Environmentally Induced Migration and Sustainable Development

Background Paper

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Background Paper: Environmentally Induced Migration and Sustainable Development

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Executive Summary

The impact of environmentally induced migration (EIM) on sustainable development and the achievement of the Millennium Development Goals is an emerging and relatively unexplored issue. This paper analyses the nexus between environmental change and migration from the angle of sustainable development at regional, national and international levels, with focus on migration induced by slow-onset environmental degradation and exacerbated by climate change. EIM is a complex and interdisciplinary issue; sustainable development can be an effective and comprehensive way to deal with it through slowing down environmental degradation, adaptation to climate change, food security, water availability, conservation of biodiversity, reduction of vulnerability, sustainable management of natural resources, early warning systems and risk management.

In the first part, the authors review the science of EIM. Conceptually, the environment can lead to population movement in two main ways: on one hand, through natural hazards, such as floods, earthquakes, cyclones, tsunamis, tornados, wildfires and other natural disasters that suddenly force people to move; and on the other hand, through slow-onset environmental changes, such as soil degradation and erosion; deforestation; desertification; water, soil and air pollution; water-logging and salinization of irrigated lands; landslides and mudslides; radiation from nuclear waste; saltwater intrusion and accelerated coastal erosion; riverbank erosion; extreme aridity and irregular rainfall; and sea level rise.

In the second part, the authors analyze the connections between EIM and sustainable development, through its interrelated economic, social and environmental pillars, with a focus on slow-onset environmental changes and on the most vulnerable sending and receiving regions. Three case studies are reviewed: Bangladesh, one of the most exposed countries to climate change and EIM; Tuvalu, a widely cited example of Small Island Developing State (SIDS) whose population is threatened by sea-level rise; and the Himalaya that has been at the heart of the recent discussions on the impact of climate change.

The third part addresses the relative policy implications, exploring the adaptation and other policy options and recommends policies and actions for the policymakers. Economic diversification should be pursued in countries that rely on agricultural production and that might be threatened by soil erosion, land degradation, desertification and other factors threatening the efficiency of the agricultural system; the same holds for countries primarily relying on fishing and cattle herding. Adaptation strategies that allow potential migrants to remain in their home community - if they choose so - should be the priority; EIM should only be used as an adaptation strategy when it is not possible for the migrants to stay. Sending and receiving regions should work together to conserve biodiversity and to avoid the cultural loss related to the abandonment of the origin countries.

A stronger scientific basis and a more appropriate data collection would help policymakers design appropriate policies for EIM; these policies should take into consideration the needs of the most vulnerable and they should be adequately funded at all levels. Policy coherence is needed both at the horizontal and vertical level. Moreover,
an effective legal system and a participatory process would help guarantee security, especially in the receiving regions.

The lack of clarity about the interrelation between the environment and other stress factors, especially poverty and security, hinders its inclusion into development strategies. Environmental factors should not be singled out when studying the migration decision; on the contrary, they should always be studied in connection with other socio-economic factors.

National, regional and local governments, with the support from the United Nations (UN) and International Institutions, can promote international dialogue and implement effective policies to deal with EIM and find an agreed upon legal framework for both internal and international environmentally induced migration.

More case studies are needed to draw lessons for the future and to better understand the policy implications of EIM.
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Introduction

The impact of environmentally induced migration (EIM) on sustainable development and on the achievement of the Millennium Development Goals (MDGs) is still an emerging and relatively unexplored issue.

In the last years, migration induced by natural hazards has received a lot of attention both from the media and the political world. In the short-term, the main challenge related to displacement caused by natural disasters is humanitarian; in the long-term, policy makers have to guarantee a sustainable future to the populations affected.

At the same time, millions of people are displaced by slow-onset environmental degradation. The decision to migrate in response to environmental change is very complex and studying it from a sustainable development perspective helps understand the way in which environmental push factors interact with other economic, social and political variables.

This paper analyses the nexus between environment change and migration at national, regional and international levels with focus on migration induced by environmental degradation and exacerbated by climate change.

In the first part, the authors analyze the theoretical debate on EIM and draw important lessons from the Environmental Change and Forced Migration Scenarios (EACH-FOR) Project, the most comprehensive study on EIM up to date.

In the second part, the authors emphasize that not enough attention is paid to the negative effects of EIM on the sending regions. They analyze the EIM-sustainable development nexus through its three strongly interrelated economic, social and environmental pillars. Moreover, they investigate the role of EIM in meeting the MDGs in vulnerable countries, mainly the poorest in the world.

The third part of the paper addresses the relative policy implications, exploring the adaptation and other policy options and recommends policies and actions for the policymakers. The authors stress out the need for economic diversification and, in the case of international EIM, the importance of policies to keep skilled labor in developing countries and improving international cooperation.

The study emphasizes the necessity of including EIM in the National Sustainable Development Strategies (NSDS), National Adaptation Action Plans (NAPAs), Poverty Reduction Strategy Papers (PRSPs) and other relevant development plans of the various countries. Among others, the study concludes that early planned population movements can be beneficial for sending and receiving regions, while sudden forced migration is usually not.
Section 1 – Scientific research on EIM

“Environmental migrants are persons or groups of persons who, for compelling reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad” - IOM’s Working Definition

As early as 1990, the Intergovernmental Panel on Climate Change (IPCC) warned that the greatest single impact of climate change could be on human migration. Conceptually, there are different ways where environment can lead to population movements:

1. **Long-term EIM**: either voluntary or involuntary. There are two ways in which slow-onset environmental changes lead to migration:
   a. **Direct EIM**: migration in response to sea-level rise, drought, desertification and other environmental stressors, directly identifiable as the main reason behind the migration decision. These environmental stressors are often caused or exacerbated by climate change and increased climate variability and are likely to reflect an unsustainable model of development.
   b. **Indirect EIM**: environmental factors playing an important role but not the main reason for migrating. In this case, it is complicated to weigh the importance of environmental factors in the migration decision that is seldom completely voluntary or involuntary. A sustainable development approach is needed to study the connections between economic, social and environmental push factors for migration.

2. **Short-term (emergency) EIM**: forced migration caused by floods, earthquakes, cyclones, tsunamis, tornados, wildfires and other natural hazards. Worldwide, the number of these events has doubled in the last two decades; the IPCC AR4 has stressed the fact that the likely increase in the number of natural hazards during the 21st century will increase the potential for this kind of population migration to take place.

A similar definition tree was introduced by Renaud et al. (2010) and classifies ‘environmentally induced migrants’ as follows: Environmental

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2 IPCC (2007): Fourth Assessment Report (AR) on Climate Change by the IPCC Working Group II
Emergency Migrants who flee the worst of an environmental impact to save their lives, Environmentally Forced Migrants who have to leave to avoid inevitable and grave consequences of environmental degradation, and Environmentally Motivated Migrants who may leave a steadily deteriorating environment to pre-empt the worst. The term ‘Environmental Emergency Migrants’ is meant to replace the term Environmental Refugees that is alarming of nature and could be perceived at the expenses of ‘Political Refugees’ who might be subject to persecution, torture or even killing.

According to the Office of the United Nations High Commissioner for Refugees (UNHCR), in 2002, there were approximately 24 million environmental migrants, defined as “people who have fled because of floods, famine and other environmental disasters”\(^5\). Forecasts on the number of potential environmental migrants by 2050 vary from 50 million to 350 million; the most cited estimate is the one given by Myers, who predicted 200 million potential environmental migrants by 2050\(^6\). While IPCC expects the number to reach 150 million by the year 2050\(^7\), the *Almeria Statement* (1994) estimates 135 million people to be negatively affected by desertification and droughts\(^8\). The *Stern Review* (2006) predicts that there will likely be 200 million environmental displaced people by 2050\(^9\); Nicholls (2004) expects the same number by 2080\(^10\). On the regional level, UNEP expects in Africa alone 50 million environmental migrants by 2060\(^11\).

However, according to the IPCC AR 4, there are five main reasons why estimates of the number of people who may become environmental migrants in the future are only guesswork:

1. The multi-directional and often temporary or episodic nature of migration;
2. The multiplicity and complexity of the decision to migrate;
3. The unreliability of censuses and surveys on which such estimates are based;
4. The lack of an agreed definition of environmental migrants;
5. Migration is sometimes a strategy to accumulate wealth rather than a response to environmental hazards;

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\(^7\) IPCC (2007): Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, Climate Change Impacts, Adaptation, Vulnerability (Summary for Policymakers, IPCC WGII Fourth Assessment Report).
\(^10\) Nicholls, R. J. (2004): Coastal flooding and wetland loss in the 21st century: changes under the SRES climate and socioeconomic scenarios, Global Environmental Change.
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Two more reasons can be added to the list: on one hand, the evolution of climate change and its impact on human settlements is still uncertain; on the other hand, these are estimates of potential migrants and not of people that will actually migrate. In fact, the number of migrants by 2050 depends on many factors that are unpredictable in the long term, including information available to the potential migrants and the economic, social and political conditions in the next four decades.

In the migration literature, there are two main perspectives on EIM:

1. **The “minimalists”** believe that the environment should just be seen as a contextual factor in the decision to migrate, because - most of the times - people move for economic, social and political reasons.
2. **The “maximalists”**, by contrast, highlight migration as a direct result of environmental factors. These authors believe that it is the insecurity directly caused by environmental factors that displaces people and pushes them to move.

The Fourth Assessment Report on Climate Change by the IPCC Working Group II (2007) has taken a minimalist approach to EIM and highlighted that it is very complicated to disaggregate the reasons for migration and to single out EIM. It also suggested caution in the prediction of conflicts as a result of climate change, because conflicts arise for many interrelated reasons.\(^\text{12}\)

EIM as a concept has developed throughout the 1990s; in the Earth Summit of Rio de Janeiro (1992), the issue of environmental migration was not mentioned, and in the Law of Nations, the number of environmental migrants is unknown. As for the 1951 Geneva Convention for Refugees, environmental damage is not considered a factor leading to refuge; people who are included in the frame of the Convention and are regarded as refugees are those who are prosecuted and forced to leave their habitat due to their race, religion, political views, etc. but not due to environmental damage. Moreover, a person is not considered a refugee according to the Convention if (s)he stays within the same country. Hence, the numerous people who might change their village/region due to environmental degradation without crossing the borders cannot be granted protection under the Convention.

Traditionally, EIM has been conceptualized in three main ways; in economic terms (through the New Economics of Labor Migration approach); in a broader framework, including social and cultural capital (through the Sustainable Livelihoods Approach); and with an agent based modeling.\(^\text{13}\) A very innovative approach is the one adopted by Afifi and Warner (2008) who were the first researchers to include environmental variables (in addition to different economic, political, social, historical and cultural indicators) in a gravity model and relate all these factors to migration. They found out that the environment has a positive significant impact on the migration flows across countries.\(^\text{14}\)

The push-pull factors approach to migration helps clarifying the factors that intervene in the decision to migrate in response to environmental stressors: push factors (from origin


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regions) include natural disasters, gradual climate-driven environmental changes and armed conflicts over shrinking natural resources while pull factors (from destination regions) include better economic opportunities, better ecosystems and networks in the destination regions. It is obvious that the pull factors are very often economic (e.g. higher income and better standard of living) rather than environmental.

Several non-climate factors influence EIM, such as overpopulated settlements, security issues, overuse of natural resources, deforestation, economic structures and production techniques etc.\(^{15,16}\). Poverty in the origin countries might be a push factor too, as far as potential migrants have enough financial means to migrate, if they are willing to; the case of Mali during the drought in 1983-1985, for example, shows that in spite of a severe drought, there might be no increase in the number of migrants.\(^{17}\) Intervening factors also include immigration/registration policies, transport infrastructures and information available to potential migrants.

Stal and Warner (2009)\(^{18}\) highlight the importance of identifying the timing and duration of EIM and its geographic dimension, in order to design appropriate policy recommendations. Migration can either be temporary or permanent and migrants often do not know whether they will have the chance to go back to their origin countries. Moreover, migration can either involve households or single members of the households. Most of the EIM so far has taken place from environmental hot spots to better places within the same country, namely from rural to both rural and urban areas. The internal dimension of EIM makes it harder to find numbers about it, because countries, for political and strategic reasons, are always interested in monitoring and documenting international rather than internal population movements.

Poverty and insecurity that induce migration are often interrelated with environmental factors that push people to move. In the case of poverty, the economic distress that pushes people to move in search of higher income, better standard of living and more job opportunities can be indirectly caused or exacerbated by climate change and environmental degradation (long term indirect EIM). There is no agreement on whether these people should be defined as environmental migrants, since it is very complicated to weigh the relative importance of different drivers of migration.

The recent Report of the Secretary General (SG) of the United Nations on “Climate Change and its possible security implications” defines migration as one of the channels through which climate change works as a threat multiplier, exacerbating economic, political and social threats to security. Moreover, the IPCC AR4 highlights the severity of

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the consequences of sea-level rise, the increase in extreme weather events and in droughts on population displacement.\textsuperscript{19}

EIM is often seen as a failure of sustainable development. However, some authors emphasize that global warming will actually help some regions getting richer; EIM can be a positive adaptive and a risk diversification strategy within households. The number of academic and policy publications about EIM has increased dramatically in the last years and there is a growing attention to its implications for human security. In contrast, the number of empirical studies is still limited, because EIM is a relatively new issue and the matter is very complex and interdisciplinary.

\textit{The EACH-FOR Project}

The most comprehensive empirical research project on EIM so far is the “Environmental Change and Forced Migration Scenarios” (EACH-FOR) Project, a two years long project supported by the European Commission in its 6\textsuperscript{th} Framework Programme, and carried out by a consortium of researchers from January 2007 through March 2009. EACH-FOR researchers conducted 23 case studies covering 6 regions, namely Europe and Russia, the New Independent States (NIS) and Central Asia, Asia, Sub-Saharan Africa, the Middle East and Northern Africa, Latin America and the Caribbean. The objective was not only to study the causes of forced migration with respect to environmental degradation and climate change, but also to provide plausible future scenarios for EIM.

Several important lessons can be drawn from EACH-FOR:

- There are various environmental problems that can contribute to the decision to migrate, such as soil degradation and erosion; deforestation; desertification; water, soil and air pollution; water-logging and salinization of irrigated lands; landslides and mudslides; radiation from nuclear waste; saltwater intrusion and accelerated coastal erosion; flooding and riverbank erosion; tropical cyclones; extreme aridity and irregular rainfall; and sea level rise. Nevertheless, environmental migration is in many cases a traditional coping strategy as a response to some periodic/seasonal environmental events, such as droughts or floods. With the increasing severity of these environmental events, what used to be seasonal migration is becoming in many cases longer term or permanent migration.
- Migration occurs when livelihoods cannot be maintained, especially in the cases of farming, fishing and cattle herding, where people rely on environmental services on daily basis. If the environment completely deteriorates, then there is no other way for these people to survive. Nevertheless, migration decisions are complex, i.e. many of the people interviewed in the frame of the project did not attribute their migration entirely/directly to environmental factors but referred to low income and bad living conditions, or in some cases to political and social conditions, even though in most cases the root causes were clearly environmental.

\textit{While the environment can be an important ‘push factor’ for migration (and in some cases it is the sole driving factor), it is often closely interwoven with other social, economic and political triggers for migration decisions. Other ‘push’ factors include lack of infrastructure (social services, education…etc.) and the withdrawal of the state from}

\footnote{United Nations (2009), Report of the Secretary General on “Climate Change and its possible security implications”, A/64/350.}
rural areas. At the same time, there are often significant ‘pull factors’, especially more promising economic opportunities elsewhere and the supposed attractions of urban areas. Once migration has started, it reinforces further migration, by networks that facilitate migration and ‘a culture of migration’\textsuperscript{20}.

The financial factor plays an important role in environmental migration; clearly, people who want to leave their villages/regions/countries can only do so, if they have the financial means, information and networking in the destination areas that support their decision. One other important finding of the EACH-FOR Project is that usually young men tend to migrate, leaving women, children and elderly behind. In many cases, both migrants and those left behind are worse off than they would have been, if migration had not taken place at all.

The case of forced displacement as a result of development projects, such as dam construction, provides valuable lessons regarding the resettlement process, in particular the need for participatory processes with resettled people. However, it can be very complicated to have a participatory process for resettlement, especially when populations at risk refuse to evacuate, either because they want to defend their properties or because they do not recognize the threat.

Last but not least, EACH-FOR shows that the push factors are not only very complicated but also strictly related to the region involved; the differences in key policy recommendations given for different regions reflect this specificity needed when approaching EIM.

Section 2 - Impacts of EIM on Sustainable Development and on the MDGs

“Research should be conducted on how environmental factors interact with socio-economic factors as a cause of migration” (Agenda 21, Paragraph 5.20).21

Sustainable development has been defined in many ways, but the most frequently quoted definition is from The Brundtland Commission Report, Our Common Future22:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. Further, Principle 1 of the Rio Declaration states that: “human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature”. That contains within it two key concepts:

- the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

The sustainable development principles include:

- Integration of economic, social and environmental objectives and ensuring balance across sectors, territories and generations;
- Development of capacity and an enabling environment throughout the coordinated, participatory and iterative process of thoughts and actions;
- Improving access to information tools and inter-organizational coordination to support decision-making;
- Ensuring broad participation and effective partnerships;
- Fostering country ownership and commitment; and
- Focusing on outcomes and means of implementation.

There is a lot of concern, both at the political and academic levels, about the risks related to population growth and immigration that might exacerbate economic, social and political pressures in the receiving regions. Unfortunately, less attention is paid to the risks for sending regions that face environmental hazards, hereby pushing their populations to move; the sending regions will undoubtedly suffer from the consequences of a decrease in their populations and are exposed to the risk of brain drain. Their

situation is exacerbated by the fact that these regions often lack the means to effectively deal with the problem.

In case of slow-onset environmental problems, such as desertification, when people move to other countries/regions, they create a vicious circle of further environmental problems; in the sending regions, restoring the environment by planting new trees is a challenge for the young mothers who have to take care of the children and the elderly as well, after many young men leave. This leads to more and more environmental damage. In analyzing the migration/MDGs nexus, we cannot single out EIM, and it is hard to draw general lessons due to the lack of a strong scientific basis and appropriate data on EIM. In fact, several studies have analyzed the relationship between migration and the MDGs, but no study has focused on the specific impact of environmentally induced migration.

Eighty-two States Members of the UN have reported to the Commission on Sustainable Development (CSD) or to the DSD that they were implementing a National Sustainable Development Strategy (NSDS) in 2007, defined as “the way in which a country is addressing the challenge of progressing towards its goals of sustainable development. It is a plan or method for achieving these goals and, thus, reflects an ongoing process and not a “one-off” document.”

The importance of including EIM in NSDS and in other relevant country policies and programs in the sending regions comes from the fact that early planned population movements can be beneficial, while sudden forced migration is usually not. When it comes to receiving regions, policymakers need to know the number of migrants, but it is not important for them to identify environmentally-induced migrants as a specific category. Every country can determine for itself the approach and the content of its NSDS, ensuring that economic, social and environmental objectives are integrated. This country-led approach is very important: when it comes to EIM management, there is no one size-fits-all strategy.

The relationship between EIM and sustainable development can be analyzed through its three strongly interrelated economic, social and environmental pillars.

**The economic pillar**

The main principles of the economic component of sustainable development are that society’s well being would have to be maximized and poverty eradicated. The concept of "needs" emphasized in the Brundtland Commission Report “Our Common Future” refers

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in particular to the basic needs of the world's poor, to which overriding priority should be given.

Poverty and climate change are two great economic, social and political challenges of the 21st Century. It is to be hoped that developing countries will be able to significantly reduce poverty, but policymakers should keep in mind that EIM might actually increase as poverty decreases, both because of the environmental impact of increased production and consumption and because more people would have the financial means to migrate if they are willing to. On the other hand, the increase of migration might lead to more poverty in the regions of destination, since when people migrate to new regions, the probability of overexploiting environmental services increases, and the conflict of growing populations over the limited natural resources might have its implications on poverty. At the same time, fleeing environmental problems in the regions of origin might lead to more environmental damage in the same regions, which exposes the people left behind to more vulnerability, livelihood deterioration and poverty.

Black and Sward (2009) point out that there is limited attention to migration in the Poverty Reduction Strategy Papers (PRSPs): 78 out of the 84 PRSPs they reviewed deal with the issue of migration, but the vast majority of them focuses on international migration and remittances, with few PRSPs dealing with other potentially positive aspects of out-migration.

The most affected economic sectors are likely to be the ones that most directly depend on the ecosystem, such as agriculture, forestry and fisheries; they can induce migration through environmental degradation when the techniques used are not sustainable and there is land overuse, deforestation or over fishing. Agriculture, land-use change and forestry represent 30.9 percent of total Greenhouse Gas (GHG) emissions.

Migration and the environment are interrelated to tourism, and the sea-level rise can be a challenging problem, since many of the tourist attractions in the SIDS and in the coastal regions all over the world are within one or two meters above the sea level. At the same time, the tourist sector can help dealing with EIM, since agricultural workers that are forced to leave their lands may find the best alternative job opportunities in the tourism rather than in the manufacturing urban sector.

In the case of Egypt (one of the most affected countries), UNEP (2002) expects a 0.5 m sea-level rise to affect 3.8 Million Egyptians and 1800 km² of Egyptian cropland and a 1 m sea-level rise to affect 6.1 Million Egyptians and 4500 km² of cropland. On the other hand, local Egyptian experts are not always conscious of this risk. There are even studies that attempt to prove the opposite; for example, Elshinawy (2008) mentions that studies which warn of horror scenarios with regard to sea-level rise in Egypt assume zero

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level for lake borders (Al-Burullus and Al-Manzalla lakes) and do not consider the Mohammed Ali sea wall at Abu-Quir Bay (Alexandria). Therefore, he assumes that only 1.0 to 3.0 percent of the Nile Delta in Egypt might suffer from sea-level rise, which should not have tremendous implications on environmental migration in the country. The real estate sector of the sending regions that has been strongly hit by the recent economic and financial crisis will be threatened by environmental change in the next decades; buildings in areas threatened by environmental hazards of all kinds might decrease in value soon, since people are willing to leave those areas. A pivotal role for the evolution of EIM and its impact on sustainable development will be played by the utilities sector; migration movements imply changes in the geographical distribution of the population and, as they are usually not planned (at least in the case of EIM), they might lead to severe problems related to the availability and distribution of utilities. The ability of governments to effectively manage EIM, as well as any other kind of migration, will depend on their capacity to guarantee the supply of utilities, especially with regard to water and energy.

**Box 1 - Bangladesh**

Bangladesh is one of the most vulnerable countries with respect to climate change and EIM. Environmental changes in this Asian country include glaciers melting from Himalaya, riverbank erosion and desertification in the North; cyclones, floods, sea-level rise and contamination of freshwater sources by seawater in the South. Riverbank erosion is the single greatest environmental push factor for EIM there. The population has adopted preventive measures such as piling sandbags, building bamboo crates and fences at the waterfront and several other adaptive strategies. However, none of these strategies is working properly and many people are forced to leave their homes in response to riverbank erosion: according to Islam (2009), around one million people are displaced by this environmental stressor annually, while the Disasters Management Bureau (DMB) states that the number of people annually displaced by riverbank erosion is around 500,000. It is very hard to give accurate estimates due to the lack of reliable data. In Bangladesh, the environmentally induced displacees usually try to stay at their place.

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34 Islam, M. Z.A. (2009a): *Indigenous Adaptation Strategies of the Riverbank Erosion Displacees in Bangladesh: A Study of Two Northwestern Riparian Villages*, paper presented at the International Human Dimensions Programme on Global Environmental Change (IHPD) Open Meeting 2009. His estimate of one million people is based on The Riverbank Erosion Impact Study (REIS) that is based on more or less 50 focus group discussions (FGDs) conducted in three mostly affected districts: Kurigram and Sirajganj in northwestern and Bhola in southern (coastal) Bangladesh.

of origin. It is found that the riparian people were displaced 10 times in their life time and that they always tried to stay at their place of origin. Some of them who could afford purchased land for resettlement in safer places, when they apprehended that their homestead would have finally been engulfed by the attack of riverbank erosion. Most of them stayed and built their huts beside the road, on flood preventing embankment, on khas land (government-owned land), and on relative’s or neighbor’s land, and a considerable number of them took shelter under the shed of relatives or neighbors. The majority of the rural people in northern Bangladesh (Nilphamari, Lalmoinirhat, Kurigram, Rangpur, Gaibandha districts) remain jobless and foodless during two lean agricultural seasons (from Mid-March to Mid-May, and from Mid-September to Mid-November). The adverse environmental situation is induced by drought from Mid-March through Mid-May and by less rainfall from Mid-September through Mid-November. It is noteworthy that the sandy soil is not capable of reserving water on its surface for cultivation in dry seasons and thus irrigation is not working well due to its sandy feature. The farmers are used to adopt traditional methods in their farming activities. Consequently, during the two lean seasons, the farmers have no agricultural activities and the massive agricultural workers find no work and food. This alarming situation is locally called monga.

Bangladesh is an example of both direct and indirect long term EIM: the root causes of economic stressors for migration are often environmental. According to Poncelet (2009) who prepared the Bangladesh Case Study Report for the EACH-FOR Project, “The extreme hot weather prevents the regular yield of crops. Subsequently, the price of food becomes too high for poor people and they often cannot maintain the family. Similarly, Monga in the North (and salinity of water in the South) makes people more vulnerable to poverty. The increased number of floods and cyclones affects the production of crops. The income from agriculture becomes too low to maintain families, which strongly influences the decision to migrate. As we can see, these economic factors are clearly related to environmental reasons even though they are not necessarily expressed as such (p.9).”


The social pillar

The social component in sustainable development refers to the relationship between nature and human beings, uplifting the welfare of people, improving access to basic health and education services, fulfilling minimum standards of security and respect for human rights. It also refers to the development of various cultures, diversity, pluralism and effective grass roots participation in decision-making. The issue of equity, i.e., the distribution of benefits and access to resources remains an essential component of both the economic and social dimensions of sustainable development.

Past studies have confirmed that those displaced experience more negative effects to their health than those who are settled. In addition, refugee populations are more likely to be subject to sexual abuse and human trafficking than the receiving populations. EIM from rural to urban areas can compromise food security, because even though these migrants might earn more money by leaving the rural areas, they leave their farms behind, hereby reducing the potential food supply. In developing countries, where an important part of food production is not sold on the market, more food has to be sent from rural production areas to the densely populated urban consumption areas; an efficient transportation sector is necessary in order to prevent food crises. EIM can induce conflict over natural resources in receiving regions, if the population exceeds the carrying capacity of the region. The case of Darfur portrays how environmental issues can lead to violence: tribes living in this area of Sudan were in a never-ending competition over the scarce natural resources of that land and the conflicts that occurred in this region due to environmental degradation only further contributed to harming the land. EIM is likely to exacerbate water problems, especially in the case of rural-urban migration: When water is diverted from agriculture to urban areas, agricultural productivity can be severely affected. Households in urban areas consume more water than in the rural areas; in Guatemala, for example, the daily water consumption per person in urban areas is 120 liters, twice as much as it is the case in rural areas. Moreover, urban centers rely on adjacent ecosystem services to break down their biodegradable wastes. The number of environmentally induced migrants moving to the urban areas will determine the number of slum dwellers and the excess population in slums may push people to leave them and relocate somewhere else. However, the impact will in part depend on how many migrants moving from rural to urban areas will actually settle in the slums.

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42 Instituto de Agricultura, Recursos Naturales y Ambiente (IARNA), Universidad Rafael Landívar (URL) y Asociación Instituto de Incidencia Ambiental (IIA) (2006): Perfil Ambiental de Guatemala: tendencias y reflexiones sobre la gestión ambiental, Guatemala.
The environmental pillar

The environmental component of sustainable development is concerned with the conservation and enhancement of the physical and biological resource base and ecosystems. The environmental impact of migration on the receiving regions can either be positive or negative, but it can be devastating, if people relocate to regions that are already environmentally fragile; for example, when lands are deforested to set up camps or settlements.

As for sending regions, the impact depends on the specific situation, but policymakers should keep in mind that, in case of temporary migration, large-scale returns can challenge environmental management in areas of origin. Migration can have a negative impact on transit regions too: migrants might behave opportunistically without caring about the long-run consequences of their behavior, because they know they are only temporarily staying in the transit region.

There are three main negative impacts of migration on biodiversity:

1. Species and genetic diversity loss from an area
2. Habitat loss and fragmentation
3. Loss of ecological connectivity and disruption of ecological and evolutionary process

The ecological impact of migration from developing to developed countries is usually negative, especially when there is a considerable difference between the ecological footprint per person in the sending and receiving countries. Nevertheless, most of the reported cases of environmental migration are cases where the migrants do not cross the borders of one country. Biodiversity is threatened by EIM since some regions might be gradually abandoned and plant and animal species that are specific to that region might be lost forever.

Migration induced by the sea-level rise has gained a lot of attention in the debate on EIM, probably because the link between sea-level and forced migration is very straightforward. The only recent cases of forced displacement due to sea-level rise are those of Tulun (Carteret) and Takuu (Mortlock) in Papua New Guinea, totaling around 2400 displaced people. However, numbers can increase dramatically in the next decades; approximately 146 million people are exposed to the rise of the sea-level, since they live in areas with an elevation of less than one meter above sea-level. Several countries, such as the Northern Group of the Cook Islands, Kiribati, Tuvalu, Tokelau, the Federated States of Micronesia, the Marshall Island and the Maldives are now highly threatened by the rising sea-level, and their populations might be forced to leave soon.

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Another important driver of EIM is desertification, defined by the United Nations Convention to Combat Desertification (UNCCD) as “land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities”\textsuperscript{47}.

Estimates of the percentage of the land affected or threatened by desertification show the seriousness of the problem, especially in the developing world. Africa is highly affected by the problem: about 43 percent of its dry land is either affected or prone to desertification. Asia is the most severely affected continent: 65 percent of West Asia’s dry lands are vulnerable to land degradation and desertification, and the same applies to 35 percent of China’s territory and more than 50 percent of the Central Asian dry lands. Finally, in Latin America and in the Caribbean, 25 percent of the territory is prone to desertification\textsuperscript{48}.

At the same time, migration can cause deforestation by many means: the settlement of farms by agricultural colonists; the extraction of timber for housing or fuel wood; the growth of demand for agricultural commodities by growing urban populations and inducing changes in institutions and agricultural technology. The future loss of forest cover because of agricultural expansion will also threaten biodiversity, since forests are the most biologically diverse regions in the world.\textsuperscript{49} In the Latin American region, more than elsewhere, the combination of land availability and migration is an important explanatory factor for deforestation.\textsuperscript{50}

\begin{center}
\textbf{Box 2 – Melting of the Himalaya glaciers and EIM}
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Another push factor related to climate change and environmental degradation is the melting of glaciers. In the Himalaya region, melting might lead to an increase of EIM in Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan.

As the glaciers melt, flooding risks increase and this affects human settlements in the river deltas. The agricultural system is the most exposed, as irrigation of the land depends on the water released by the glaciers during summer.

In the year 2000, the river basins of the rivers that drain the Himalaya mountains (the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze, and Huang He Rivers) collectively supported a population of 1.4 billion people, almost a quarter of the entire world’s population.\textsuperscript{51}


\textsuperscript{50} UNFPA (undated): \textit{MDG7: Ensuring environmental sustainability}, www.unfpa.org.br/lacodm/arquivos/mdg7.pdf, 21/01/10.

The number of people depending on the river basins of the above mentioned rivers might approach 2 billion people by 2050\(^{52}\); the number of people that will actually migrate is however uncertain and will depend on both climate change and the efficiency of adaptation policies, especially the construction of dams and the improvement of irrigation techniques. Nevertheless, the construction of dams to prevent EIM might result in population displacement too, as shown by the China Case Study Report of the EACH-FOR Project on “Forced migration and the Three-Gorges Dam”\(^{53}\): In that case, the Dam forced one to two million people to move away.

Impact on vulnerable regions

There are three main categories of vulnerable countries, namely developing countries, conflict-affected countries and Small Island Developing States (SIDS). Violent conflicts severely affect the countries where they take place and they can have detrimental environmental effects, ranging from contamination and pollution from weapons and war damage, to destruction from poor regulation and management and general neglect.\(^{54}\)

The main concerns of conflict-affected countries are security and economic development; their legal system is usually very ineffective and they face problems related to the lack of reliable data and information. Conflict and threat of conflict act as pushing factors for migration. Africa is the primary area of potential conflict induced by rapid population growth and environmental stress and the Middle East and some other regions in Asia and Northern South America are potential ‘hot spots’ too.\(^{55}\)

Five main climate change-related factors threaten the viability of living on SIDS: sea-level rise, increased severity and intensity of storms, changes to marine resources, increasing acidity of oceans and changes to freshwater resources. The Northern Group of the Cook Islands, Kiribati, Tuvalu, Tokelau, the Federated States of Micronesia, the Marshall Island and the Maldives are all now highly threatened by the rising sea-level. It is hard for these islands to plan evacuation in the long-term, because they are always threatened by the possibility of an extreme event that would suddenly force their populations to move.\(^{56}\)


\(^{54}\) www.unep.org/conflictsanddisasters/


Box 3 – Tuvalu

Tuvalu, formerly known as the Ellice Islands, is an island nation in the southwest Pacific Ocean. The population of 11,636 (est 2005) live on Tuvalu’s nine atolls, which have a total land area of 10 square miles, or 27 square kilometers. Some climate change and sea level rise challenges observed in Tuvalu are listed in Tuvalu’s National Adaptation Programme of Action:

a) High groundwater level during high rainfall intensities and rising sea level; 
b) High incidences of water scarcity due to high frequency of low rainfall days and prolonged drought, especially on highly populated areas such as Funafuti; 
c) Decrease in agricultural productivity due to pest and fruit flies infestation; 
d) Decrease in coral and lagoon fisheries productivity due to the high soil erosion burying adjacent corals; 
e) Increasing severity of coastal erosion; 
f) Increasing and wider saltwater intrusion into coastal areas and pulaka pits; and 
g) Coastal flooding and inundation.”

The case of Tuvalu, more than any other, shows the potential for long-term direct EIM, and it shows that entire countries might disappear due to environmental change. Several questions will have relevant legal and political implications in the next decades: Who would welcome migrants from islands like Tuvalu? Under what legal status? What degree of political independence would they have in their destination regions?

New Zealand guarantees residence to 75 Tuvaluans every year through the Pacific Access Category (PAC). The selection process is fairly strict: Applicants have to be aged between eighteen and forty-five, possess minimum English language knowledge and a valid job offer from New Zealand, and they have to meet minimum income requirements. However, the PAC cannot be a satisfactory framework to deal with EIM from Tuvaluans; the number of people involved (75 a year) is too limited and the strict selection criteria will not allow the most exposed Tuvaluans to move to New Zealand.

Relocating the Tuvaluan population in another country would not only lead to increasing social, economic and ecological pressures on the receiving regions but would also threaten the Tuvaluan culture and identity, including the language and unique ecological system.

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Section 3 – Adaptation and policy options for EIM

“Our responses to climate change today will help determine whether migration will be a matter of choice in a wider range of adaptation options, or whether forced migration and displacement will be a matter of mere survival due to a collective failure to provide adequate adaptation alternatives”\(^{60}\) (Warner et al., 2009)

**Box 4: Definitions of adaptation to climate change**

**Adaptation** - Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished, including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation (IPCC, 2001)

**Adaptation** - Practical steps to protect countries and communities from the likely disruption and damage that will result from effects of climate change. For example, flood walls should be built and in numerous cases it is probably advisable to move human settlements out of flood plains and other low-lying areas. (Website of the UNFCCC Secretariat)

**Adaptation** - Is a process by which strategies to moderate, cope with and take advantage of the consequences of climatic events are enhanced, developed, and implemented. (UNDP, 2005)


It is difficult to analyze the adaptation and other policy options for EIM in general, since they should be region-specific and vary a lot, depending on the environmental stressors leading to migration.

Seasonal migration in several African Sahel and Sub-Saharan countries is part of the culture; nomads used to move to the fertile lands and had gentlemen agreements with the farmers who offered their grass as animal fodder and made use of the cattle in having their lands fertilized. In addition, farmers used to leave their land plots during the dry seasons to seek simple informal jobs in the capitals or metropolitan centers and return back to their land plots in the rainy seasons. With the rapid population growth and the impacts of climate change, such mobility could have its negative implications, given the conflicts that can arise under these new conditions, leading in turn to conflicts over the property rights, especially in the absence of written contracts\(^{61}\).

The 2nd Expert Workshop on Climate Change, Environment, and Migration, organized by UNU-EHS, in cooperation with IOM, the Munich Re Foundation, and UNEP,

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analyzed the question ‘Under what conditions does migration become an adaptive strategy?’ Several steps were proposed in order to be able to answer the question:

1. Find an agreed working definition of adaptation
2. Map hot spots of climate change and migration
3. Develop basic documentation of existing experience with relocation and resettlement, and “good practice” guidelines
4. Share experiences with migration and displacement, especially at the governmental level
5. Take participatory approaches that encourage stakeholder dialogue, empower people made mobile because of environmental factors (particularly climate change), and help ensure cultural continuity of affected communities

People are already moving in response to environmental stress in many parts of the globe and will increasingly do so in the next years. EIM, both internal and international, has to be included in the National Adaptation Programmes of Action (NAPAs) of the sending regions, and indeed in any relevant programme implemented in order to deal with the unavoidable impacts of climate change. The most vulnerable regions are often poor, and hence, financing for adaptation will be one of the most important challenges for the international community in the 21st century. The NAPAs, conceived at the Conference of Parties at its 7th session (COP7) in Marrakech (Morocco) in 2001, were designed to be a means through which developing countries could be able to find the financial resources they needed in order to adapt to climate change. According to the IPCC AR4, aside from financial issues, “technological, cognitive, behavioral, political, social, institutional and cultural constraints limit both the implementation and effectiveness of adaptation measures”.

As of September 2009, 43 NAPAs were available in the UNFCCC Secretariat. NAPAs Priority Projects by Sector are divided into 12 sectors: cross-sectoral, food security, coastal zones and marine ecosystems, early warning and disaster management, education and capacity building, energy, health, infrastructure, insurance, terrestrial ecosystems, tourism and water resources. There is no specific project on EIM, but some of the projects, especially the ones on terrestrial ecosystems, can have a relevant impact on human settlements and potential migration.

However, NAPAs have been criticized for three main reasons:

1. They put in place similar projects in different countries, without taking into consideration the specific needs of the latter;
2. Many NAPAs projects are very similar to standard development projects;
3. There is a lack of involvement of the major ministries and decision makers

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In the work undertaken by COP15, on the basis of the report of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention on Climate Change, it is stated in Annex II titled ‘Enhanced action on adaptation’ that “the Conference of Parties...4. invites all Parties to enhance adaptation action under the Copenhagen Adaptation Framework (for Implementation) taking into account their common but differentiated responsibilities and respective capabilities, and specific national and regional development priorities, objectives and circumstances, (and whereby developing country Parties shall be supported by developed country Parties and in accordance with paragraph 6, to undertake, inter alia: 

(f) Measures to enhance understanding, coordination and cooperation related to national, regional and international climate change induced displacement, migration and planned relocation, where appropriate.”

As already stated above, cooperation between migration experts and development experts and policymakers is the key to an efficient adaptation policy. Five further points about adaptation policies are to be highlighted:

1. Well defined integration policies for migrants are very useful to ensure peace in the receiving regions;
2. It is very important to have an efficient banking system that allows international remittances at an affordable price;
3. Shelter, water and energy availability, basic infrastructure, health and food security should be the priorities of the adaptation policies for EIM;
4. Sending countries might face brain drain, and thus, it is important for these countries to study the possibility of implementing policies encouraging skilled labor to stay. Also, it could be useful to give incentives to out-migrants to return to their origin countries, so that the region can benefit from the knowledge acquired by the returnees in their time spent abroad;
5. The insurance system can be very important for potential environmentally induced migrants, both to prevent and to manage EIM, even though most of them are likely not to have the financial means to pay for a private insurance.

One of the main problems related to the idea of planned EIM as a positive adaptation strategy is that people often do not realize that the environment is degrading until they face the consequences of this degradation; this leaves their migration unplanned and thus characterized by the stresses associated with more forced migratory responses. Moreover, resettlement exposes migrants to risks of discrimination, marginalization, lack of economic opportunities and cultural assimilation.

Adaptation strategies that allow potential migrants to remain in their home community, if they choose so, should be the priority; planned EIM should only be used as an adaptation strategy when it is not possible for the migrants to stay.

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**Sustainable development as a way to prevent EIM**

The best way to deal with EIM, especially long-term EIM, can be implementing sustainable development strategies and including specific policies to deal with migration. Special attention should be given to the environmental push factors in NAPAs, NSDS, PRSPs, conflict prevention strategies and all kind of development policies. As for development policies, economic diversification should be pursued in countries that rely on agricultural production and that might be threatened by soil erosion, land degradation, desertification and other factors threatening the efficiency of the agricultural system. The same holds for countries primarily relying on fishing. Small rural villages are the most affected settlements. Hence, micro-credit can be used as a tool to prevent people stressors from effectively migrating, if it is better for them to stay. Risk reduction strategies should be included in development strategies, not only for natural disasters, but also for environmental degradation and to limit the negative consequences of climate change and climate variability. Finally, potential hot spots have to be identified to plan efficient early warning systems and to have an effective risk management.

In many cases, there are strong arguments for preventing EIM, firstly, because the burden on the people left behind increases, given the worsening environmental conditions; secondly, because migrants do not necessarily find better livelihoods in the regions of destination; and thirdly, because migrants could cause further environmental problems in the regions of destination. Therefore, the role of governments and Non-Governmental Organizations (NGOs) is crucial in mobilizing the efforts that help people stay in the regions of origin, restore the environment and participate in projects that can combat the environmental deterioration. This needs a long term strategy and strong action plans where international and UN organizations, such as UNCCD and UNFCCC should be involved.

In the cases where EIM has occurred, institutional measures should be taken to cope with the problem, such as training the migrants and helping them return back and restore the environment or help them adapt and get integrated - but not necessarily assimilated - in the regions of destination.
Section 4 - The way forward

Policies and programs to deal with EIM should be region-specific and should be studied in relation to the environmental stressors pushing the populations to move; for example, some of the points listed below would not be appropriate for the case of migration induced by the sea-level rise. Implementing effective policies and programs to deal with EIM requires the following elements:

1. **Stronger scientific basis and appropriate data collection**: These are needed by policymakers at all levels in order to design appropriate policies to deal with EIM. The debate on EIM is very open and the issue is gaining increasing attention both at the political and at the scientific level. However, there is not enough empirical evidence, and successful stories are to be shared to draw lessons for future migration policies. The 2010 round of censuses represents a great opportunity to improve our understanding of the environment-migration nexus.

2. **Effective legal systems and respect of human rights**: These are necessary prerequisites to sustainable development. Moreover, environmentally induced migrants might be forced to enter foreign countries illegally, if they cannot do it legally, which would further exacerbate their lack of protection.

3. **Participatory and transparent process**: This is needed to prevent possible negative security implications of EIM.

4. **Policy coherence, both at the horizontal and at the vertical level**: With regard to the horizontal dimension, a multi-sectoral approach is a key to successful policies. Coordination is needed, in particular, between migration and development policy makers; on one hand, migration has to be taken into consideration when designing development policies and on the other, migration policies have to be designed in a sustainable way and have to take into account their impact on the environment, on the economy and on the society. At the vertical level, an internationally agreed legal framework for EIM would help develop efficient institutional and legal framework at the national level. Policy coherence is also needed between the different layers of government.

5. **Adequate funding**: This is necessary both for the prevention and adaptation to EIM; development ministries and experts should work in close cooperation with people that deal with migration to make sure that the financial resources are used in the most efficient way.

6. **Technical expertise development and promotion of dialogue between experts in different fields**: EIM is a very new and complex topic, and therefore, many developing countries lack not only the financial but also the technical resources needed to implement effective policies. This is exacerbated by the fact that most of the empirical studies on EIM and its impact on development have been conducted in the developed world and that these studies have mainly dealt with the effect of EIM on receiving countries.

7. **Consideration of the needs of the most vulnerable**: Women, children and the elderly are the most exposed to the costs of EIM for the sending regions;
adaptation programmes and development policies should take into account the needs of the most vulnerable that are often left behind.

8. **Synergies between sending and receiving regions**: Bilateral and multilateral agreements can facilitate the migration process and of the crossing between supply and demand in the labor market; transit regions should be involved in the negotiations too. There are many political and financial reasons why there is no international migration regime today; destination countries often do not have an incentive to seal a deal. Moreover, it is easier to identify synergies in international trade than in migration. Finally, there is a lack of international leadership on this issue.\(^{67}\)

9. **Risk management**: Policymakers and scientists should try to reduce the risks related to natural hazards and environmental degradation. They should implement development policies that take into account not only the impact on the environment but also the potential for migration as an outcome of environmental degradation and natural hazards.

10. **An inclusive approach to the issue**: EIM cannot be properly dealt with by trying to single out the factors that push people to migrate; the Sustainable Development Approach is the most appropriate, as it takes into account all the dimensions of the decision to migrate.

The lack of clarity about the interrelation between the environment and other stress factors, especially poverty and security, hinders the inclusion of EIM in development strategies. EIM should be singled out in the sending regions in order to study the possibility to prevent and/or manage it, while the priority for receiving countries should be to create solid data bases on migration. In addition, more attention should be given to internal movements within the boarders of one country.\(^{68}\)

The possibility of using EIM as an adaptive strategy depends on the information available to the decision-makers and the potential migrants; people often realize the environmental threat only when they are forced to leave.

In many cases, national, regional and local governments last only for a few years, which might make them lack the willingness to promote sustainable development policies on EIM, especially that the fruits would be gained in the very long-term.

International institutions can bridge this timing gap by taking a long-term perspective, promoting international dialogue and implementing effective policies to deal with EIM. Moreover, they can play an important role in finding an agreed upon legal framework for both internal and international EIM.

More case studies are needed to draw lessons for the future and to better understand the policy implications of EIM.

The challenge for policy makers is to make sure that the use of natural resources results in economic growth and poverty alleviation without compromising the environment.

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Finally, they have to develop a consistent strategy to prevent EIM and to deal with it from a sustainable development perspective.