



Science for Environment Policy

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Migration in response to environmental change

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Migration in response to environmental change

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EDITORIAL

Migration and environmental change: examining the relationship

Over coming years, migration flows related to climate change are expected to increase, particularly in the world's poorest countries. This is because climate change is expected to increase the frequency and severity of extreme environmental events, such as drought, sea level rise, floods and hurricanes.

1. Context

These events not only damage infrastructure, homes and the means for livelihoods, but can result, both directly and indirectly, in increased human migration and displacement. For example, severe floods in China in May 2010, and Pakistan in the summer of 2010, were each reported to have displaced over 10 million people.

Although one of the lowest totals ever recorded, in 2014¹ over 12 700 people died or went missing as a result of natural disasters (including earthquakes, hurricanes and other severe weather events) and man-made disasters. In 2014 man-made disasters for example included the failure of a dam in Zimbabwe which resulted in 2000 people losing their homes; and maritime disasters claimed 2 118 victims.

The links between environmental changes and migration are extremely complex. Migration is often the result of a variety of layered causes – economic, social and political – which are accentuated by changing environmental conditions as well as frequently by developmental and demographic conditions. The patterns of movement of environmental migrants can also vary – these may be internal within a country or international; voluntary

or forced; temporary or permanent. Forced migration might result from an environmental catastrophe such as a tsunami or flood, or a government-instigated relocation, while more gradual process of migration could be caused by slow onset environmental deterioration, such as the long-term effects of drought on agriculture experienced in parts of Morocco, Algeria, Tunisia, Somalia and Egypt.

Although not all related to climate change, extreme weather events in 2010 affected over 320 million people – the highest number this century – according to the 2013 World Disasters report² from the International Federation of Red Cross and Red Crescent Societies (IFRC). Torrential rain caused the recent floods in Malawi in January 2015, which resulted in the displacement of more than 330 000 people, according to UNICEF. Although a figure subject to much debate, around 200 million people will be permanently displaced by climate change by 2050, according to the the 2006 Stern Review on the Economics of Climate Change³.

The United Nations Environment Programme (UNEP) anticipates that climate change will affect migration flows in three main ways:

2. *World Disasters Report, 2013, IFRC page 228;*
<http://www.ifrc.org/Global/Documents/Secretariat/201410/WDR%202014.pdf>

3. *Stern, N. 2006 Stern Review on the Economics of Climate Change, HM Treasury, London.*

1. http://media.swissre.com/documents/sigma2_2015_en_final.pdf

firstly the effects of warming in some areas will gradually reduce agricultural productivity and degrade ecosystem services such as clean water and fertile soil. Secondly, the increase in extreme weather events – especially heavy rainfall and resulting flash or river floods in tropical regions – will affect increasing numbers of people, resulting in mass displacement. Thirdly, sea-level rise will permanently destroy extensive low-lying coastal areas – resulting in the permanent relocation of millions of people.

In Europe, environmental migration is already an issue that demands some attention. The EU has recognised that a comprehensive migration policy needs to consider environmentally triggered migration – as in its 2013 Staff Working Document accompanying the EU Adaptation Strategy, '*Climate change, environmental degradation and migration*', and is aware that the impact of earlier European industrial policies seems to have contributed to the speed of environmental changes to come. But what is actually coming?

In its Fifth Assessment Report⁴, the IPCC projects sea level rise of between 26 and 82 cm by 2100 – and the UK Meteorological Office and several European researchers have used a 180-190 cm average rise as the low-probability upper limit by 2100. Under intermediate warming scenarios, most models project that, by 2050, north Africa and the interior of southern Africa will experience rainfall decreases during the growing season that are more than the natural average.

Although one of several scenarios possible by 2100, a two metre sea level rise would inundate large areas of Europe, parts of the northern Mediterranean (Venice), as well as around the North Sea (UK and Netherlands), which would certainly force relocations. A typology of possible policy alternatives for environmentally induced migration is mapped out by the EU's Staff Working Document. These cover prevention, adaptation, resettlement and management of future flows of people. Among these are both prevention of migration and the consideration

of migration itself as an adaptation strategy.

The EU is currently funding the study, Migration, *Environment and Climate Change: Evidence for Policy* (MECLEP)⁵. This research from The International Organisation for Migration, aims to increase knowledge on the relationship between migration and environmental change, including climate change – and on how migration could benefit adaptation strategies for societies.

Since more and more people live in regions and locations highly vulnerable to disasters and other impacts of climate change, planned relocation, together with migration, has an important role to play in future strategies to respond and adapt to such impacts. Accordingly, States may use planned relocation as a potential policy option to protect affected populations. National relocation guidelines are being developed as part of a multi-partner project funded by the European Commission, whose overall aim is to address a legal gap regarding cross-border displacement in the context of disasters. The project brings together the UN High Commissioner for Refugees (UNHCR), the Norwegian Refugee Council/Internal Displacement Monitoring Centre (NRC/IDMC) and the Nansen Initiative⁶.

2. Overview of content

This Thematic Issue presents key pieces of recent research which examine the causes of environmental migration and several evidence-based reports and briefs identifying policy options for Europe in dealing with forced and voluntary relocations. The sources also examine the current state of human rights for environmental migrants and how much evidence currently exists for particular courses of action at local and regional levels.

It is clear that human migration is caused by a complex variety of factors. In '**Exploring interlinked drivers of human migration in the context of environmental change**' researchers examine the main reasons for

4. <http://ipcc.ch/report/ar5/>

5. <https://www.iom.int/meclep>

6. <http://www.unhcr.org/54082cc69.html>

migration and focus on how environmental changes might influence them. The five main factors, outlined by the researchers, which determine whether people stay or go are: economic, social, political, demographic and environmental. Environmental change affects all these main drivers, directly in the case of environmental factors, but also indirectly for the others. The researchers conclude that this framework can be used to help improve knowledge, evaluate policy options, or predict future movements.

The underlying causes and drivers of environmental migration are summarised in '**Extreme environmental events and human migration: no simple link**'. Researchers have reviewed the available evidence on population movements associated with extreme weather events and found that immobility – the so called 'trapped populations' – is an especially relevant policy issue. Vulnerability to extreme events and the ability to move is related to social, economic and political capital. People with low to medium asset levels often become trapped, in their homes during disasters or find that their vulnerability increases where they have been displaced, following a disaster.

Where slow onset environmental change occurs, poor people may become 'trapped' because they cannot diversify their livelihoods, or they do not have the resources and capacity to migrate. The researchers conclude that adaptation strategies and mechanisms ensuring rapid responses would establish clear choices for migrants to return home, adapt, or to move elsewhere.

Migration in the context of climate change, combined with other factors such as war or poverty, is increasing, but not all governments are equipped to deal with the effects of migration on populations. The article, '**Human migration as a result of climate change: how should governments respond?**', summarises a recent policy brief, published by the Institute for Environment and Human Security of the United Nations University, which examines environmental migration and makes policy recommendations. One of the main recommendations is that if environmental conditions are so severe that the state has to

intervene to resettle populations, extreme care must be taken to reduce the negative effects of such a move. The brief also stresses that where relocation takes place this should be a last resort and that it must be planned as part of a sustainable development programme rather than just a temporary measure.

For governments facing environmentally-induced migration, there is a strong evidence base for the value of implementing mobility and adaptation policies, highlighted in the article, '**Migration: an opportunity to integrate human mobility and climate change adaptation policies**'. Based on a UN report, the article emphasises the need for National Adaptation Plans (NAPs) which will help communities affected by climate change-induced hazards to become more resilient. The report stresses that displacement and relocation should be reduced. This could be achieved by strengthening community resilience through, for example, irrigation and water management systems to protect against drought.

Based on a recent book chapter, the article '**Environmental migrants need better human rights protection**' highlights a human rights 'protection gap' for those people forced to migrate by environmental stress and climate change. The international legal status of those displaced by environmental factors is unclear; there is currently no recognition that people displaced for environmental reasons be given refugee status, a situation unlikely to change. The authors focus on five countries which are all highly affected by the impact of climate change: Bangladesh, Ethiopia, Ghana, Kenya and Vietnam, none of which currently offer full legal or normative protection to environmental migrants.

While these countries offer compensation measures for people who lose homes and land through erosion, the researchers found that these tended to benefit larger and more politically powerful landowners. In contrast, the majority of displaced people become marginalised, landless and have no alternative but to move to nearby villages or towns and cities further afield.

The two final articles deal with how environmental migration is affecting the EU. The article, **'Time to act on climate change induced migration'** brings together some recommendations from the 2015 Time to Act: how the EU can lead on climate change and migration report from the Heinrich Böll Foundation. The authors of this think tank report stress that enough knowledge exists to put research evidence into practice and develop suitable policies. They reason that the EU could take a role in leading policy developments to tackle the issue, for example by promoting greater respect for the human rights of migrants and creating safe legal channels for migration.

UK research summarised in the final article, **'EU migration under climate change: impact depends on current infrastructure'** reveals that an increase in floods, land degradation and drought produced by climate change could contribute to further migration within Europe, as well as from neighbouring countries. Good emergency planning and adaptation policies which mitigate the wet and dry extremes of our changing climate will reduce these pressures on migration, the authors say.

Conclusion

Extreme or sudden environmental events and more long-term changes linked to climate change represent what is possibly the most significant future global policy challenge. In the context of increasing climate variability it is clear that adequate adaptation strategies and mechanisms must be developed. Creating these will surely take unprecedented levels of international collaboration and coordination, and need to result in clear choices for migrants. The need for a structured and managed approach is particularly highlighted by the current migration crisis facing the EU.

The research collated here suggests that if policymakers ensure that the concerns of vulnerable social groups are at the centre of migration policy, this, combined with continuing efforts to adapt to environmental change, will help to improve the resilience of affected communities. Inevitably, more research is needed to formulate appropriate policies and programmes, yet it is clear that now, not tomorrow, is the time to prepare the ground.

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Read more about: Sustainable development and policy assessment, Climate change and energy

Exploring interlinked drivers of human migration in the context of environmental change

A framework on the effects of environmental change on human migration has been developed by researchers. It makes clear that environmental change can influence migration directly but also indirectly through impacts on economic, social and political factors. The framework can be used to guide further research, evaluate policy options, or develop predictions for migration under global change.

“There are multiple drivers of migration and rather than trying to identify ‘environmental migrants’, which may be difficult or even impossible, it might be more helpful to examine all drivers of migration and then focus on how environmental changes might influence them.”

There are several global environmental changes which may cause human migration. There are several global environmental changes which may cause human migration. Climate change is, of course, a major factor. Sea level rise, changes in storm or cyclone frequency, changes in rainfall patterns, forest fires, increases in temperature and ocean acidification may result in loss of homes or livelihoods. Apart from climate change, land degradation, in the form of loss of nutrients, soil erosion, pollution and salinisation can also drive changes that lead to migration. Similarly, degradation of coastal and marine ecosystems, as a result of fishing as well as agricultural and urban pollution can impact livelihoods and prompt movements.

Extreme environmental events such as hurricanes, tsunamis, floods and landslides can also cause immediate loss of income and therefore encourage population displacement. However these displacements tend to be at short distance and often within the same state.

However, there are multiple drivers of migration and rather than trying to identify ‘environmental migrants’, which may be difficult or even impossible, it might be more helpful to examine all drivers of migration and then focus on how environmental changes might influence them.

The framework produced for this study does exactly that. On a large scale the researchers identified five main factors which influence people’s decision to stay or go:

1. **Economic**, which includes employment opportunities, income and the price of living.
2. **Social**, which includes the search for educational opportunities or obligations to kin, such as marriage or inheritance practices.
3. **Political**, which includes discrimination or persecution, conflict, levels of security and policy incentives, for example a change in land ownership policy.
4. **Demographic**, which includes population density and structure and risk of disease.
5. **Environmental**, including exposure to hazards and land productivity and habitability.

On a smaller scale personal characteristics such as age, sex, education, wealth or marital status may all have an influence. Furthermore, it should be recognised that none of these drivers occur in isolation from each other. For example, population density is unlikely to drive migration alone, but high densities in combination with low income could well mean that people decide to leave.

Environmental change might affect all these main drivers, directly in the case of environmental factors but also indirectly for the others. For instance, by reducing agricultural or fisheries’ productivity, environmental change can affect economic factors such as income, especially those of rural people. This may occur slowly, during gradual change of rainfall patterns, reducing outputs and incomes over long periods of time — but an event like a cyclone can also result in loss of livelihoods overnight.

Political drivers can also be affected by environmental changes, when, for example, the scarcity of essential resources such as water can precipitate or exacerbate conflict. Policies towards reductions in carbon emissions and eventual decarbonisation may also result in shifts of the locations of areas of economic growth, again influencing people’s decision of whether and where to move.

The researchers say that this framework can be used in a number of ways, helping to improve knowledge, evaluate policy options, or predict future movements. Importantly, it clarifies the interlinked nature of the drivers of migration and how these might be affected by environmental change.

Source: Black, R., Adger, W. N., Arnell, W. N., Arnell, N. W., Dercon, S., Geddes, A. & Thomas, D. (2011). The effect of environmental change on human migration. *Global Environmental Change*. 21S: S3–S11. DOI: 10.1016/j.gloenvcha.2011.10.001.

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Read more about: Sustainable consumption and production, Natural hazards,

Extreme environmental events and human migration: no simple link

While extreme environmental events, such as floods and tsunamis, may trigger migrations, the underlying drivers of migration are far more complex and diverse, says new research. The research reviewed the available evidence on population movements associated with extreme weather events and found that people could find themselves 'trapped' and vulnerable, whether they stayed at their homes or moved to new locations.

“Vulnerability to extreme events and the ability to move is related to wealth (social, economic and political). People of low to medium wealth often become trapped, either in situ during disasters or where they have been displaced, following a disaster.”

Extreme natural disasters such as floods and hurricanes, can cause huge amounts of damage to life, property and economic activity. Large numbers of people have been displaced by recent weather-related disasters, such as floods in central Europe, Brazil, Mozambique, Thailand and Kenya. Widespread floods also affected millions of people in Pakistan and China in 2010.

Over the next 50 years climate change is expected to increase the frequency and severity of extreme environmental events, leading to growing international concern about how to handle their effects.

Forming part of this concern is the belief that extreme environmental events are linked with human migrations and displacement, within and between countries, and that climate change may lead to an increase in corresponding migrations and displacements.

While the relationship between extreme environmental events and migration — such as people fleeing disaster prone areas — may appear simple, there is a growing body of scientific literature questioning this simple relationship.

New research has sought to review the available evidence on population movements associated with weather-related extreme events and examine the underlying causes and drivers of migration.

The authors found that the drivers of migration in response to extreme weather events were multi-causal and complex. While an extreme environmental event could trigger migration, it may be just one of a number of underlying causes, including individual, social, economic and political causes, leading to the decision to move.

For example, almost half of the people displaced in Indonesia and Sri Lanka following the 2007 Indonesian Tsunami were unable to return to their homes. This was partly due to the nature of the forcible relocations into ‘camps’ created to house them, and partly due to the creation of a coastal ‘exclusion zone’ intended to prevent return to an area now considered vulnerable to natural disasters.

Immobility was found to be an especially relevant policy issue for migration. Vulnerability to extreme events and the ability to move is related to wealth (social, economic and political). People of low to medium wealth often become trapped, either in situ during disasters or where they have been displaced, following a disaster. Their vulnerability means they are unable to move for financial, political or social reasons, while those of greater wealth are much more resilient and better able to move.

The authors suggest that putting the concerns of vulnerable populations at the centre of development policy and improving adaptation to environmental change will help improve resilience in disaster risk reduction policies. However, they also caution that policymakers must be careful when they seek to reduce the vulnerability of populations in situ as this can be seen as a policy of ‘containment’, and risks leaving people trapped in conditions where they may be even more vulnerable if protection measures fail.

The authors conclude that extreme environmental events are likely to remain a significant policy challenge in the future. In the context of climate change and a future increase in extreme events, adequate adaptation strategies and mechanisms must be put in place to ensure rapid responses with clear choices for those displaced to return home or to move elsewhere. The existence of these choices may, the authors say, determine whether future policy will be needed to give legal protection to displaced people.

Source: Black, R., Arnell, N. W., Adger, W. N., Thomas, D. & Geddes, T. (2012). Migration, immobility and displacement outcomes following extreme events. *Environmental Science and Policy*, 27, S32–S43. DOI:10.1016/j.envsci.2012.09.001

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Read more about: [Climate change, Sustainable development and policy assessment](#)

Human migration as a result of climate change: how should governments respond?

Human migration as a result of climate change is now a reality. People across Africa, Asia and Latin America are moving in response to unpredictable rainfall patterns. The governments of Bangladesh, Papua New Guinea and small island states, such as the Solomon Islands, have already had to resettle people because of rising seas. A recent policy brief, published by the Institute for Environment and Human Security of the United Nations University, examines this issue and makes recommendations for policy

“...it is vital that states do not wait until migration has begun before making provisions for access to housing, land and property for people displaced by climate change”

The authors explored different facets of human movements as a result of climate change. They discuss the importance of recognising that these movements can be internal within a country or international; voluntary or forced; and either temporary or permanent. They can be the result of displacement, migration or planned relocation. Importantly, the needs of affected people can vary across all of these categories.

Such movements occur in response to several different impacts of climate change. Rising sea levels, desertification or permafrost melt may render some areas uninhabitable. Increased frequency of storms, floods, cyclones and heat-waves may force people to relocate, sometimes in the long term. Changes to regional weather systems may reduce access to essential resources such as water, as well as affecting livelihoods, especially fishing and farming. Finally, these impacts, either in isolation or combined, may result in conflict, again displacing people.

Research as part of the EU-funded EACH-FOR1 project examined 22 case studies in six regions of the world to demonstrate that rapidly changing environmental conditions are now driving changes to migration patterns. Another project, focusing on refugees from Ethiopia and Uganda found that worsening weather patterns caused resource scarcity, exacerbating pre-existing conflicts. In addition, these conflicts severely affected the refugees' abilities to deal with climate-related stresses.

Research in Africa, Asia and Latin America² revealed that seasonal, temporary and even permanent migration is already being used to manage risks associated with rainfall variability and food insecurity, which are both worsening under climate change. Most migration is within national borders, the researchers found, and the majority of migrants are men, although the number of women is rising.

The policy brief emphasises the need to distinguish between resilient and vulnerable groups of people, both of which might migrate in response to climate change. Resilient people (those which tend to have more assets, education and access to adaptation strategies) use voluntary migration as a way of enhancing their resilience. This might involve a move to a non-agricultural job in the city, for example. Conversely, vulnerable people have fewer assets and may be forced to move for survival, in search of food, or work to buy food.

The brief's authors recommend that, where possible, policy should support a transition toward livelihoods that are not climate dependent. Particular focus should be given to those that are vulnerable to the impacts of climate change. For example, these individuals should be prioritised by national schemes for improved education or vocational training. Indeed, it is vital that states do not wait until migration has begun before making provisions for access to housing, land and property for people displaced by climate change. If conditions worsen to the point where the state must intervene to relocate populations, extreme care must be taken to reduce the negative effects of such a move. The brief highlights some key recommendations.

First, they assert, any forced relocation — where realistic options to choose from are no longer available — must be an absolute last resort. Second, planning is essential and any scheme should be part of a new sustainable development programme rather than a temporary measure. Third, it is vital that people to be moved are consulted on how the process could be best designed to work for them. Finally, the process does not end once people have moved. In their new homes they should be supported to restore and improve their livelihoods and incomes.

Policy should be designed to foster understanding and co-operation on this subject between neighbouring countries. While there is as yet no recognition that climate-displaced people be given refugee status, the human rights of climate-displaced people must be recognised. The brief concludes that more information on the complex impacts of migration and displacement is vital to create effective policy agreements for the future.

Source: Warner, K., Afifi, T., Kälin, W., Leckie, S., Ferris, B., Martin, S. F. & Wrathall, D. (2013). *Changing Climate, Moving People: Framing Migration, Displacement and Planned Relocation*. Policy Brief No. 8. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS). <https://collections.unu.edu/eserv/UNU:1837/pdf11213.pdf>

1. Environmental Changes and Forced Migration Scenarios (EACH-FOR) was supported by the European Commission under the Sixth Framework Programme. See: <http://www.ccema-portal.org/article/read/each-for-project-publications>.

2. Warner, K., *et al.* (2012). *Where the Rain Falls: Climate Change, Food and Livelihood Security, and Migration*. Global Policy Report of the Where the Rain Falls Project.

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Read more about: Climate change and energy, Sustainable development and policy assessment

Migration: an opportunity to integrate human mobility and climate change adaptation policies

The migration, displacement and relocation of people needs to be properly addressed in climate change adaptation plans, says a UN report. Among the report's recommendations, National Adaptation Plans (NAPs) should ensure that communities affected by climate change-induced hazards, such as flooding and drought, are more resilient. Migration can also be seen as an adaptation strategy in itself.

"The report highlights the importance of a strong evidence base for mobility and adaptation policies... Evidence should also come from consultations with affected communities..."

Climate change's effects can lead to large-scale movement of people, within and between countries. It can occur when communities lose habitat and agricultural livelihoods to rising sea levels, floods, drought and other environmental hazards. This movement is already taking place in some areas around the world.

The report considers how to link human mobility issues with National Adaptation Plans (NAPs) to improve adaptation and mobility policies. NAPs are being created by the least developed countries that are party to the UNFCCC's Cancun Adaptation Framework. The EU and its Member States help fund and support adaptation efforts in developing countries, and provided €7.34 billion to 'fast-start finance' in 2010–2012.

Different types of mobility require different types of policy. As well as international migration, the report addresses displacement and planned relocation. Displacement occurs when people are forced to move within their countries, as well as abroad, to flee local disasters. Planned relocation is overseen by authorities and refers to the process of moving people out of disaster-affected areas.

Migration can be seen as both an opportunity and a challenge, the report says. It is important to reduce the pressures of migration, and participants involved in consultations in the Pacific region (as part of the Nansen Initiative) have emphasised that moving from their homes is a last resort and that they strongly support climate change mitigation efforts.

However, where migration does occur, it can have some positive effects. For example, voluntary migration from the central Pacific island nation of Kiribati has enabled migrants to send money home that strengthens the resilience of their community to climate change.

Movement can also place migrants in vulnerable situations, however. Kiribati's government has therefore included training (e.g. in nursing, teaching and the English language), as well as cultural acclimatisation training, for citizens as part of its 'migration with dignity' plans. These skills will help Kiribati's citizens settle abroad, and provide opportunities for adaptation when mitigation is no longer possible.

Displacement and relocation should be reduced, according to the report. This can be achieved by strengthening community resilience through, for example, irrigation and water management systems to protect against drought, and by enhancing food security and livelihoods. Early warning systems for hazards, shared environmental resources and measures to reduce conflict between communities could also be considered in NAPs. Such measures may help reduce the kind of displacement seen in the Greater Horn of Africa, where hundreds of thousands of people were forced to move within or from Somalia during 2010–2011 droughts.

The report highlights the importance of a strong evidence base for mobility and adaptation policies. This can be developed by looking at existing research and projects, such as the EU-funded project to help Pacific island countries manage the impacts of climate change on migration. Evidence should also come from consultations with affected communities, to take local knowledge into account.

Source: Warner, K., Kälén, W., Martin, S., Nassef, Y., Lee, S., Melde, S., Entwisle Chapuisat, H., Franck, M. & Afifi, T. (2014). Integrating Human Mobility Issues within National Adaptation Plans. Policy Brief No. 9. Bonn: United Nations University Institute for Environment and Human Security (UNU-EHS). Available from: <http://collections.unu.edu/eserv/UNU:1838/pdf11800.pdf>

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Read more about: Natural hazards, Sustainable development and policy assessment

Environmental migrants need better human rights protection

A human rights 'protection gap' exists for people forced to migrate by environmental stress and climate change, according to researchers. The lack of a legal framework and practices to protect 'environmental refugees' stems from the historic and political context of migration issues and land access rights more broadly, the researchers say in a recently published paper.

"...it is not just material rights, such as shelter and sanitation, which are important for migrants. Political rights are very important too – such as the opportunity for migrants to contribute to decisions about resettlement schemes."

There are a number of possible arguments and reasons for why populations displaced by floods, droughts and other environmental hazards do not have the same legal protection as other types of migrants, such as refugees fleeing war (protected through the UN's Geneva Convention relating to the status of refugees, among other instruments).

For instance, it may be more challenging to define the migration as 'forced' or to define the category of affected people. There is also the question of who should take responsibility to ensure migrants are safe, treated with dignity and empowered, and how this responsibility should be managed. Should countries that emit high levels of CO₂ be responsible, for example, and should the migration be dealt with through a short-term humanitarian response to disaster?

This paper, a chapter in a 2014 book, argues that environmental stress-induced migration and displacement is best explained by historical and political factors. It reaches this conclusion by analysing the cases of five countries which are all highly vulnerable to climate change's impacts: Bangladesh, Ethiopia, Ghana, Kenya and Vietnam. None offer legal protection to environmental migrants.

Migration, more generally, is a highly sensitive issue in these countries. For instance, in Kenya, where land is the main source of livelihoods, there is ongoing use of eviction (i.e. forced migration) and displacement as tools for politically excluding communities, claiming power and accessing resources, the paper's authors say. These conditions, which stem from Kenya's colonial history, underlie many recent instances of violence and conflict in the country. Until such complex dynamics of wider migration and land rights issues are resolved, the authors assert that a rights-protection gap for Kenya's environmental migrants will remain.

Similarly, Bangladesh has a very politically charged, recent history of migration. Huge population movements following the 1947 partition of India and Pakistan left a legacy of 'political, social and cultural trauma', the authors state. Such traumatic associations mean that 'displacement' and 'displaced people', and the rights of displaced people, are not yet explicitly recognised in national legal and political frameworks.

The authors include a case study of how rights are not protected for people forced to move by 'silent and incremental' river bank erosion in Bangladesh. This environmental problem is thought to displace one million people every year. There are compensation measures for people who lose homes and land through erosion, but these tend only to benefit larger and more politically powerful landowners, a phenomenon perhaps linked to the lack of transparency. The authors assert that, in contrast, the majority of displaced people become increasingly marginalised and impoverished, and either become landless labourers in nearby villages or move to towns and cities.

The paper also points out that, in the five countries considered, migration due to climate change is seen as a future challenge and takes less priority than more immediate developmental and poverty reduction goals. However, it also posits that these countries' still-fragile governing bodies have a general reluctance to address human rights issues.

It also argues that it is not just material rights, such as shelter and sanitation, which are important for migrants. Political rights are very important too — such as the opportunity for migrants to contribute to decisions about resettlement schemes.

Source: Zetter, R. & Morrissey, J. (2014) Environmental Stress, Displacement and the Challenge of Rights Protection. In: Martin S., Weerasinghe, S., and Taylor, A., (eds) *Humanitarian Crises and Migration: Causes, Consequences and Responses*. London: Routledge. Ch. 9.

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Time to act on climate change induced migration

A recent report presents a series of recommendations for how the EU could address the complex issue of climate change-induced migration. There is now sufficient evidence to show that environment-related migration is occurring, and the time is right to put recommendations into practice, the report's authors argue.

“The report highlights the fact that the vast majority of the world’s climate-induced refugee population currently stay within their home regions – and a lack of adaptive capacity will put increasing pressure on their homelands....”

Climate change has important implications for migration; for example, drought can degrade livelihoods and weaken people’s ability to cope with poverty and conflict. The report highlights the fact that the vast majority of the world’s climate-induced refugee population currently stay within their home regions – and therefore the combination of population growth, the increase in the quantity and intensity of extreme environmental events and a lack of adaptive capacity will put increasing pressure on their homelands.

The EU has recognised the problem of climate change related migration. For example, its 2013 document ‘Climate change, environmental degradation and migration’ highlights the need for further analysis and says a comprehensive migration policy should consider environmentally triggered migration. The EU has also funded a number of research projects to improve our understanding of the issue.

The new think tank report says that the time has now come to put research evidence into practice and develop suitable policies. A holistic policy approach is needed to tackle the multi-dimensional nature of human movement in response to environmental degradation, it reasons.

It is difficult to develop well-designed policies that address this challenge because the links between climate change and migration are very complex. Furthermore, there is currently no legal definition of an ‘environment-related migrant’. The issue is further complicated by unresolved questions of who is accountable and financially liable for climate-change-triggered migration.

However, complexity is not a reason to avoid tackling this issue, the report argues. It is also unlikely that large numbers of people will permanently move to Europe solely for climate-related reasons.

Women are seen as especially vulnerable to climate change’s effects in many countries, because a lack of resources, education and decision-making powers, among other reasons, can restrict their mobility. However, the authors also make the point that some forms of migration reduce vulnerability. For example, there is evidence that some farmers in climate-stressed countries move to cities during periods of water shortage to find temporary work. The report’s authors believe that the EU should take a leading role in addressing the phenomenon. They recommend that EU funding streams should create mechanisms for people to move from vulnerable areas and EU policies relating to environmental migration should give vulnerable groups special consideration.

The authors also recommend that language is considered carefully in institutional communication dealing with migration, as choice of words can express an opinion. For instance, calling someone an ‘immigrant’ or an ‘emigrant’ or a ‘climate refugee’ all have different implications, and may either reinforce or deconstruct negative stereotypes about migrants.

The authors emphasise that it is sensible to focus on preventing displacement in the first place. However, this should not be the sole focus of migration policy, which should also consider sharing the responsibility of migration in affected regions.

Source: Ammer, M., Mayrhofer, M, Randall, A. & Salisbury, J. (2014) *TIME TO ACT - How the EU Can Lead on Climate Change and Migration*. Brussels: Heinrich-Böll-Stiftung. Available from: <http://eu.boell.org/en/2014/06/12/time-act-how-eu-can-lead-climate-change-and-migration>

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EU migration under environmental change: impact depends on current infrastructure

In the future, environmental changes such as an increase in floods, land degradation and drought could result in changes in migration patterns in Europe, researchers write in a recent analysis. It is difficult to predict these exact migration patterns, however, as they are determined by a complex interplay of economic, political and social factors with environmental change, as well as adaptive capacity.

“Environmental change, such as an increase in flooding and drought, is inevitable in Europe and beyond, which is likely to increase pressures on people to move away from more hazard-prone and degraded areas, particularly from south to north, from south to east and from rural to urban areas.”

Environmental factors already influence population movement in Europe. For example, desertification in northern Africa is partly behind a recent increase in migration from the region to the European Mediterranean. The only recent displacement of people to Europe from natural environmental causes was from Montserrat in the West Indies, after the volcanic eruption that started in July 1995, which devastated much of the island. Also, many Europeans seeking better quality of life may move to other parts of the continent with a more agreeable climate; tourism in such areas would be expected to increase.

The analysis by UK researchers considers the potential impacts of environmental change on migration both within Europe and to Europe from neighbouring Mediterranean countries in northern Africa and the Middle East.

Economic, political, social and cultural factors are the main drivers of migration. However, they cannot be considered in isolation of each other and can be influenced by environmental factors. For example, the desertification in northern Africa has exacerbated poverty and contributed to the population movement. This complexity of drivers does make it difficult to predict the exact effects of the environment on migration.

Environmentally forced migration is currently rare in Europe, but there is a possibility that environmental change will play a bigger role in human movement in the future. Climate change will bring an increased risk of hazards, such as flooding and water shortages, in and around Europe.

The analysis highlights hazards in northern Africa and the Middle East which may indirectly, and in conjunction with other factors, increase migration levels into Europe. For example, dryland cropping agricultural techniques in Morocco, Algeria, Tunisia and Egypt are very vulnerable to the effects of drought. A 1-metre rise in sea levels would have a major impact on populations in the southern Mediterranean around the Nile delta, affecting around 6 million people and causing the loss of 10% of arable land.

Although people in less developed countries are most vulnerable to environmental degradation, Europe has some vulnerabilities too. These could increase pressures on population movement. For instance, there is significant risk of flooding around the North Sea, despite flood defences being in place. Increased rainfall and snowmelt in future will increase this risk. Furthermore, a catastrophic 2m sea level rise would inundate large areas of Europe, in parts of the northern Mediterranean (Venice), as well as around the North Sea (UK and Netherlands). This could force populations to move from large areas in these countries.

Environmental change, such as an increase in flooding and drought, is inevitable in Europe and beyond, which is likely to increase pressures on people to move away from more hazard-prone and degraded areas, particularly from south to north, from south to east and from rural to urban areas. The analysis also comments that highly urbanised and developed parts of northern Europe could actually be the most vulnerable to climate change's impacts, owing to their dense populations and infrastructure.

However, good emergency planning and adaptation policies which mitigate the wet and dry extremes of our changing climate will reduce these pressures on migration, the authors say. They note that more significant investments in the northern Mediterranean and northern Europe, than in the southern Mediterranean and southern Europe. They also note that, although the wealthier northern countries may seem more adaptable, these areas also host the greatest populations and intensive agriculture near the limits of water sustainability, so may actually be more vulnerable to loss of ecosystem services and increased climate change hazards.

Source: Mulligan, M., Burke, S. & Douglas, C. (2014). Environmental Change and Migration Between Europe and Its Neighbours, in *People on the Move in a Changing Climate* (pp. 49-79). Springer, Netherlands.

Further Reading

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News Alert articles

Mediterranean countries use more natural resources than their ecosystems provide

In the Mediterranean region the demand for natural resources and ecological services is two and half times greater than ecosystems' capacity to provide them, recent research has found. To meet this demand, countries rely on imports, exposing themselves to price volatility and potential resource shortages. According to the authors, a 10% increase in global prices would particularly impact vulnerable countries such as Jordan, which would see its trade balance worsening by 2.4% of its gross domestic product.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/mediterranean_countries_use_more_natural_resources_than_their_ecosystems_provide_426na1_en.pdf

Mediterranean land degradation threatens food security

Climate change, tourism and population growth are all accelerating land degradation in the Mediterranean region, according to recent research. This can have severe impacts: the amount of available agricultural land per capita in the region could have dropped by half by 2020, compared with 1961, the study estimates.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/mediterranean_land_degradation_threatens_food_security_391na6_en.pdf

El Niño Southern Oscillation can be used to predict global flood risk anomalies

Unusually warm or cool Pacific sea surface temperatures, known as El Niño and La Niña, can be used to reliably predict anomalies in flood risk for river basins that cover 44% of the Earth's land surface, a new study has shown. The researchers also quantified overall flood damage by combining information on flood risk with estimates of damage to economies and numbers of people at risk. This could help improve flood disaster planning, they say.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/El_Nino_southern_oscillation_used_to_predict_global_flood_anomalies_400na3_en.pdf

Climate change to shift global spread and quality of agricultural land

In a recent report, German researchers have reviewed scientific evidence of the likely consequences of climate change. They highlight that, in addition to the risks for biodiversity, climate change is also predicted to increase security risks between countries. They suggest that the European Union should reinforce its position, especially within the context of the Kyoto Protocol and should support developing countries.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/climate_change_to_shift_global_spread_quality_agricultural_land_403na1_en.pdf

Climate change and security risks

International trade in wood and wood products affects forest stocks around the world. A recent study examines the relationship between changes in forest cover and international timber trade at global level. It finds that some wealthier nations with low population density can maintain forest areas while exporting wood; but other, usually poorer, nations, are losing forests through domestic and global demand for wood.

<http://ec.europa.eu/environment/integration/research/newsalert/pdf/263na2.pdf>

To view any of these in full, please visit: <http://ec.europa.eu/science-environment-policy>, and search according to publication date.

Thematic Issues

Flooding (June 2013)

Flooding can cause profound and lasting effects on people, business and agriculture. This Thematic Issue brings together recent research that provides insight into changes in European flood risk policy, that could help policymakers deal with the projected increases in flood risk.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/40si_en.pdf

Resource Efficiency (May 2011)

Humanity is demanding ever greater economic productivity at a time when natural resources, the input that feeds this productivity, are dwindling. To reduce pressure on key assets, such as water, minerals, fuel and land, we must use less of them, and we need to increase the efficiency and productivity of resources that we do use, to achieve more output per input. Put simply, we must do more with less. This Thematic Issue reports on research which helps guide the way to a more resource efficient society.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/26si_en.pdf

Future Briefs

Public risk perception and environmental policy (October 2014)

How does the public perceive environmental risk? What are the pitfalls of communicating uncertainty? Understanding why over- or under-estimations occur is essential to finding the right policy balance.

http://ec.europa.eu/environment/integration/research/newsalert/pdf/public_risk_perception_environmental_policy_FB8_en.pdf

Future Briefs are a feature of the service, introduced in 2011, which provide expert forecasts of environmental policy issues on the horizon. In addition to Future Briefs, Science for Environment Policy also publishes a weekly **News Alert** which is delivered by email to subscribers and provides accessible summaries of key scientific studies.

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