid=128860&md5=2f086fe666e7ece0b8408b2b28635b75)

**RMMRU, 2007, 'Coping with Riverbank Erosion Induced Displacement, Policy Brief, RMMRU, Dhaka** [http://www.rmmru.net/Policy\\_Brief/Policy\\_brief\\_ISSUE\\_1.pdf](http://www.rmmru.net/Policy_Brief/Policy_brief_ISSUE_1.pdf)

**Bradnock R., 2000, 'Sea level rise, subsidence and submergence', in 'Political ecology: science, myth and power, Holder Arnold**  
 Available from BLDS: <http://blds.ids.ac.uk/cf/opacdf/detailed.cfm?RN=218068>

**Henry, S., Schoumaker B. and Beauchemin, C., 2004, 'The Impact of Rainfall on the First Out-Migration: A Multi-level Event-History Analysis in Burkina Faso', Population & Environment, Volume 25, Number 5 / May**  
<http://www.springerlink.com/content/u5564mt67rn28220/>

**Massey, D, Axinn, W. and Ghimire, D., 2007, 'Environmental Change and Out-Migration: Evidence from Nepal', Population Studies Center, University of Michigan**  
<http://www.psc.isr.umich.edu/pubs/pdf/rr07-615.pdf>

#### 5. Recent expert meetings on climate change and migration

Official launch of 'Climate Change, Environment, and Migration Alliance' (CEEMA):  
[http://www.worldwaterforum5.org/fileadmin/WWF5/About\\_Forum/Who\\_is\\_who/Programme\\_Committee/Concluding\\_Session\\_including\\_CEEMA.doc](http://www.worldwaterforum5.org/fileadmin/WWF5/About_Forum/Who_is_who/Programme_Committee/Concluding_Session_including_CEEMA.doc)

Second expert workshop on 'Climate change, environment and migration', Munich, 23-24 July 2009: [http://www.munichre-foundation.org/NR/rdonlyres/997729DA-B698-4255-9DA0-BDBBC670A76E/0/20090806\\_ExpertWorkshopSyllabus\\_web.pdf](http://www.munichre-foundation.org/NR/rdonlyres/997729DA-B698-4255-9DA0-BDBBC670A76E/0/20090806_ExpertWorkshopSyllabus_web.pdf)

'Environmental Change and Migration: Assessing the Evidence and Developing Norms for Response', 2009 conference, Refugee Studies Centre, Oxford:  
<http://www.rsc.ox.ac.uk/PDFs/Environmental%20Change%20and%20Displacement%20Workshop%20Report.pdf>

'The International Conference on Environment, Forced Migration and Social Vulnerability' (EFMSV), 2008, Bonn <http://www.efmsv2008.org/?menu=41>

Expert Seminar: 'Migration and the Environment', 2007, IOM and UNFPA  
[http://www.iom.int/jahia/webdav/site/myjahiasite/shared/shared/mainsite/published\\_docs/serial\\_publications/RB10\\_ENG.pdf](http://www.iom.int/jahia/webdav/site/myjahiasite/shared/shared/mainsite/published_docs/serial_publications/RB10_ENG.pdf)

UNITAR, 2008, 'Climate change, environmental degradation and migration: Preparing for the Future', seminar report, organized jointly with IOM, UNFPA and the MacArthur Foundation 9 May, United Nations Headquarters, New York  
[http://www.migrationdrc.org/publications/resource\\_guides/Migration\\_and\\_Climate\\_Change/UNITAR\\_Summary\\_report\\_9\\_May\\_final.pdf](http://www.migrationdrc.org/publications/resource_guides/Migration_and_Climate_Change/UNITAR_Summary_report_9_May_final.pdf)

## 6. Forthcoming resources

**Hugo, G. et al, 2009, 'Climate Change and Migration in the Asia-Pacific Region', report to the Asian Development Bank, August**

**DFID, 2009, 'Key Sheet on Climate Change and Migration', prepared by the Institute of Development Studies, Brighton**

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