

THE INTERNATIONAL ORGANIZATION  
FOR MIGRATION IS COMMITTED TO  
THE PRINCIPLE THAT HUMANE No. 10  
AND ORDERLY INTERNATIONAL  
MIGRATION DIALOGUE BENEFITS  
MIGRANTS AND ON MIGRATION  
SOCIETY IOM ASSISTS IN MEETING  
THE GROWING OPERATIONAL  
CHALLENGES OF MIGRATION  
MANAGEMENT EXPERT ADVANCES  
UNDERSTANDING SEMINAR: OF  
MIGRATION MIGRATION AND  
ISSUES THE ENVIRONMENT  
ENCOURAGES SOCIAL AND  
ECONOMIC DEVELOPMENT  
THROUGH MIGRATION UPHOLDS  
THE HUMAN DIGNITY AND WELL-  
BEING OF MIGRANTS





No. 10

**INTERNATIONAL  
DIALOGUE  
ON MIGRATION**

**EXPERT  
SEMINAR:  
MIGRATION AND  
THE ENVIRONMENT**



IOM International Organization for Migration



**mprc**

IOM - Migration Policy, Research and Communications

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This book is published by the Migration Policy, Research and Communications Department (MPRC) of the International Organization for Migration. The purpose of MPRC is to contribute to an enhanced understanding of migration and to strengthen the capacity of governments to manage migration more effectively and cooperatively.

Opinions expressed in the chapters of this book by named contributors are those expressed by the contributors and do not necessarily reflect the views of IOM.

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*The primary goal of IOM is to facilitate the orderly and humane management of international migration... To achieve that goal, IOM will focus on the following activities, acting at the request of or in agreement with Member States: ...*

*7. To promote, facilitate and support regional and global debate and dialogue on migration, including through the International Dialogue on Migration, so as to advance understanding of the opportunities and challenges it presents, the identification and development of effective policies for addressing those challenges and to identify comprehensive approaches and measures for advancing international cooperation... (IOM Strategy, adopted by the IOM Council in 2007).*

IOM launched its International Dialogue on Migration at the 50th anniversary session of the IOM Council in 2001. The International Dialogue on Migration works through the IOM Council and regional dialogues and pursues cooperation and partnership with governments, UN and other international and regional organizations, non-governmental organizations and other migration stakeholders.

The purpose of the International Dialogue on Migration, consistent with the mandate in IOM's constitution, is to provide a forum for Member States and Observers to identify and discuss major issues and challenges in the field of international migration, to contribute to a better understanding of migration and to strengthen cooperative mechanisms between governments and with other key stakeholders to comprehensively and effectively address migration issues. This initiative is designed ultimately to enhance the capacity of governments to ensure the orderly management of migration, promote the positive aspects of migration, and reduce irregular migration. Other policy domains such as labour, development, environment, trade and health, are increasingly relevant to migration management and therefore are bringing migration onto the international agendas of other sectoral fora. The International Dialogue on Migration encourages exploration of the links between international migration and these other sectors.

Through working together in the selection of guiding themes, each year the International Dialogue on Migration

and its accompanying activities have built upon the ideas and perspectives brought out in previous sessions. The open, inclusive, informal and constructive dialogue that has developed, supported by targeted research and policy analysis, has indeed fostered a better understanding of contemporary migration issues. It has also facilitated the identification of effective practices and approaches through the sharing of practical experiences, perspectives and priorities. As important, the International Dialogue on Migration has helped create a more open climate for migration policy debate and has served to build confidence between and among the various stakeholders in migration.

The International Dialogue on Migration (or the Red Book) Series is designed to capture and review the results of the events and research carried out within the framework of the Dialogue. The Red Book Series is prepared and coordinated by the International Dialogue on Migration (IDM) Division of IOM's Migration Policy, Research and Communications Department (MPRC).

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This publication includes the materials of the two-day expert seminar on Migration and the Environment organized by IOM with the co-sponsorship of the United Nations Population Fund (UNFPA), held in Bangkok, Thailand on February 22 and 23, 2007. On the IOM side, this event was a joint effort of the IDM Division, MPRC and the Mission with Regional Functions (MRF) in Bangkok. MPRC and MRF Bangkok would like to thank UNFPA for making this event possible.

This publication was prepared under the supervision of Philippe Boncour, Head, International Dialogue on Migration Division, MPRC. It comprises three main elements. Part I contains the summary report of the expert seminar based on speeches and debates, as well as the possible policy responses and ways forward discussed during the event. Special thanks for the preparation of the report are owed to Jennifer Zimmermann - the principal author - and to Jobst Koehler, Christine Aghazarm and Erika Pinheiro. Part II includes the expert seminar agenda and Part III contains the abstracts of speeches and presentations made during the seminar.

## **International Organization for Migration (IOM)**

Established in 1951, IOM is the principal intergovernmental organization in the field of migration and works closely with governmental, intergovernmental and non-governmental partners. With 122 member states, a further 18 states holding observer status and offices in over 100 countries, IOM is dedicated to promoting humane and orderly migration for the benefit of all. It does so by providing services and advice to governments and migrants.

The IOM Constitution gives explicit recognition to the link between migration and economic, social and cultural development, as well as to the right of freedom of movement. IOM works in the four broad areas of migration management: migration and development, facilitating migration, regulating migration and addressing forced migration. IOM activities that cut across these areas include the promotion of international migration law, policy debate and guidance, protection of migrants' rights, migration health and the gender dimension of migration.

Migration has implications for and is influenced by a variety of policy matters, one of which is the environment. In the cross-cutting area of migration and the environment, IOM addresses linkages between the environment on the one hand, and human settlement and population movement on the other from a human mobility perspective. IOM provides advice on policies and practices appropriate to address the challenges facing mobile populations today, including those resulting from extreme environmental events or gradual environmental degradation, and implements relevant projects. Through its programmatic activity, IOM is also applying migration management tools to prevent and mitigate the negative effects of the movement of people on the environment, including in cases of mass migration. IOM is committed to close cooperation with relevant international and non-governmental organizations, governments and other relevant stakeholders to develop more comprehensive strategies to better manage environmental migration and to address potential impacts of migration on the environment.

## **United Nations Population Fund (UNFPA)**

UNFPA, the United Nations Population Fund, is an international development agency that promotes the right of every woman, man and child to enjoy a life of health and equal opportunity. UNFPA supports countries in using population data for policies and programmes to reduce poverty and to ensure that every pregnancy is wanted, every birth is safe, every young person is free of HIV/AIDS, and every girl and woman is treated with dignity and respect. UNFPA, which began its operations in 1969, helps governments, at their request, to formulate policies and strategies to reduce poverty and support sustainable development. The Fund also assists countries to collect and analyse population data that can help them understand population trends. And it encourages governments to take into account the needs of future generations, as well as those alive today. UNFPA is guided in its work by the Programme of Action of the International Conference on Population and Development which affirmed the interrelationships between population, sustained economic growth and sustainable development and the close links between sustainable development and reproductive health and gender equality. Reaching the goals of the Programme of Action is also essential for achieving the Millennium Development Goals. UNFPA brings its special expertise in reproductive health and population issues to the worldwide collaborative effort of meeting the Millennium Development Goals.

International migration has important implications for demographic dynamics and thus for the core mandate of UNFPA. The Fund's approach towards policy and programmatic interventions in this area is rights-based and culture- and gender-sensitive. Among issues of particular concern are demographic implications of migratory movements; migration and the spread of diseases such as HIV/AIDS; the provision of basic social services, including reproductive health services, in areas of destination; and protection of the human rights of migrants. UNFPA seeks to provide directed policy, advocacy and technical support at critical policy, programming and monitoring levels to ensure that international migration is recognized as an important factor in development. UNFPA's 2007 State of World Population report,



*Unleashing the Potential of Urban Growth* highlights the linkages between population, urbanization and the environment. Ecological problems, such as global climate change, are adding to the threats to the well-being of future generations. The poor, especially women, are particularly affected by environmental degradation and climate change. UNFPA supports the development of national capacities in the production, analysis and dissemination of data and research in the area of population and environment, and supports research on population and environment linkages.



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**EXPERT  
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## **ACRONYMS AND ABBREVIATIONS**

<b>CILSS</b>	Permanent Interstate Committee for Drought Control in the Sahel
<b>EEE</b>	Extreme Environmental Events
<b>IASC</b>	UN Inter-Agency Standing Committee
<b>ICPD</b>	International Conference on Population and Development, held in September 1994 in Cairo, Egypt and its Program of Action
<b>IDM</b>	International Dialogue on Migration
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IUCN</b>	International Union for Conservation of Nature
<b>LAC</b>	Latin-American Countries
<b>MA</b>	Millennium Ecosystem Assessment
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>PROCASUR</b>	Corporation for Regional Rural Development Training
<b>RPG</b>	Refugee Policy Group
<b>UNEP</b>	United Nations Environment Programme
<b>UNFPA</b>	United Nations Population Fund
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UNMD</b>	United Nations Millennium Declaration



**PART I:  
REPORT OF THE SEMINAR**



# INTRODUCTION

Environmental degradation, climate change and migration are not new to the global community. However, managing these phenomena has become both more challenging and more critical to ensuring human security and sustainable development. Not only are gradual and sudden forms of environmental change acquiring greater magnitude, but they are likely to lead to ever larger waves of internal and international migration, including mass human displacement. Migration is also having a demonstrable impact – at times positive, at others negative – on the environment in communities of origin and destination. Both phenomena are figuring more prominently in the eruption of new and old conflicts.

Recognizing the need to support improvements in research and policy for more effective management of the associations between migration, the environment and other intermediating social, economic and political factors, the International Organization for Migration (IOM)<sup>1</sup> and the United Nations Population Fund (UNFPA) co-sponsored a two-day *Expert Seminar on Migration and the Environment* in Bangkok, Thailand on 22-23 February 2007.

This seminar builds upon earlier initiatives supported by IOM and UNFPA in the field of migration and the environment. A few such initiatives include: the Conference on “Migration and the Environment”, held in 1992 in Nyon, Switzerland by IOM and the Refugee Policy Group (RPG); the International Symposium

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<sup>1</sup> IOM co-organized this seminar in the framework of IOM’s International Dialogue on Migration (IDM), whose purpose is to provide a forum for Member States and Observers to discuss the predominant issues and challenges in the field of migration as well as existing and potential policy responses.

on “Environmentally Induced Population Displacements and Environmental Impacts Resulting from Mass Migrations” convened in April 1996 in Chavannes-de-Bogis, Switzerland, by IOM, the RPG, and the United Nations High Commissioner for Refugees (UNHCR); and the “International Conference on Population and Development” (ICPD) held in September 1994 in Cairo, Egypt and its Program of Action.

The specific objectives of the IOM/UNFPA seminar in Bangkok consisted of:

- Exploring the two-way association between migration and the environment as well as the interaction of these phenomena with security; and
- Contributing to a more comprehensive research and policy agenda.

These objectives were pursued through four keynote presentations and subsequent discussion among 25 policymakers, practitioners and researchers from diverse fields.

This report provides an account of some of the main issues discussed during the seminar including: (a) definitional issues; (b) some critical dimensions of the migration and environment nexus, including: (i) the impact of gradual environmental change on migration; (ii) the impact of extreme environmental events on migration; (iii) migration’s effects on the environment; and (iv) the association with conflict potential; (c) improving data and research for informed policymaking and action; (d) possible policy responses and interventions; and (e) the main challenges and lessons learned and their implications for the way forward.

## DEFINITIONAL ISSUES

Despite the widely shared view that environmental degradation and climate change will contribute to increased population movements over the coming decades, there is little consensus on the definition of those persons currently or likely to be on the move. Persisting definitional debates are in turn challenging academics, policymakers and practitioners as they seek greater coordination in order to more effectively manage the migratory causes and consequences of environmental change. Seminar participants sought to help narrow these debates by clarifying some of the key issues in question and their definitional implications.

Part of the controversy stems from the fact that those who migrate partly or wholly for environmental reasons span a large continuum – from those who are suddenly displaced by an extreme environmental event to those who pre-emptively migrate due to deteriorating environmental conditions. While most of these migrants remain within their countries of origin, some cross international borders. Similarly, some migrate temporarily and others permanently.

A further challenge is to reconcile divergent views as to whether or not it is feasible to differentiate a direct from an indirect association between migration and environmental change, particularly where this change is gradual. Participants discussed a host of economic, social, cultural and political factors that can strengthen or weaken the association between environmental change and migration. Population growth, poverty and governance, for instance, play a strong role in shaping the migratory outcomes of environmental change. In the words of one participant, these factors affect the “caring capacity” of the social

system, understood as the capacity of local institutions to adapt to any changes in the “carrying capacity” of the ecosystem.

As illustrated throughout this report, socio-economic differences within a community also have an impact on whether or not migration factors into a household’s strategy to cope with environmental change as well as the extent to which such migration is planned or forced. Resulting migration flows can therefore be mixed – comprised of both environmental migrants as well as those more traditionally referred to as “economic” migrants. Such flows may also lose their association with environmental change over time. What might be considered, for instance, as environmentally induced rural-to-urban migration can evolve into cross-border labour migration. At present, data collection tools do not typically differentiate between such subtleties.

Given these nuances, conflicting views persist on the policy and legal implications of the environment-migration nexus and on how such implications should, if at all, be captured in a common definition. Existing international instruments, such as the 1951 Refugee Convention, do not cover the issue of environmentally induced migration. The Guiding Principles on Internal Displacement, while relevant to addressing internal population movements resulting from natural disasters, is not intended to address cross-border displacement.

Taking into account these definitional issues and challenges, participants put forth several possible definitions, some rather all encompassing, others less so.

One proposal called for distinguishing among three categories of environmental migrants:

- *Environmentally motivated migrants* were characterized as those who “pre-empt the worst” by leaving before environmental degradation results in the devastation of their livelihoods and communities. These individuals may leave a deteriorating environment that could be rehabilitated with proper policy and effort. These migrants are often seen as economic migrants, and their movement may be either temporary or permanent.



- *Environmentally forced migrants* were defined as those who are “avoiding the worst.” These individuals have to leave due to a loss of livelihood, and their displacement is mainly permanent. Examples include displacement or migration due to sea level rise or loss of topsoil.
- *Environmental refugees* were described as disaster refugees or those who are “fleeing the worst.” These individuals are often fleeing immediate devastation not only of livelihoods, but of lives. Their displacement can be temporary or permanent.

Participants also discussed the alternative approach of employing a more all-inclusive definition. One working definition elaborated by IOM reads as follows:

*“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.”*

Such a broad definition may enable policymakers and practitioners to better focus on collective responsibility and joint solutions. This working definition does not exclude the possibility that sub-definitions may evolve in alignment with any new developments in international law.



# **SOME CRITICAL DIMENSIONS OF THE MIGRATION AND ENVIRONMENT NEXUS**

Four important dimensions of the migration and the environment nexus were discussed during the seminar: (1) the impact of gradual environmental change on migration; (2) the impact of extreme environmental events on migration; (3) the impact of migration on the environment; and (4) the interaction of these phenomena with the potential for conflict.

In exchanging their findings, participants acknowledged that some of the assumptions shared may not be fully grounded in scientific research, due to the paucity of reliable data in this field. This said, participants emphasized the need to balance further research with the imperative of immediate action.

## **The Impact of Gradual Environmental Change on Migration**

Although extreme environmental events, such as natural or industrial disasters, are more likely to result in sudden, massive population displacement, participants estimated that a larger number of people overall are migrating due to a gradual deterioration of environmental conditions and anthropogenic, or man-made, climate change and its effects. Gradual environmental changes, such as desertification, land degradation and deforestation can be understood as those changes that occur slowly over a long period with small yet cumulative manifestations. In some cases,

there is a threshold after which these phenomena can become irreversible.

The most discussed example of late is that of sea-level rise. According to research cited at the seminar, approximately 44 per cent of the world's population lives within 150 kilometres of the coast, with some areas more densely populated than others. In practical terms, it was noted that a rise in sea level of 10 centimetres could result in the flooding of most of Bangladesh and the complete submersion of many small island states in Asia and the Asia Pacific.

Speaking more broadly of gradual environmental change, participants discussed the findings of the Millennium Ecosystem Assessment (MA) finalized in 2005 upon the request of former UN Secretary General Kofi Annan. Fifteen of 24 ecosystems were found by this assessment to be degraded or utilized in an unsustainable way. In more detailed figures, 70 per cent of the 5.2 billion hectares of dryland used for agriculture are said to be degraded, while desertification is amounting to an estimated global economic loss of USD 975 million per year.

If one looks at Africa alone, desertification is engulfing ever larger areas of the Sahel region, due in part to climate variability in the form of *aridification*, or decreased rainfall and extended periods of drought. The effects on human security are dire. Many communities in the Sahel are directly dependent on the land for agriculture or pastoralism, leaving them highly vulnerable to decreased food security and income in the face of desertification.

Taking another example of gradual environmental change, namely the thawing of the permafrost around the arctic pole and the increasing mudslides in nearby areas, participants discussed the inability of many Inuit members to rely on traditional means of livelihood. The threat posed by the melting of the Himalayan glaciers was also explored. Should such melting continue, participants estimated that up to one billion people in South Asia could face a critical shortage of freshwater.

As illustrated, with the exception of the more indiscriminate effects of sea-level rise, gradual forms of environmental change may most acutely affect those who depend directly on fragile ecosystems to sustain small-scale farming, fishing, livestock herding, related wage labour and similar livelihoods. One participant pointed to studies indicating that global temperature rises of just 2 to 3°C will contribute to lower crop yields in agriculturally rich regions of Africa, Western and South Asia by as much as 30 to 40 per cent. As fragile or degraded ecosystems are less and less able to sustain resident populations, communities endeavor to adapt through a variety of measures, including migration, whether or not such movement is viewed upon favourably.

The larger share of this migration may well be internal, as migrants move to more arable regions or fishable coastal areas within their country. In Latin America where considerable migration has been attributed in part to the desertification of previously arable land, affected populations such as those in the northeast regions of Brazil and Argentina were found by a participant to migrate predominantly to the state capitals and the south-central regions of their respective countries. In Chile, Mexico, Ecuador, Bolivia, Peru, the Dominican Republic, and Haiti, many migrants may similarly move from degraded areas to primary urban centres and provincial, state and national capitals.

Gradual environmental change also contributes to international migration flows. According to one participant, many of the Ecuadorian migrants living in Spain, among other countries of destination, are likely to originate from poor, environmentally degraded areas. Other participants spoke of migration flows from El Salvador to the United States and Mexico and the degree to which these flows are fuelled by large-scale deforestation in El Salvador. Returning to the issue of sea-level rise, participants anticipated that a metre rise in sea level could result in the movement of millions of people, and not only from south to north but also within and among northern states, due to the coastal locations of many northern urban centres.

Both internal and international environmentally induced migration can often take the form of temporary or seasonal, rather than permanent, flows as migrants seek to diversify their

risks against declining local earning capacity without altogether severing their economic ties with the home community. In some cases, entire households will migrate on a short-term basis as they wait for environmental conditions to improve in their area of origin. In other situations, some household members will migrate while the others stay behind to care for local assets and livelihood means. Participants raised the examples of seasonal migrants circulating between northeast and central Thailand and between Mexico and the United States and Canada, remitting home to sustain basic standards of living that are affected by land degradation.

Where temporary migration is not feasible or where situations of environmental degradation and drought are particularly protracted or irreversible, migration can become permanent. Without improved management planning, migration in these instances can also be largely irregular.

Whether or not households turn to migration as a coping strategy and what form and duration this migration assumes can be explained partly by factors that are: *economic* – e.g. differences in available financial resources, security of land tenure, in transport/relocation costs and in host area employment opportunities; *social* – e.g. family composition, age, availability of networks to facilitate relocation, level of social mobility and educational attainment; and *cultural* – e.g. differences in the cultural costs of moving.

Predicting the exact nature of migration patterns in relation to gradual deterioration in environmental conditions is complicated by these factors and how they interact at the individual, household, community and national levels. One certainty is that the poor and less skilled have fewer options in developing their coping strategy. The better-off and highly skilled may be best positioned to migrate. At the same time, the more affluent may also be more able to sustain and recover from environmental shocks without moving. The poor and less skilled, in contrast, are typically doubly disadvantaged. Not only do they frequently lack the (informal or formal) insurance to overcome environmental shocks, but they are also likely to face greater obstacles to internal and international labour mobility.

An additional issue raised during the seminar was that of migrant health. In parts of the Amazon, participants noted that deforestation, mining and well contamination has led to mercury contamination of fish, contributing to adverse health outcomes among the residual communities and those migrating in search of improved livelihood options.

### *Intermediating Manmade Factors*

In exploring the types of gradual environmental change that contribute to increased migration flows, participants acknowledged the need to take into account a range of human activities that can accelerate environmental change. Addressing one or more of these factors can reduce migration propensity among affected households.

One such factor includes the nature of land distribution and tenure. In some parts of the world, traditional forms of collective land rights have enabled sustainable forms of grazing and farming. In other cases, participants cautioned that access to land may be inequitable, leading some groups to overgraze or overfarm to the detriment of the environment.

Demographics can present a further complication. As populations grow exponentially, residents can place undo strain on fragile ecosystems through unsustainable livelihood practices. Fishing grounds can become depleted and once viable farm plots inefficiently subdivided among growing numbers of descendents.

In addition to questions of land distribution, tenure and demographics, some forms of resource-use may cause more environmental degradation than do others. According to a participant, inappropriate agricultural techniques, deforestation and overexploitation of vegetation for domestic use, have led to wind- and water-induced erosion in many countries, including Togo, Malaysia, Honduras, Costa Rica, and Island States of the Caribbean. The practice of overgrazing was also cited as a dominant cause of land and soil degradation in numerous

developing countries, particularly in the Sahel region of Africa, but also in more developed areas, such as Australia and the western region of the United States.

Poverty was discussed as yet another critical contributing factor in environmental degradation. Participants noted that in Latin America and the Caribbean, poor small-scale producers tend to live in degraded areas with marginal plots of land and little freshwater. To cope with these challenges many have overexploited the land, fuelling a downward spiral of more degradation and more poverty.

Attempts to improve irrigation can also have adverse environmental outcomes. A case in point raised during the seminar involves a policy instituted by the former Soviet Union to irrigate cotton with water from the Aral Sea. As the irrigation system was inadequately managed, water levels in the Aral Sea dropped precipitously, exposing large areas of dry sea bed. Wind has since carried saline soil to nearby populated areas, contributing to health problems, environmental degradation and migration. The reduction in water availability has at the same time lowered outputs from agriculture and the local economy.

Referring more broadly to large-scale development projects, participants noted the potential for substantial and adverse environmental repercussions where such projects are unsustainably managed. Mega-hydrologic projects, river channel diversions and resultant siltation, and expansion of agricultural and aquaculture practices in marginal areas were among the examples cited. Some of these projects are carried out in environmentally vulnerable areas, such as those prone to natural disasters like earthquakes. Others may not be accompanied by the institution of costly and long-term safeguards. The potential environmental consequences of such projects may be experienced by neighboring States, when vital cross-border rivers are diverted or other common resources affected.

Another manmade factor that affects the environment through biological degradation is industrial pollution. Toxic waste, acid rainfall and other forms of pollution were highlighted as



contributing factors to environmental degradation in areas such as Europe and Côte d'Ivoire, among others.

Looking beyond local and national initiatives that affect environmental change, participants also discussed the role of globalization, and particularly in the context of international trade. Some raised the potential of certain trade agreements, by rapidly opening domestic markets to competition with cheaper foreign produce, to conceivably exacerbate drops in income among local farmers with declining yields due to land degradation or drought. One participant explained that as global trade has reduced the viability of the local sugar industry in the Mauritius, the State has decided to begin phasing out this industry, which could increase the propensity for migration among the newly unemployed until such time as alternative local industries can compensate for the loss in jobs. The migratory implications of various global trade patterns have also been explored in a seminar on "Trade and Migration" organized in Geneva, Switzerland in November 2003 by IOM, the Organization for Economic Co-operation and Development (OECD) and the World Bank.

Participants also noted that national efforts to attract foreign direct investment can impact upon the association between the environment and migration. One participant explained that Indian state administrations looking to set up special economic zones have been encouraged to consider the potential migratory repercussions of diverting otherwise fertile land from local farmers.

## **The Impact of Extreme Environmental Events on Migration**

The term "extreme environmental event" is understood to refer to any disaster that is likely to affect a sizeable population over a large region and whose effects are experienced immediately by the surrounding community. Extreme environmental events receive a considerable amount of media attention due to the mass human displacement and widespread destruction that can occur. Some examples of extreme environmental events include hurricanes,

cyclones, tsunamis, coastal and riverbank flooding, earthquakes and volcanic eruptions.

According to one participant, normative definitions of extreme environmental events are typically constructed in relation to the normalized distribution of rainfall and temperatures, such that an “extreme” event is one that falls between two to three standard deviations away from a normal distribution. As gradual climate change accelerates and average temperatures and precipitation patterns change, what is considered as “extreme” is also likely to change. Rather than defining an extreme environmental event in normative terms, this participant opined that it may be more useful for policymakers to define extreme environmental events as those events for which emergency preparedness plans are required.

While extreme environmental events appear to be instantaneous and unpredictable, participants acknowledged that these events, when viewed over the long term, tend to follow a certain periodicity, or interval length between occurrences. However, with events such as tsunamis, it was argued that this periodicity, in some areas, has traditionally been so great that communities have no recorded or *de facto* experience with how best to respond. This may change, however, if climate change shortens periodicities, contributing to more extreme events (and of greater magnitude) in the coming decades.

Turning to the issue of migratory outcomes, participants largely concurred that the majority of displacement associated with extreme environmental events has been internal. However, as opposed to the incremental increase in migration often observed in relation to gradual environmental change, the displacement following an extreme environmental event is more likely to be sudden and collective. In one illustration, participants noted that an estimated 1 million Bangladeshis are displaced annually – and mainly to urban centres – due to flooding and subsequent river bank erosion. Taking another example it was argued that the dust and sandstorms in Northeastern Asia displace millions of people and result in economic losses amounting to millions of US dollars.

Due in large part to the sudden nature of their displacement, populations affected by extreme environmental disasters may be relatively more vulnerable to whole-scale deprivation and exploitation.

In further contrast to migration induced by gradual environmental change that is irreversible or nearly so, victims of extreme environmental events are said to be more likely to be displaced in the short- rather than long-term, as returns to the disaster site are often possible. However, the sustainability of returns may be compromised where reintegration means are inadequate, leaving returnees prone to engaging in secondary population movement. In Thailand, numerous shrimp farmers were said by one participant to have lost their livelihoods as a result of the Tsunami; lacking the means to buy new equipment and start anew, many have migrated in search of better economic prospects.

In other instances, returns may not be sustainable if the area of return has suffered long-term environmental damage or is at continued risk of disaster. In such situations, displacement can become protracted or permanent. This has been the case in some tsunami-prone areas of Sri Lanka, where the government prohibited resettlement by those initially displaced by the 2005 Tsunami.

Similar situations can arise after the aforementioned dust and sandstorms in Northeastern Asia, particularly in Inner Mongolia and China. Severe dust storms were noted to affect approximately half of the provinces in China. According to one participant, one dust storm with strong winds recorded on 5 May 1993, in a small oasis county west of the Gansu Province, is known to have lasted for 24 hours. Although this dust storm affected a relatively small region with a population of 230,000, the direct economic loss due to the event is said to have totaled 256,000,000 Yuan. In more detail, the participant noted that 170,000 hectares of crop fields were destroyed, as were more than 40,000 houses, 66,700 cattle and sheep, and 27,000 hectares of plastic greenhouse used to cultivate vegetables and cash crops in the arid zone. Due to this near total loss in livelihood means, many inhabitants displaced from the area were eventually unable or unwilling to return.

As with the above discussion on household exposure to gradual environmental shocks, participants underlined that vulnerability to loss of life and livelihood during a natural or industrial disaster is partly determined by one's income quintile, among other expressions of poverty. One study cited suggests that an average of 3,000 deaths occur per extreme environmental event in less developed countries in stark contrast to the less than 400 deaths per event observed by the study on average in middle and high income countries.

Whether or not affected populations are displaced over the long term or opt to migrate permanently is also a function of other economic, social or cultural determinants. This is thought to be the case in Bangladesh where a participant acknowledged that a causal link has been established between poverty, local displacement of population and temporary or permanent labour migration associated with environmental degradation induced by river flooding. The situation of Bangladeshis displaced or otherwise affected by monsoons is said to be exacerbated by the post-monsoon rise in unemployment and food shortages during the gap between major paddy harvesting periods. Known as "Monga syndrome"<sup>2</sup>, such livelihood challenges may affect nearly two million people in the country's Northwest districts. Among the affected residents, many can be observed migrating temporarily to urban centres.

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<sup>2</sup> Footnote based on speaker presentation: "*Monga*, "or "crisis" refers to the temporary food shortages that prevail in the northwestern districts of Bangladesh almost every year between October and the end of November, a period roughly corresponding to the month of Kartik in the Bangla calendar. For many of the poor landless wage-labourers and farmers, this period constitutes a gap in employment between the harvesting of the "Aus" and "Aman" paddies. During this time, unemployment is said to rise precipitously, and food shortages to affected upwards of 2 million persons, leading many to refer to the challenges of this period as the "Monga syndrome." During the "Monga," a large portion of the affected population migrates temporarily to surrounding urban centres.

## *Associations between Gradual and Sudden Environmental Change*

During the seminar, participants underscored that gradual environmental degradation can substantially increase the vulnerability of a region to extreme environmental events. For instance, where natural landslides are exacerbated by human activities, such as deforestation, inappropriate cultivation means and industrial constructions, surrounding areas are said to be at heightened risk of natural disaster. Nepal, which experiences as many as 12,000 landslides per year, may be a case in point.

Also illustrative of this association between gradual and sudden environmental change are the findings of a 2004 Tsunami damage assessment (released in 2005) raised during the seminar. According to this assessment, significantly more damage to lives and livelihoods was found to be sustained during the Tsunami in areas where the ecosystems, especially sand dunes, mangroves and coral reefs, had previously experienced gradual ecological deteriorations. The loss of mangroves and coral reefs that would otherwise protect against flooding, for instance, has rendered certain regions more exposed to extreme environmental events. Some coastal and riverbank areas have similarly become more prone to flooding as they lose other natural flood or water-retention areas due to resource exploitation and unsustainable agricultural practices. In addition, the water shortages that typically accompany floods in Southeast Asia will increasingly be compounded by the more gradual melting of the Himalayan glaciers.

In some cases, participants noted that gradual environmental changes, including long-term droughts and increased salinity of freshwater sources, can in and of themselves constitute a “disaster” for human security, depending on their intensity and the size of the population and area affected.

## **The Impact of Migration on the Environment**

As emphasized throughout the seminar, not only does environmental change impact upon migration, but migration itself can impact considerably upon the environment both in the places people are migrating to and the places from which they migrate.

### *Impacts of Migration in Areas of Destination*

#### **Urbanization**

As discussed above, participants estimated that much of the migration from environmentally degraded areas in regions such as Latin America tends to flow toward urban centres, be they key cities, provincial, state or national capitals. In Bolivia, rural inhabitants affected by desertification have moved in sufficiently large numbers – totaling approximating 1.5 million – to compose almost the entire population of the city of El Alto, according to a participant. Lima, Peru has also grown exponentially due in part to the inflow of environmental migrants and is now joining the ranks of the world’s megacities.<sup>3</sup>

Stepping back, one finds that the world’s urban population is likely to shortly outnumber that in rural areas. Not all of this growth will occur in megacities; as the term “urban”, depending on the definition employed in a given census, can refer to a centre with a population of as little as 2,000.

Notwithstanding the need for greater research, urbanization has historically been viewed as an irreversible phenomenon, which contributes to economic and human development. Migrant remittances, or financial transfers, to rural areas of origin can constitute an important social safety net and income source for vulnerable households. However, much urbanization has occurred with such break-neck speed and weak management that it has raised several concerns, not least of which is the detrimental

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<sup>3</sup> Megacities are metropolitan areas with more than ten million inhabitants.

impact on the environment. This is particularly relevant in cases of inadequate management of migration flows to big cities.

Participants underlined that a migrant's environmental "footprint" can be greater when living in the city due to differing production and consumption patterns, thereby straining urban infrastructure and services as well as the food production capacity and freshwater resources of surrounding rural areas. Ineffective urban planning to meet such migrant inflows and unchecked development exacerbates this situation.

In the absence of adequate eco-friendly water management and public transportation systems to address the needs of growing rural-to-urban migration, both water sources and air quality risk being polluted. In India, where one participant anticipated that over half of the country's population will be urban by 2025, unregulated housing construction has in some cases interfered with natural streams, causing water sources to dry up. Subsequent residential and commercial development in these areas has heightened the likelihood of floods – and infrastructure collapse – as rainwater has less scope to recede.

India's situation is by no means unique. The inadequate absorptive capacity of many of the world's cities has contributed to a situation in which rural-to-urban migrants are often left to overexploit or pollute natural resources to meet their basic needs. Many end up settling in – and possibly deforesting – marginal areas such as floodplains, low-lying riverbanks and poorly safeguarded industrial zones that are prone to disaster. These coping measures of marginalized migrant communities can increase the likelihood and devastation toll of disasters, including floods and landslides, among others.

### **Environmental Effects of Mass Population Displacement**

Situations of mass human displacement, if inadequately managed, can also accelerate environmental degradation. According to one participant, those evacuated from the centre of Mexico City during the 1985 earthquake subsequently moved to the outskirts of the city; areas that lacked services such as water drainage or sanitation systems. Subsequent alterations to land

use associated with the inflow of displaced persons were cited as having contributed to marked environmental damage over the ensuing decade, rendering previously unaffected neighbourhoods prone to flooding.

Similar situations have arisen following natural disasters and conflicts where camps for internally displaced persons or refugees have been set up in ecologically vulnerable areas. Inappropriate camp management can result in overexploited groundwater, for instance, or in the deforestation and degradation of surrounding land, as the displaced undertake intensive collection of wood for cooking fuel, or fodder for their livestock, within limited areas.

### *Impacts of Migration in Areas of Origin*

#### **Out-migration, Return Migration and Environmental Protection**

Participants also called attention to the environmental impact of outward migration on areas of origin. By lessening demographic pressures, outward migratory flows may help some areas to recover from environmental degradation, thus permitting for eventual migrant returns. But in cases of severe degradation, many years may be required for the rejuvenation of fallow land. This timeframe can conceivably be shortened where governments assist in the active reversal of some of the damage to these areas.

The phenomenon of migrant remittances was raised during the seminar as another possible benefit of migration for the environment of areas of origin. In the best-case scenario, remittances can help finance initiatives for sustainable natural resource management in the migrant's community of origin. In Burkina Faso, villages experiencing a cycle of poverty and environmental degradation are said to have collectively invested to send numerous household members to the relatively more prosperous Côte d'Ivoire to work on plantations, open small shops and remit money home. Remittances were in turn invested not only in the construction of hospitals and schools, but also in the development of important water systems and irrigation systems.



According to a participant, the disruption to such remittance flows and the added demographic pressures on the environment and local economy associated with the sudden return of 750,000 migrants following political instability in Côte d'Ivoire in 1999, only underscored the value of migration as a coping strategy for these villages in Burkina Faso. Many inhabitants have therefore returned to Côte d'Ivoire or have migrated, often irregularly, to Europe.

In addition to benefiting their home communities through remittances, migrants may return temporarily or permanently with the knowledge of more sustainable land use techniques. In Northeast Thailand, one participant noted that there was an observable change in land use following the migration and return migration of local inhabitants. Returning migrants have employed their foreign acquired skills, knowledge and financial savings to assist farmers to forego mono-cropping in favour of integrated farming. More sustainable land management has in turn helped to protect the environment in dry regions of Northeast Thailand where the earlier deterioration in environmental conditions had been partially attributed to inappropriate land use, including through cassava cultivation.

More established diasporas are also known to send financial, technical and human resources to assist communities devastated by natural disasters. Following the Indian Ocean Tsunami, numerous professional members of the Indian diaspora, especially those with medical and counselling skills, returned to affected areas to assist in post-disaster administration and relief, thereby helping to avert some of the aforementioned risks to the environment in areas of displacement.

The above benefits notwithstanding, out-migration may, in certain cases, leave areas without the necessary human capital to combat further environmental degradation. This may particularly be the case in situations of mass permanent migration-especially of those most skilled in sustainable natural resource management-where the migrants retain little if any contact with their communities of origin.

## **Migration, Environmental Change and Security**

The two-way association between migration and environmental change discussed above can also affect, and be affected by, security. This may be particularly pertinent in semi-arid areas of weak governance and relative poverty.

Referring to the ongoing conflict in Darfur, participants discussed the role of climate change in altering vegetation and rainfall patterns. In particular, the decline in average rainfall and deterioration in land use is exacerbating desertification, land degradation and deforestation, thereby heightening the impact of recurrent droughts on local communities and contributing to tension between semi-nomadic pastoralists and farmers, among others, over reductions in pastures, arable soil and freshwater. Where traditional dispute settlement mechanisms fail to cope with such challenges, this tension is likely to rise. The risk of such tension and violence spilling across borders is of further concern.

The human displacement associated with the conflict in Darfur has meanwhile contributed to environmental degradation, in many of the ways discussed in the above sub-section on "*Environmental Effects of Mass Population Displacement.*"

While environmental change is only one of several contributing factors to the Darfur conflict, it is nonetheless one that has captured significant attention of late.

# **IMPROVING DATA AND RESEARCH FOR INFORMED POLICYMAKING AND ACTION**

To address the above dimensions to migration and environmental change, seminar participants concurred on the need for better data and assessment tools.

## **Reviewing Existing Estimates**

At the moment, effective policymaking is often hampered by widely divergent estimates of population movements occurring or likely to occur in part or in whole due to gradual or sudden forms of environmental change. Moreover, these estimates may not be locally specific but rather global, regional or national in character.

Leaving the issue of environmental change aside, migration statistics alone are often in need of improvement in order to capture internal, temporary, circular or staged movements, as well as those conducted irregularly. One participant reflected that in Senegal – laudably the first country in western Africa to set up an observatory system on migration flows – data is collected mainly on cross-border movements and border control operations with little inquiry as to the motivations underlying migration.

Urban planners often lack critical data on the population inflows they might expect to see from the countryside or from

abroad. Census data, typically collected at lengthy intervals, may only illustrate total urban population growth.

Aggregating and comparing migration data across countries has also proven problematic. National data on migration flows may be derived from different sources and according to varying definitions and objectives. Data on remittances, and particularly on those transfers made through informal channels, could also be improved upon.

Quantifying current or predicted migration flows driven partially or fully by environmental degradation or natural disasters is all the more problematic as touched upon below.

## **Some Considerations on Methodology**

### *Assessing Levels and Drivers of Environmental Migration*

To date, there is relatively greater consensus, albeit one still masking highly divergent numerical estimates, on the size of population movements that one might expect to see in relation to extreme environmental events as opposed to gradual environmental change. The one exception may be that of sea level rise. Scientific modelling, for instance, can indicate which areas will become uninhabitable should the sea level rise up to one metre, thus affording a rough estimate of the potential migratory flows.

The link between environmental change and migration in cases of sea-level rise and natural or industrial disasters is arguably more direct and less subject to conflicting assessments of the relative role of intermediating social, economic or political factors. In contrast, identifying the comparative function of environmental change, from among other factors, as a primary or significant driver of migration is more challenging where environmental change occurs gradually.

Efforts to predict the magnitude of migration flows that are attributable in some manner or another to desertification, land degradation or deforestation, for instance, have proven more difficult, with their outcomes subject to greater controversy. Below are a few of the methodological questions giving rise to such debate on the role of environmental change in the migration decision-making process.

In order to obtain more accurate estimates of environmental migration, seminar participants emphasized that existing scientific models to predict environmental changes, such as the rate and location of desertification, need to be complemented by more targeted research to identify the social, economic and political factors that can make some individuals, households and communities more likely than others to migrate or be displaced during various situations of environmental change.

Such vulnerability mapping could encompass local assessments of both the “carrying capacity” of the environment as well as the “caring capacity” of local institutions, as explained by one participant.

### **Carrying Capacity**

The carrying capacity of an ecosystem was said to refer to the ability of ecosystem services to support basic standards of living among the population. Assessing carrying capacity entails estimating the likelihood that an ecosystem will be negatively exposed to climate variability. Some participants added that such assessments should also take into account high population growth rates that can compromise the carrying capacity of the ecosystem.

### **Caring Capacity**

Caring capacity was explained as the ability of formal and informal institutions to sustainably manage natural resources in the face of deteriorating environmental conditions. For example, one participant noted that in Mopti, Mali, the decision by some community leaders to award commercial trawlers the right to fish

in depleted waters is seen to have reduced the adaptive capacity of the society as a whole. In other cases, socio-cultural traditions of stock-piling food, diversifying income sources or extending community credit to vulnerable households, can strengthen communal adaptive capacity.

The term caring capacity also refers to the ability of local institutions, including informal community-based arbitration systems, to mediate disputes over increasing scarcity of resources or the trade-offs involved in addressing this scarcity at the community level. The ability and willingness of local institutions to employ these and other adaptation means will affect a community's relative vulnerability to gradual and sudden forms of environmental change.

### **Individual and Household Vulnerability**

Understanding the interplay between carrying and caring capacities can tell us more about the vulnerability of a given "socio-ecosystem" and allow us to better assess an individual's likelihood to migrate or be displaced during or following environmental change, bearing in mind his or her place within this socio-ecosystem.

A household or individual's vulnerability within a given socio-ecosystem can be mediated by several factors, including his/her respective level of income, assets and social development. As discussed earlier on in this report, the poor are generally more vulnerable to adverse outcomes associated with environmental change and tend to have fewer options for effective local adaptation. They may therefore be the first to migrate, provided that they have the minimum resources to do so and that they can expect to find their basic needs met upon arrival. Temporary or permanent internal or cross-border migration may be viewed as an effective means of compensating for declining earning capacity, food and water security due to environmental change. However, one participant cautioned that some communities may consider migration to be an adaptation strategy of last resort, as was found through a study in select communities of the Sahel region of Africa.

Issues of age and social structure also account for relative vulnerability as was evident during the 2003 heat wave in Europe. According to one seminar participant, many of the estimated 30,000 deaths during this period occurred among the elderly that lived alone and/or lacked strong social networks. The elderly may also be less able to avail of migration as an adaptation strategy. The example of Hurricane Katrina in New Orleans was also raised to illustrate these vulnerability factors. Following this disaster, certain communities were believed to exhibit a stronger tradition of self-help, making for less protracted situations of displacement.

Issues of gender also require greater consideration. Male youth, for instance, may be the first to migrate in situations of gradual environmental degradation, leaving women to care for the residual means of livelihood. Other noteworthy distinctions exist. The handicapped as well as those lacking strong social networks, such as orphans and the elderly in certain communities, may be duly disadvantaged when it comes to engaging in “fight or flight.” Indigenous groups can find themselves outside of the decision-making process: and decision-makers bereft of what may be critical local knowledge on how best to adapt to environmental change. These are but a few of the issues that, if effectively accounted for in research, can make for more effective initiatives.

### **Migration as an Adaptation or Coping Strategy**

Participants concurred that vulnerability mapping is most likely to accurately identify or predict instances where migration constitutes a main strategy to cope with environmental change when all of the above factors are considered, namely: the carrying capacity of the ecosystem; the caring capacity of local institutions; the socio-economic vulnerability of households and individuals; and preferences for “flight or fight.” This type of vulnerability mapping could assist policymakers in more effectively predicting and managing environmental migration.

Moreover, such a comprehensive assessment approach lends itself to more effectively determining the relative importance of environmental change, versus other socio-economic factors,

as a present or future driver of migration. With such findings at their disposal, policymakers and practitioners would be better positioned to pinpoint the most appropriate sectors for intervention as a complement to migration management.

### *Assessing the Relative Impacts of Migration on the Environment*

Assessing the various migration impacts and trade-offs in relation to environmental change and adaptive capacity in the areas of origin and destination for migration will also be important in managing migration to the benefit of all and the environment. However, several improvements in research are required for this purpose.

In reference to areas of origin, for instance, one participant highlighted the challenges in discerning the net impact of outward migration and remittances on the environment of Kerala, India. In Kerala, remittances from migrants in the Middle East are said to serve as the primary funding source for local development, contributing not only to the state's relatively promising human development indicators, but also to the financial feasibility of various local strategies to adapt to environmental degradation. Outward migration is also viewed upon favourably for having reduced population pressure on the environment.

However, some are questioning whether remittances to Kerala, by contributing to increased consumption, may also be expanding the "environmental footprint" of the families remaining behind. While not in reference to Kerala, other participants raised the potential for outward migration to weaken the social structures of some communities of origin and thereby diminish the latter's capacity to adapt to environmental change.

When speaking of areas of destination for migrants, there is a similar need for improved research regarding the net impact of different migration flows and migration management schemes on the environment of urban areas and their surroundings.



As various parties seek to predict the impact of future migration flows on the environmental health of our cities, one participant cautioned against overlooking the potential impact of science and technology. Just as scientific innovation has belied speculation that all urbanization will lead to mass food insecurity – as evidence to the contrary, the Netherlands and United States are two of the world’s largest food surplus producers despite the fact that only five per cent of their respective populations is estimated to live in rural areas – so too may it render the above environmental concerns overstated.

However, facilitating technological improvements in eco-friendly infrastructure and services nonetheless necessitates more accurate and systematic assessments of the numbers and needs involved in rural-to-urban migration. On the particular issue of migrant needs, for example, it would help to understand whether the majority of migrant inflows are temporary or circular rather than permanent.

Also in reference to areas of destination, environmental assessments are increasingly being conducted in conjunction with the development of plans to shelter and assist displaced persons and to support their sustainable return.

### *Some Common Issues in Data Collection, Scale and Aggregation*

Participants concurred that effectively approaching the above research issues as well as monitoring and evaluating policy responses requires, above all, a more interdisciplinary approach. In terms of research tools, participants valued a variety of quantitative and qualitative survey instruments. However, many cautioned that a range of challenges remain to be overcome, including issues of scale, which were said to arise in comparing aggregated environmental data with disaggregated social data.

Other issues raised during the seminar include those of scale, micro-macro aggregation, time frame, administrative overlay and

data sharing. On the last point, a participant emphasized that ensuring the transmission of data collected at local and provincial levels to the central government can considerably ease national policymaking. China, for instance, was cited as an example where the effective sharing of scientific information by local irrigation and forestry services has enabled the Chinese central government to elaborate and fund more targeted programs to combat desertification and soil degradation.

# **POSSIBLE POLICY RESPONSES AND INTERVENTIONS**

Seminar participants discussed a wide range of policies and actions that could assist in addressing the various dimensions of the association between environmental change, migration and conflict. While some of the policies discussed below seek to account for intermediating social, political and economic factors, others do not given the limitations of the focus and timeframe of the seminar.

## **Stabilizing Communities Prone to Environmental Degradation**

Throughout the seminar, participants emphasized that, where possible, community stabilization initiatives should be supported to mitigate the propensity for migration.

Community stabilization here refers to a wide range of measures to combat the natural or man-made deterioration in environmental conditions and to assist communities in adapting to such change. In some cases, States may directly finance tree plantations, or in the case of the Brazilian government, undertake water harvesting and redistribution programs.

In other cases, governments have provided inhabitants in vulnerable areas with incentives to adopt more sustainable practices in natural resource management. Various examples

were cited of States supporting their residents in retaining or regenerating soil cover and reforesting affected areas. A case in point raised during the seminar was that of Niger. Having attributed deforestation in part to the lack of incentive among farmers to protect trees that were considered to be State property, the government of Niger moved to privatize trees. The rate of deforestation is said to have fallen considerably as farmers are now able to use the bark, fruits and other products associated with the trees under their conservation. In El Salvador, where the widespread use of lumber for cooking fuel has contributed to mass deforestation, the government has subsidized the development of solar powered cooking devices and distributed them to targeted households.

Participants also noted that residents may reduce recourse to overgrazing if supported in changing their animal husbandry practices. Governments can help residents, for instance, to exchange many low-quality livestock for smaller numbers of more productive breeds.

Incentives can also take the form of direct income support to compensate for reduced agricultural yields or animal husbandry profits associated-at least in the short-term-with engaging in more sustainable land management. In 2001, the central Chinese government began a “green for green” policy, according to one seminar participant. This policy foresaw financial and food support for the settlement of semi-nomadic herders and farmers. In so doing, it has helped to reduce soil-degrading agriculture and free grazing. In some cases, even retirement programs such as that in Northeast Brazil have been designed to reduce recourse to unsustainable land use practices.

Participants also emphasized the importance of improving land distribution and tenure systems in order to address land scarcity or landlessness as a cause of manmade environmental degradation. In some instances, this could mean facilitating access by youth to affordable land plots and complementary micro-credit support.

In combination, changes in land distribution and tenure and targeted subsidy programs are said to have assisted various rural communities in Brazil, Chile and Mexico in combating

environmental degradation and in thereby avoiding the use of migration as a coping strategy. Such initiatives, however, can encounter a variety of obstacles.

Oftentimes, what looks good on paper may encounter unanticipated challenges in implementation. One such example raised during the seminar was that of a World Bank financed reforestation initiative in Northeast China. As part of this initiative, farmers were provided with grants for the purpose of planting trees. However, many farmers alternatively used these grants to purchase goats, which further diminished vegetation and degraded the land. This experience illustrates the importance of ensuring community involvement in project development and of continuously raising public awareness of project objectives.

Cost is another potentially inhibitive factor. One participant cited an estimate by the United Nations Environment Programme (UNEP) that effectively restoring the degraded land of the Latin America and Caribbean region would require an investment of up to USD 13 billion.

In spite of the above challenges, national and regional initiatives continue to move forward. Participants discussed two examples in particular. The first, known as the Permanent Interstate Committee for Drought Control in the Sahel (CILSS), is said to be making important advances in the fight to control desertification and drought in the Sahel. The second involves a regional master plan developed by the Asian Development Bank and its partners in order to address devastating sandstorms in Northeast Asia. Each party to this plan is welcome to contribute according to its interests. From Mongolia, to Korea to Japan, interest in this cooperative initiative is growing and so far, the program is said to be doing well.

## **Integrating Trade Issues into Community Stabilization**

Participants highlighted that effectively combating the deterioration in environmental conditions requires integrating

considerations of international trade and development into community stabilization planning. Doing so might entail addressing critical economic trade-offs as were seen in the earlier discussion on the loss of global coffee market shares by Guatemala to Vietnam. Also raised during the seminar is the predicament faced by some States with rapidly depleting fisheries as they negotiate trade-offs between selling access to their fisheries to foreign fleets and sustaining fish stocks to ensure the livelihood of local fisherman as an alternative to outward migration. These are but a few examples that demonstrate the value of bringing trade experts into the discussion on environmental change, development and migration.

### **Facilitating International Migration and Stay**

In some cases, innovative migration management can assist States in negotiating some of the trade-offs discussed above. One case discussed to this effect during the seminar is that of the Mauritius, where the slump in worldwide sugar prices has led the State to support economic restructuring and diversification. To alleviate transitional unemployment and to tap upon the skills that can be acquired by their residents abroad in support of this transition, authorities are negotiating access to temporary or circular labour migration opportunities in countries such as Canada for their redundant sugar industry employees.

In addition, the seminar discussed bilateral or regional cooperation in migration management in the context of natural disasters. According to one participant, in the wake of the devastating 1960s' earthquakes in Turkey, Turkish citizens were encouraged to migrate as guest workers to Germany in order to alleviate the humanitarian burden faced by Turkish authorities and organizations. Both governments facilitated work visas. Although the program ran into challenges in ensuring return migration, migrants were seen to have contributed to reconstruction in Turkey through remittances.

## **Facilitating Internal Migration and Population Resettlements**

States have also moved to facilitate internal migration or population resettlements away from areas deemed at high risk of severe environmental degradation and/or natural disaster. During the seminar, the Chinese government was mentioned as having instituted a variety of programs to support organized migration from provinces severely affected by dust storms to less affected provinces. According to one participant, the authorities in receiving provinces are to guarantee integration grants, housing and other services, while the resettled/internal migrant workers are requested to follow local regulations. The national government is said to encourage provincial authorities in receiving areas to strengthen labour protections in order to protect resettled/internal migrant workers. The Beijing government, according to this participant, subsequently issued a regulation to this effect in 2004.

Inner Mongolia similarly supports population movements away from environmentally degraded areas and resettlement in sparsely populated areas. Provincial policies differ, and some work better than do others. In Western Inner Mongolia, one participant explained that households are afforded a 10-year window within which they may move to designated resettlement areas and receive a house, irrigated land, cash, and seeds. This program has proven relatively effective because migrants have had adequate time to establish themselves. Other programs involving a two-year subsidy guarantee have turned out to be less effective according to this participant. Migrants may run out of seed before recovering the costs of moving or financial support may prove insufficient to cover irrigation costs. In such cases, some migrants have been found to return to their places of origin, illustrating the importance of long-term planning.

Not only do unsustainable resettlement schemes run the risk of incurring return migration, but they also have the potential to adversely affect the environment in the area of resettlement.

## **Managing Urbanization**

Seminar participants also underscored the need for more environmentally sustainable urban planning that accounts for rural-to-urban and cross-border migration.

## **Strengthening Disaster Prevention and Mitigation**

Participants also exchanged views on a range of measures being used to improve disaster prevention and mitigation. The importance of preparedness was emphasized repeatedly. Some explained ongoing efforts to map areas at risk of natural disaster. Others described infrastructure that is being developed to more effectively protect coastal communities from storm surges. Still others highlighted the potential of improved spatial planning to prevent and mitigate natural disasters and their likelihood to result in human displacement.

Participants also concurred on the need to strengthen public awareness of the risks of natural disaster, the measures that can be taken to protect oneself and the evacuation and assistance policies in place. The institution of more dependable early warning systems, such as that deployed after the 2004 Tsunami, was also discussed. Here, participants underscored the importance of long-term planning, pointing to the need to continuously replace the buoys deployed in the Indian Ocean to sense impending tsunamis.

While acknowledging the importance of ensuring an effective humanitarian response followed by appropriate support for return, reintegration and reconstruction, seminar participants did not devote additional time to these issues as they are being extensively covered in other forums. Nonetheless, there was a general consensus on the need for such strategies to be more environmentally sustainable.

Towards this end, participants called for greater use of basic environmental guidelines for post-emergency response at local,



national and regional levels. Such guidelines complement international efforts, particularly within the framework of the humanitarian reform process, to mainstream environmental considerations into the planning and implementation of international aid. The UN Inter-Agency Standing Committee (IASC), for instance, is increasingly considering environmental issues in the context of its work on the cluster approach as it entails camp coordination and camp management as well as early recovery assistance, among other clusters.

### **Attending to Migrant Health**

The seminar also took note of the need to better address the health challenges that can be associated with environmental change and migration. In cases of natural or industrial disasters, the public health needs can be overwhelming, requiring that health issues be adequately included in all initiatives to prevent, mitigate and otherwise respond to disasters.

Issues of public health can also arise in relation to migration from areas experiencing a more gradual deterioration in environmental conditions. The shift in malaria zones associated with climate change effects is but one example. Meanwhile, in parts of the Amazon, where one participant noted that well contamination, deforestation and mining have led to the contamination of fish eaten by the local population, efforts to improve public awareness campaigns and medical treatment could assist in protecting the health of migrants from this area as well as their communities of origin and destination. Addressing the poor sanitation conditions in which many rural-to-urban migrants find themselves can also help to avert public health crises and mitigate pollution.



## **CONCLUSION: SUMMARY OF CHALLENGES AND LESSONS LEARNED**

As illustrated throughout this report, the proceedings of the seminar demonstrated a number of challenges and lessons learned with respect to improving our understanding of the associations between migration and the environment, as well as security. Seminar discussions similarly exposed, and discussed responses to, a variety of obstacles that policymakers and practitioners might encounter in seeking to more effectively manage these phenomena. Below is a summary of some of the main points raised.

### **Engaging all Stakeholders**

Perhaps first and foremost, participants concurred on the imperative of strengthening the interdisciplinary approach to managing environmentally induced migration and its implications for human security. In the first instance, improved cooperation is required at local and national levels among the migration, environmental, development, humanitarian aid, foreign and security policy communities, among others. States need to be at the centre of this effort, whether they be countries of origin or destination for environmental migrants. Cooperation at the bilateral, regional and global levels will also require strengthening over the years to come. Here, inter- and non-governmental organizations can facilitate coherence and capacity-building. The private sector, too, has much to offer, as companies and investors aim for higher standards of environmental, social and governance performance.

Given the importance of multi-stakeholder cooperation, participants welcomed the attention devoted to the notion of collective responsibility in the recent discourse on man-made climate change and strategies of adaptation and mitigation. However, they acknowledged that migration and its management will need to figure more prominently in this discourse if developments in adaptation are to be successful.

## **Identifying the Need**

When it comes to the challenge of identifying environmental migration and its causes and consequences, participants agreed that much work remains ahead. In particular, differentiating the environmental factor from several other potential drivers of migration calls for re-assessing the methodology of many of the assessments on migration propensity that have been conducted to date.

The concept of vulnerability mapping, briefly touched upon in this report, can help to more accurately locate those areas experiencing, or likely to experience, an outward flow of environmentally induced migration. Such research can also help us to understand which individuals and households within these areas are most likely to employ migration as a primary coping strategy.

Similar improvements are needed in our capacity to understand the net impact of migration on the environment in areas of origin and destination. The same goes for assessing the interaction of environmental change, migration and conflict, particularly in drylands experiencing relative poverty and weak governance.

## **Tailoring and Funding the Response**

With improved information at their disposal, all stakeholders will be better placed to identify the most humane and cost-effective policy and programmatic options to manage the phenomenon of environmental migration.

Where possible, interventions to stabilize communities of origin can make “fight or flight” more of a choice for local inhabitants. However, where community stabilization proves financially or technically infeasible, or where households demonstrate an interest in pursuing migration or resettlement as a temporary or permanent adaptation strategy, improvements in migration management are necessary.

In most cases, the most effective approach entails a combination of policies, including but not limited to those touched upon in this seminar. Ideally, these policies should address needs identified in the short-, medium-, and longer term. This in turn requires sustained budgetary support and political will at the national level, as well as sustained assistance from the international community.

Much hinges on enhancing the design and implementation of these policies and programs. In particular, greater care is required so that efforts to address environmental migration do not inadvertently heighten the risk for environmental degradation, natural and industrial disasters, or conflict in the areas of destination, whether they be cities and towns, rural areas of resettlement or regions hosting displaced persons, but to name a few. Similar caution is needed lest post-emergency migrant return initiatives unintentionally contribute to environmental degradation in areas of return. The design and implementation of these initiatives can also benefit from greater sensitivity to questions of poverty, population growth, gender, age, social networks and vulnerability, all issues that impact considerably upon environmental change, associated migration patterns and the needs of migrants.

## **Monitoring and Evaluation**

For States and other stakeholders to continuously improve upon their interventions in the evolving field of environmental migration management, there is an important need for capacity-building in monitoring and evaluation. Based on the advances being made in interdisciplinary research on the process and effects of environmental migration, participants agreed on the need to develop, improve and integrate objectively verifiable indicators and means of verification into policymaking and project development, monitoring and evaluation.

## **The Way Forward**

Through facilitating dialogue on the above issues and challenges among specialists from diverse backgrounds, the IOM/UNFPA seminar contributed to a more comprehensive understanding of select causes and consequences of environmental migration. It also afforded participants with an opportunity to exchange experiences in research, policy and programming and to delineate existing challenges and lessons learned.

Not to be discounted, this forum additionally served to forge or deepen multi-stakeholder partnerships that will be crucial to applying these lessons learned in practice. As this and other seminars continue to move the debate forward, environmental migration stands to be better managed to the benefit of migrants and their communities of origin and destination.

**PART II:  
SEMINAR AGENDA**







IOM International Organization for Migration



## INTERNATIONAL DIALOGUE ON MIGRATION 2007

### EXPERT SEMINAR MIGRATION AND THE ENVIRONMENT

22-23 February 2007  
Bangkok, Thailand

#### AGENDA

#### THURSDAY, 22 FEBRUARY

8:00-9:00 REGISTRATION OF PARTICIPANTS

9:00-10:00 OPENING SESSION

##### Opening Remarks:

- **Mr. Chartree Chueyprasit**, Deputy Permanent Secretary, Ministry of Natural Resources and Environment, Thailand
- **Dr. Garimella Giridhar**, Representative for UNFPA Country Office in Thailand and Director for UNFPA Country Technical Services Team for the East and Southeast Asia
- **Ms. Irena Vojackova-Sollorano**, Chief of Mission and Regional Representative for IOM Regional Office for Southeast Asia

##### Setting the Scene by IOM:

- **Ms. Michele Klein-Solomon**, Director, Migration Policy, Research and Communications, IOM Headquarters

10:00-10:30 COFFEE BREAK

10:30-13:00 SESSION I  
**IMPACT OF GRADUAL ENVIRONMENTAL CHANGE  
ON MIGRATION: A GLOBAL PERSPECTIVE**

**Keynote presentation by: Dr. Janos J. Bogardi**, Director, Environment and Human Security Unit, United Nations University, Germany

##### Discussions:

- What are the gradual environmental changes that could produce/increase migratory flows?

- What types of migratory patterns linked to gradual environmental changes can be expected? What is the respective significance of and what are the links between internal and international migration in this context?
- What policies and programmes can the international community put into place to plan for and respond to these types of migratory patterns?
- How to achieve policy coherence on issues related to environmentally induced migration at the national, regional and inter-regional levels? For example, coherence between migration and environment policies, and among different levels of government, civil society and the private sector. What are the existing mechanisms; what adjustments to these mechanisms need to be made or what new mechanisms are needed, if any?

13:00-14:30

**LUNCH BREAK**

14:30-16:00

**SESSION II**  
**IMPACT OF GRADUAL ENVIRONMENTAL CHANGE ON MIGRATION: REGIONAL AND NATIONAL PERSPECTIVES**

**Keynote presentation by: Dr. Cesar Morales**, United Nations Consultant and Project Manager, PROCASUR, Chile

**Discussions:**

- What types of migratory patterns related to gradual environmental changes (including internal and international migration) are relevant at the national and regional levels?
- What policies and programmes can governments put into place to respond to these types of migratory trends? Do gradual environmental changes imply gradual policy responses?
- Should these policies depend on the scale of migratory flows and characteristics of the affected populations?
- What policy responses can be undertaken to stabilize livelihoods and populations threatened by environmental changes?
- What policy options are there to provide alternatives to migration?

16:00-16:30

**COFFEE BREAK**

16:30-18:00

**CONTINUATION OF SESSION II**

19:00-21:00

**WELCOME RECEPTION**

**FRIDAY, 23 FEBRUARY**

9:30-11:00

**SESSION III**  
**THE EFFECT OF EXTREME ENVIRONMENTAL EVENTS ON MIGRATION**

**Keynote presentation by: Dr. K. Maudood Elahi**, Professor and Chairman, Department of Environmental Science, Stamford University, Bangladesh

**Discussions:**

- How can we move from emergency response to preparedness with respect to migration related to extreme environmental events?
- How would such planning fit into a broader strategic approach to migration and the environment?
- What are the respective roles of various stakeholders (different levels of government, civil society and the private sector) in managing the response to migration related to extreme environmental events?
- What assistance can be provided to populations vulnerable to extreme environmental events in the short, medium and long term? What preventive measures could be included to achieve a comprehensive strategy to reduce vulnerability to displacement related to extreme environmental events?

11:00-11:30

COFFEE BREAK

11:30-13:00

CONTINUATION OF SESSION III

13:00-14:30

LUNCH BREAK

14:30-16:30

**SESSION IV**  
**THE IMPACT OF MIGRATION ON THE ENVIRONMENT**

**Keynote presentation by: Dr. Laurent Lepage**, Professor, Institute of Environmental Sciences, Université du Québec à Montréal, Canada

**Discussions:**

- What are the existing and potential environmental consequences of population movements?
- Is there a distinction between the environmental impacts of shock-driven migration versus other types of migratory patterns?
- What policies and programmes can be put into place at different levels (local, national, regional and international) to mitigate environmental effects of population movements?
- Recognizing that environmental factors can be both a cause and consequence of migration, how do these policies relate to the policy responses for addressing environment-related migration discussed in earlier sessions? How can coherence be achieved among all of these policy responses?

16:30-17:00

COFFEE BREAK

17:00-18:00

WRAP-UP and CONCLUDING REMARKS



# **PART III: ABSTRACTS OF THE SPEAKERS' PRESENTATIONS<sup>4</sup>**

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<sup>4</sup> The following abstracts have been provided by the speakers. IOM and the UNFPA are not responsible for the views expressed in the abstracts.



## OPENING REMARKS

**Mr. Chartree Chueyprasit**, Deputy Permanent Secretary  
Ministry of Natural Resources and Environment, Thailand

International migration has been widely observed to be an increasing global trend. Reasons for migration include economic, political, and environmental factors; while most economic migration is seen as voluntary, political and environmental migration is more often seen as forced. At the same time, it is widely accepted that rapid industrial development over the past century has caused environmental degradation and contributed to global climate change. This seminar will focus on the effect of environmental degradation on migration, the effect of sudden natural disasters on forced migration, as well as the effect of migration on the environment.

There are numerous examples of gradual environmental change causing or potentially causing migration. Rising sea levels would inundate parts of Bangkok. An increasing variability in weather patterns has caused more frequent and severe storms (hurricanes and typhoons, for example), less predictable rainfall, flooding, drought, and desertification, all of which affects food production. Entire communities can be disrupted by such changes. Farmers, especially those eking out a marginal livelihood, are most affected. These meteorological changes can be long-lasting and lead to forced migration.

Migration, in turn, can lead to conflicts over scarce resources, such as water, farmland, and timber, which in turn can lead to even further migration. Such problems are found not only in Thailand but in Africa, the Caribbean, Bangladesh, and elsewhere and are expected to intensify in the future.

Extreme environmental change can lead to sudden forced migration of people in the affected area. Two very dramatic examples of this are the Southeast Asian tsunami of 2004, which claimed more than 160,000 lives, and the 1999 earthquake in Turkey, which claimed 17,000 lives and made hundreds of thousands of people homeless. Such extreme changes result in mass movements carried out over a short period of time, thus presenting management challenges not present in gradual migration movements. If such large scale movements of people are not properly managed, they can lead to further environmental degradation, social problems, and resource scarcity.

There is a strong connection between environmental degradation and migration. This experts' seminar aims to share participants' knowledge and experience and to promote discussion on these issues. It aims to identify means to ensure proper coherence and planning in dealing with them, both at the planning and operational levels. The seminar will try to arrive at a useful set of practical recommendations for our future work on the issue of migration and the environment, which is so pertinent to millions of people around the world.



**Dr. Garimella Giridhar**, Representative, UNFPA Thailand  
Director for UNFPA Country Technical Services Team for East  
and Southeast Asia

The UNFPA looks forward to collaborating with IOM to explore the intersection between migration and the environment, an area that has been neglected but is increasingly important.

Although UNFPA, in partnership with other organizations, has addressed questions relating to both migration and environment, it has not yet comprehensively connected and addressed the two together. The 1992 United Nations International Conference on Environment laid the groundwork for international cooperation in environmental management. The principles developed during the conference recognized links between environmental management, conflict, and sustainable development.

The 1994 International Conference on Population and Development (ICPD) dealt more specifically with both migration and the environment, but in a slightly different way. At the ICPD, 179 governments adopted a forward-looking, 20-year Programme of Action (PoA) that built on the success of the population, maternal health and family planning programs of the previous decades while addressing, with a new perspective, the needs of the early years of the twenty-first century.

The ICPD Programme of Action, sometimes referred to as the Cairo Consensus, addresses, inter alia, the environment and consumption patterns and internal and international migration. It was recognized that in developing nations, there is a problem of access to resources, while in developed nations, there is excessive consumption and possibly wasteful production practices. This disparity in access to resources is one of the driving forces behind migration, and this is exactly where the issue of environmental degradation is raised. We must determine how migration affects the environment of both the places people are migrating to and the places they migrate from.

In the twelve years since the ICPD, the international community has begun to realize the significance of the relationship between international migration and the environment. We look forward to exploring this relationship further in cooperation with IOM.

**Ms. Irena Vojackova-Sollarano**

Chief of Mission and Regional Representative

IOM Regional Office for Southeast Asia

IOM is a practical organization that is mostly concerned with the movement of migrants from one place to another. But the world is changing. It is not enough anymore merely to facilitate the movement of people; we need to determine why they move. Over the last decade, the causes for population movement have become more complex. In addition, migration and the environment is a topic that has increasingly caught our attention and has been added to our agenda.

Our member states are exploring how to control and manage migration as a means of preserving national sovereignty. But migrants often have a different agenda, as they seek to move in search of new opportunities. Environmental change increasingly results in migration, not only in the case of disasters, where people have to move suddenly, but also in the case of gradual environmental change. For example, some farmers can no longer farm because there is no water for crops and livestock. Some fishermen can no longer fish because their fishing grounds have been depleted. In Thailand, shrimp farmers have lost their livelihoods as a result of the tsunami; they lack the means to buy new equipment and start anew, so they must find other ways to make a living. Increasingly, people are forced to migrate from their places of origin to pursue new livelihoods.

Such environmental change is not something that can be limited to one country, so countries must communicate with each other on this issue. Migrants are moving not only within countries but also internationally. In Thailand, a rise in sea level would flood a significant area of Bangkok. In Bangladesh, a rise in sea level of only 10 centimetres would result in most of the country being flooded . . . forever. Small islands and island states in Asia and the Asia Pacific would disappear. Some island states have taken proactive approaches, realizing that their people will have to look for a new home if seas rise, and have contacted New Zealand and Australia to determine if their people would be welcome should their islands disappear. Small countries, which see the coming changes as imminent, are proactive. In bigger countries, with

more land and more resources, people moving from one place to another does not have as acute of an impact, and such countries therefore do not seem to be as alert to the immediate danger that such “gradual” changes can produce.

In terms of migration, the problem is not just where displaced people will go, but the fact that migrants will also affect the environment of their destinations. With mass migration comes crowding and problems of integration of newcomers, which will require international cooperation. Our goal here is not to talk about how to stop or slow environmental change; these issues are being discussed in other areas and the details are outside our area of expertise. Rather, our aim is to gain an understanding of how to deal with the effects of environmental change, specifically migration, and to try to work towards recommendations for countries on how to deal with this complex issue.



## SETTING THE SCENE

### **Ms. Michele Klein-Solomon**

Director, Migration Policy, Research, and Communications  
International Organization for Migration Headquarters

This seminar is extremely timely, as it is clear that environmental and migration issues have risen to the top of many governments' agendas. The growing interest in migration issues, for example, is demonstrated in the exponential growth of IOM over the last decade. We now have 120 member states, up from 67 in 1998, and 19 observer states. There are also 70 regional and global inter-governmental and non-governmental organizations with observer status, as well as a sharp increase in staff, active projects, and field office locations. IOM, upon request from governments, provides technical assistance and capacity building on a range of migration issues. Pursuant to our constitution, IOM also provides a forum for states and other stakeholders for the exchange of views and experiences and the promotion of cooperation and coordination on international migration issues.

Migration is a complex and cross-cutting issue. Different policy areas affect and are affected by migration, which can be permanent, temporary, or circular. Migration management requires cooperation between governments and other relevant stakeholders. The International Dialogue on Migration (IDM) is a series of workshops convened with the support of donor governments, often in partnership with relevant organizations and institutions (in this case, the UNFPA). The goal of the IDM is to build bridges between migration and other policy domains. In the past, we have explored the interplay between migration and trade, health, and development. Up until now, there has been no systematic treatment of the relationship between migration and the environment, although both issues have been explored at length in isolation of each other. Through this workshop we aim to remedy

this gap, recognizing that there is a two-way relationship between migration and the environment, each influencing the other.

Currently, the global media and policy focus is on massive population displacement caused by large-scale extreme environmental events. Slower displacement caused by gradual environmental change is less likely to be integrated into policymaking or garner much public attention. We aim to make a systematic effort to link migration and the environment and to move beyond the current limited focus on extreme environmental change. However, there are tensions between short-term and long-term plans, in both policy and politics. While it is easier to mobilize support for immediate, large-scale disaster relief, dealing with long-term, gradual climate change and the resulting population movement is much more difficult. There is a hesitation on the part of policymakers to take action on gradual and sometimes “invisible” environmental changes, especially when such action involves long-term budgetary commitments.

Over the past twenty years, environmental considerations have been factored into other policymaking domains, especially that of development. We believe that greater integration of migration policy questions is the next horizon. Our challenge, in response to governments’ requests to IOM for assistance, is to devise a more coherent migration policy approach with regard to environmental phenomena. Policy coherence is particularly relevant due to the complex, transnational, and multifaceted nature of both migration and the environment, with both possessing ties with many different policy fields.

As an initial step, we need to develop migration impact assessments, just as there are nowadays environmental impact and policy studies. We need to take care to ensure policy coherence between migration and environmental policies, as well as with development planning in general. The complex, variegated linkage between migration and the environment makes predicting effects difficult.

Two key questions we pose are:

- How can we create better *awareness* between migration and environmental policy fields?
- How can we create better *coherence* in policy and practice?

# **SESSION I: IMPACT OF GRADUAL ENVIRONMENTAL CHANGE ON MIGRATION: A GLOBAL PERSPECTIVE**

## **Keynote Address**

**Prof. Dr. Ing. Janos J. Bogardi**

Director, Environment and Human Security Unit  
United Nations University, Bonn, Germany

## **Introduction**

As a faculty member at the United Nations University, I am very happy to see this partnership between IOM and UNFPA to explore the connections between environmental and migratory issues. The primary purpose of the UN University is to use an interdisciplinary approach to create knowledge relevant to policymakers at many levels. When I first started to promote an Environment and Human Security department in 2003, it took some effort to explain to the academic community why these two things belong together. Now, after the world has witnessed the profound human impact of large-scale environmental catastrophes like the South Asian tsunami, I no longer need to provide an explanation.

## **Environmental Change and Human Development**

It is indisputable that many of the environmental issues that worry us today have been occurring for years. Climate has never been stable, but we did not really notice. Land degradation started several thousand years ago with agriculture and irrigation. Urbanization has historically been seen as a sign of development, and migration is a steady component of human history. However, the increased rate of change and unpredictability of these events in recent years suggest that these processes are spiraling out of control.

Standard recording of meteorological observations started about 150 years ago. For the first 100 years, changes in global climate were more or less obvious – people could predict how the climate was going to change and to what degree. In the last 50 years, however, change has accelerated and become unstable. This volatile change has manifested itself in diminishing snow cover and rises in sea level. Although many scientists have created data reflecting how they believe climate will change over the next 100 years, it is difficult, if not impossible, to predict what will happen. The predictions could be right, or climate change could be even worse.

The Millennium Ecosystem Assessment (MA), initiated by UN Secretary General Annan in 2000 and completed in 2005, determined that 15 of 24 ecosystem services are degraded due to overdevelopment and unsustainable use. There are large populations in fragile ecosystems, which could accelerate their degradation, but more scientific evidence is still required on this point. The poor, especially the rural poor, are suffering most by the decline in ecosystem services, and two billion people living in dry regions are extremely vulnerable to potential desertification in formerly fertile regions. Even the western United States and Australia are heavily vulnerable, but not as vulnerable as Central Asia, Southern Europe, and the Sahara zone in Africa, the latter of which is major source of migration due to environmental reasons.



Urbanization was once seen as an exclusively positive sign of development. But now, the average size of world's largest cities is growing exponentially. Sometime this year, the world's urban populations will outnumber those in rural areas. Some estimates state that the global population will need the same number of people in urban areas as in rural to maintain sufficient food production, but if you look at two biggest food surplus producers in the world (Netherlands and the United States), they only have about five per cent of the population in rural areas. Again, because projections are unreliable and often don't take scientific innovation into account, the global population may be able to sustain sufficient food production with a largely urban population. More troubling, however, is the environmental stress produced by high population density in fragile ecosystems and the effect of environmental degradation on previously fertile agricultural areas, especially those in dry or coastal areas.

Because of environmental degradation, human security, defined as freedom from want and fear, is at stake. The United Nations has identified seven measures or societal activities that are indicators for sustainable human development: productive economic activity, access to food, overall health, community ties, political stability, personal well-being, and the ability to live in a clean environment. Swift natural hazard events and climate variability and change have affected and been affected by these indicators, thus leading to privation and conflict. Although the United Nations has not included freedom from hazard impacts as part of the traditional definition of human security, perhaps it should, as recent events demonstrate the catastrophic effect natural and man-made disasters have on individual lives. In the fight toward greater global equality and human dignity, security issues cannot be separated from human development.

In spite of an increased dialogue on sustainable development and equality, the world is not moving toward solidarity. Indicators clearly show that in the last 40 years, the disparity between rich and poor countries increased tremendously. In 1960, the gap in per capita income was 30:1. Now, the ratio is 80:1. Similarly, the life expectancy differential between the richest countries and the poorest countries has increased; for example, the life expectancy in Malawi is only 40 years, while that of Japan is 81.

## **Migration and the Environment**

Obviously, migration is a coping mechanism for global inequality. The real question is whether migration is ever voluntary, regardless of whether the migrants are moving based on economic, environmental, or political reasons. I would disagree that economic migration is voluntary – if you are poor and cannot eat, you have to move, and it is a mode of forced migration. In order to determine how much of this movement is environmentally driven, we must determine where the migrants are coming from, delineate where they might be coming from in the future based on climate change projections, and look into the future to prepare both countries of origin and destination for large-scale movement.

Migration is due to a mixture of “push” and “pull” factors. Some root causes include: economic factors, such as poverty, unemployment, and wage disparities, social factors, such as poor welfare or lack of educational opportunity, degraded security conditions, and, of course, environmental factors, such as degradation of ecosystems. Existing migrant networks can also facilitate migration, but can give it a negative spin because people move through illegal networks. In this sense, migration is interwoven with the illegal activities of trafficking, which needs to be addressed.

Because most migration data does not include the reasons why people decide to leave their countries of origin, it is often difficult to determine how much migration is directly connected to environmental degradation. Countries’ net immigration and emigration numbers are not disaggregated to show individual reasons for migration, and it is clear that many of the push and pull factors have to do with unequal distribution of wealth and disparate employment opportunities. Disparity of wealth within a country can also be a factor influencing migration; if wealth distribution is extremely disparate, the country will most likely be a country of origin rather than destination.

I have already cited the inherent difficulty in making accurate predictions of future migrations; however, scientific modeling

can show us what areas will become uninhabitable should the sea level rise up to one metre. Some of these areas are not densely populated, but some are; this means millions of people could potentially be on the move. Due to the coastal locations of many northern urban centres, a metre rise in sea level would result not only in south-north, but also in north-north migration. Another potential source of massive migration would be the accelerated loss of land productivity due to droughts, especially once coping mechanisms and adaptation strategies are impaired by the loss of ecosystem service. Disasters of “natural” origin may also prompt people to leave.

### **Debate over the Concept of Environmental Migrants/ Refugees**

There are many critics of the concept of environmental migrants/refugees. Many rightly point out that there are multiple push and pull factors for migration, and question the wisdom of singling out the environmental component. Others cite the poor definition of what an environmental migrant/refugee is. Some fear that by using the term environmental refugee, we risk watering down the 1951 Geneva Convention related to the status of refugees, largely accepted as a cherished achievement of humanity. While we certainly should not misuse the definition of ‘refugee’ to unnecessarily broaden it, more people are on the move for environmental rather than political reasons, so we need some definition to describe these population movements.

Because accurately defining the phenomenon of environmental migrants is so crucial, I propose three categories of environmental migrants. The first are *environmentally motivated migrants*, who “pre-empt” the worst by leaving before environmental degradation results in a complete devastation of their livelihoods and communities. These individuals may leave a deteriorating environment that could be rehabilitated with proper policy and effort. These migrants are often seen as economic migrants, and their movement results in both temporary and permanent displacement. Some examples of this include depopulation of old industrial and mining areas, or rural exoduses. A specific case

would be the rural exodus from Northeast Brazil to Sao Paolo due to long dry spells.

The second category are *environmentally forced migrants*, those who are “avoiding” the worst. These individuals have to leave due to a loss of livelihood, and their displacement is mainly permanent. Examples include displacement or migration due to sea level rise or loss of topsoil. A specific case would be the out migration from the Sahel zone of Africa due to desertification.

Finally, the third category are *environmental refugees*, or disaster refugees, those who are “fleeing the worst.” These individuals literally have to run for their lives, and their displacement can be temporary or permanent. When there is displacement due to floods or extensive drought, the migrants’ traditional resource base (ecosystem) may be severely affected. One such case was the exodus from New Orleans and the rest of the Gulf Coast due to Hurricane Katrina in 2005.

### **Moving Toward Comprehensive Global Management of Environmental Migrants: Adopting a Precautionary Principle**

Despite the inherent uncertainty in predicting exactly how and to what extent the global climate will change, it is “important not to trivialize the role environmental change and resource depletion may play in population movement.” (Loneragan and Swain 1999:2) Governments and other relevant stakeholders must take action to tackle this issue. Governments could promote action related to the reduction of desertification rates and climate change and, when possible, implement restoration and adaptation strategies. States must also formulate policies to deal with the immediate and/or forthcoming issue of environmental migrants/refugees. Governments need to put a framework in place to assist those who are moving toward destination countries. There should be a parallel between these policies and policies aimed at reducing the causes of environmental degradation.

As a start, an Intergovernmental Panel on Land Degradation could be established to assess scientific, technical, and socioeconomic information to understand the risks linked to human-induced land degradation, its potential impacts, and options for adaptation and mitigation. Using the Intergovernmental Panel on Climate Change (IPCC) as a model could be a good starting point. The Panel would use a scientific approach to make regular assessments of the state of our knowledge of land and soil, including the social implications of degradation of once fertile ecosystems.

Although there are some who believe that climate change is not taken seriously enough, I would be one optimist who says that it is very much in the mind of the people and on the political agenda. Whether we do something is a different story. It usually takes a few decades for this to translate into policy. However, land degradation is not at all in the minds of the people. This is demonstrated by the fact that we treat environmental refugees arriving in Europe as unwanted migrants. Fortunately, most are able to find jobs, but land degradation is not treated politically or scientifically. What is needed is a lot of scientific evidence and a universal awareness that people are forced to migrate because of environmental deterioration. An Intergovernmental Panel should work to raise public and political awareness, especially in the target countries.

The international community should adopt a five-pronged approach to deal with the issue of environmental migration. The approach would include the following:

- **Science:** The global community should establish and implement programs to develop a better understanding of the cause and effect mechanisms between degradation of ecosystems and social systems. We should work to develop proper definitions of environmental migrants/refugees, and provide long-term, sustained funding for research.
- **Awareness:** It is crucial to promote public and political awareness of the social, economic, and environmental dimensions that inform the phenomena of migration due to climate change.

- **Legislation:** Governments should establish and implement a framework of recognition of environmental migrants, either in a specific convention or in parts of intergovernmental environmental treaties.
- **Humanitarian Aid:** International organizations can help people on the ground, but they are not given means and mandate to deal with environmental migrants. Humanitarian action is draining organizations' resources unnecessarily, so legislation should be the first step. However, the United Nations and other major assistance organizations should be empowered to provide aid to environmental migrants/refugees.
- **Institutional:** Governments should establish institutions to assist the flux of environmental migrants. Instead of spending the majority of their resources on border enforcement mechanisms, governments should take action to prevent catastrophic climate change and assist those fleeing such disasters in a humanitarian manner.

## **Moving Forward**

Over the past fifteen years, the United Nations have begun to look at migration in a different way. The international community is slowly beginning to explore the nexus between migration and development, and recently has begun to bring the environmental question to bear on the subject of migration. We should endeavor to enhance the ongoing international debate on migration with a strong environmental component.

# **SESSION II: IMPACT OF GRADUAL ENVIRONMENTAL CHANGE ON MIGRATION: REGIONAL AND NATIONAL PERSPECTIVES**

## **Keynote Address**

**Dr. Cesar Morales**

United Nations Consultant and Project Manager  
PROCASUR, Chile

## **Introduction**

Before we can determine what types of migratory patterns related to gradual environmental changes are relevant at the national and regional levels, we must first define the main concepts. Gradual environmental changes are those that occur over a long period of time and manifest themselves in small increments. These changes normally have a breaking point, or a threshold after which they are irreversible. Some examples of gradual environmental change are desertification, land degradation, deforestation, and a loss of biodiversity. These phenomena can lead to land erosion caused by wind or water, deterioration of the physical, chemical, biological, and economic quality of the land, and a permanent loss of natural vegetation.

The effects of gradual environmental change are significant. Desertification has damaged almost 30 per cent of the world's land.

The desertification crisis is especially acute in drylands covering more than a third of the earth's surface, where soil, vegetation, and fauna are especially fragile. Seventy per cent of the 5.2 billion hectares of dryland used for agriculture around the world is degraded. Each year, all continents lose 24 billion tons of topsoil. Over the last two decades, the loss has been as large as the entire cropland of the United States.

### **Human Activities and their Impacts on Gradual Environmental Change**

A variety of human activities contribute to gradual environmental change. Agricultural activities cause land and soil degradation on every continent. Deforestation and overexploitation of vegetation for domestic use causes degradation in conjunction with agriculture, resulting in wind and water erosion in many countries, including island states of the Caribbean, Costa Rica, Honduras, Malaysia, and Togo. Overgrazing is a dominant cause of land and soil degradation in most developing countries, especially in the Sahel belt of Africa, as well as in many developed countries, including Australia and the western United States. Biological degradation caused by industrial pollution (e.g. toxic waste, acid rainfall) is a major cause of degradation in some European countries.

### **The Situation in the Latin American and Caribbean Territory (LAC): Environmental Degradation and Migratory Flows**

Although well known for its rainforests, over one fourth of the Latin American and Caribbean territory is dry land, 70 per cent of which is vulnerable to an advanced degree of desertification. Soil erosion is the main cause of desertification, followed by deforestation and overgrazing. Large parts of Colombia and Venezuela are highly degraded. Erosion and water shortages are noticeably intensifying in the Eastern Caribbean. Land



degradation and severe droughts have made the Central American countries vulnerable to extreme weather. The total losses due to desertification might reach US \$975 million per year. According to the United Nations Environment Programme (UNEP), it would be necessary to invest up to US \$13 billion to restore the degraded land of the region.

In addition to the various environmental “push” factors, there are three main types of factors driving the choice to migrate: economic, social, and cultural factors. Economic factors include the geographic differentiation of income and employment opportunities in the places of origin and destination, as well as the monetary and opportunity costs of transport and relocation. Social factors can include geographic differentiation in quality of life and the social costs of moving. Cultural factors leading to migration include the migrants’ degree of cultural integration in the place of origin, the existence of migrant networks, and the degree of cultural differentiation between the places of origin and destination. While most migration is internal, some combination of the above factors, such as a large income differentiation and the existence of migrant networks, can lead to international migration.

Gradual environmental change will usually, at least initially, result in mainly internal migratory flows. Some examples include the flow of migrants pushed by drought and resulting desertification from Brazil and Argentina’s northeast regions to the state capitals and the south-central regions of each respective country. In Chile, Mexico, Ecuador, Bolivia, Peru, the Dominican Republic, and Haiti, most migrants move from degraded areas to main cities, provincial or state capitals, and national capitals. In Bolivia, rural-urban migrants driven by desertification have moved in sufficiently large numbers to compose almost the entire population of the city of El Alto, largely created by the influx of about 1.5 million migrants in the last 30 years. Lima, Peru has also grown exponentially because of the flow of environmental migrants and is joining the ranks of the world’s megacities.<sup>5</sup> Other countries, such as El Salvador, see a larger proportion of migratory flows to neighboring countries and the United States.

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<sup>5</sup> Megacities are metropolitan areas with more than ten million inhabitants.

There is a two-way relationship between the socioeconomic and environmental factors that drive migration. For example, while poverty can result from a loss of land productivity, it can also be a cause of desertification and land degradation; in LAC, this relationship is very important. Poor people who are small producers live in degraded areas. Normally, these poor families will have small area of poor-quality land and face a scarcity of water. The only way to survive is to overexploit the land. That leads to vicious circle that ends in more degradation. Some family members must migrate to more developed areas and send remittances back to their families in rural areas because it becomes impossible to sustain the entire family on increasingly degraded land.

Until the 1960s and 1970s, migration from rural to urban areas was a dominant trend. Around the 1980s, migratory flows changed dramatically, as migration between urban zones became more important while rural to urban flows diminished. However, migration from the rural to urban sector is still the main source of urban growth, and population density for both rural and urban areas continues to increase.

## **Policy Responses**

What policies and programs can governments implement to respond to these migratory trends? Do gradual environmental changes imply gradual policy responses?

Policies must take into consideration that desertification and degradation are processes that affect mainly the poorest rural populations. These processes have intergenerational impacts that affect the future of the country and the region. Policies must be formulated taking into account the characteristics of affected populations. For example, indigenous populations normally work through associative organizations. The old population in the rural sector needs special attention. In some countries, men migrate first, leaving women in charge of the productive unit. This means governments must ensure that women have access to whatever programs are implemented. Finally, states must take into

account the reality of family disintegration, which occurs when both parents migrate and children are left with grandparents or other relatives.

There are policy options to provide alternatives to migration. The state can act to address inequality of land distribution and a scarcity or absence of financial resources, which are two main causes for unsustainable agricultural practices and overexploitation of natural resources. Governments can give subsidies to ensure a minimal income and a quality of life that includes unemployment insurance, healthcare, electricity, and drinking water. Some governments have distributed subsidies in an effort to change animal husbandry practices and diminish overgrazing. El Salvador, in response to extreme deforestation caused by overexploitation of lumber for cooking purposes, has given subsidies for the construction of solar powered cooking devices.

Governments can also offer incentives to residents of affected areas to regenerate the forest and retain or regenerate soil cover. The state can finance tree plantations, exchange large amounts of low-quality livestock for lower numbers of more productive breeds, or promote the use of technology to take advantage of solar power. The Brazilian government has instituted a water harvesting and redistribution program in the Northeast of the country that has been effective.

Other policies have been implemented to slow the rate of land degradation and promote sustainable practices in vulnerable areas. A retirement program has been instituted in Northeast Brazil to discourage the elderly residents of vulnerable areas from engaging in unsustainable land use practices. Policies to facilitate the transfer of land to younger generations and microcredit programs can create incentives for young people to engage in eco-friendly use of their properties. Finally, it is essential that governments construct a system of social and economic indicators to monitor the efficacy of their programs and any further environmental changes.

Governments should not implement policies gradually, but should act aggressively to slow or reverse environmental degradation. Usually, gradual environmental change is irreversible

or almost irreversible. The costs involved in environmental rehabilitation and regeneration increase dramatically once the desertification and degradation processes reach certain levels. In other words, it is much cheaper for governments to act preemptively than to try and reverse environmental degradation.

# **SESSION III: THE EFFECT OF EXTREME ENVIRONMENTAL EVENTS ON MIGRATION**

## **Keynote Address**

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This presentation concentrates mainly on Extreme Environmental Events (EEE) and addresses how EEEs directly or indirectly affect human habitat and trigger population displacement and migration at local, regional and global levels. For the present discourse, the EEE is defined as any disaster that is likely to affect a large population and/or a wider region whose effects are experienced immediately by the community. EEE-induced migrants are displaced due to loss of their immediate environment for sustenance. This presentation offers a broader or macro-view of environmental events that cause greater movement of people, with reference to some of the disasters in known history.

It is important to understand how such events relate to population displacement and potential migrations so that we may be more prepared with emergency responses, fit disaster responses into a broader planning strategy, sensitize the various stakeholders in managing the responses, and make short, medium and long term provisions towards achieving a comprehensive strategy to reduce vulnerability of displaced and migrant populations.

## **The Nature of EEE and the Degree of Vulnerability: Some Examples**

Today's society has become more vulnerable than ever to EEE due both to a growing urban concentration of population in environmentally critical areas, and to a faster increase of population in less developed regions, which forces people to occupy marginal areas prone to various natural and man-made disasters. In both cases, people have caused irreversible degradation of his immediate environment. The EEE in many cases are caused, in part, by over-exploitation of natural resources. When overpopulation and development projects upset the fragile natural balance, floods, drought, or other traumatic EEE can occur.

The consequences of mega-hydrologic projects, river channel diversions and resultant siltation, expansion of agricultural and aquaculture practices in many marginal areas are the cases in point (Khan, 2005, Rahman and Hassan, 2006, and IUCN, 2006). Some of these large development projects are carried out in ecologically inappropriate areas, such as those prone to natural disasters like earthquakes, by governments without the means or political will to institute costly and long-term environmentally friendly safeguards. In some cases, even a slight interference with ecological-geological balance can initiate enormous environmental damage. Like most environmental events, the possible consequences of poorly planned development projects are not limited by political borders, and one nation's actions in creating and ecosystem imbalance can have disastrous implications for neighboring countries.

For example, a giant dam, expected to be one of the biggest in the world, is planned near the Namcha Barwa by the Chinese within a few years. It is expected that the dam would generate 40 million kilowatts of hydroelectricity (double the Three Gorges Dam over the Yangtze) once its 26 turbines begin operation. The electricity produced could be exported to the neighboring countries. The environmental and socioeconomic consequences of this dam and the diversion of water to northwestern China are expected to be multiple and far reaching not only for Tibet, which is directly downriver from the project, but also for India and

Bangladesh, into whose territories the soon to be diverted rivers flow. India and Bangladesh would be at the mercy of China for adequate release of water during the dry season and for protection from floods during the rainy season. The whole region could be starved of nutrient-rich sediments that enrich the soil because they would be held up in the reservoir instead of reaching the downstream active delta. Lastly, a serious environmental disaster could ensue, as this area is located in a highly active seismic zone. An earthquake causing a dam breach would lead to devastating flash floods in China, India, and Bangladesh. The whole situation indicates a potentially major economic catastrophe and population displacement over a large area in future.

On the other hand, a number of EEE are the results of metrological phenomena, such as, typhoons, hurricanes, coastal flooding and river-based flooding and bank erosion. In Bangladesh, there is an established causal link between poverty, local displacement of population (LDP) as well as temporary and permanent migration due to environmental degradation caused by river flooding. An estimated 1 million people are thus displaced annually – many of whom are forced to migrate to the urban centres (Elahi et. al. 1991). Together with such a demographic dislocation, the situation is worsened by the post-monsoon joblessness known as *Monga*<sup>6</sup> syndrome, which reduces purchasing power of essentials for survival for about two million people in Northwest Bangladesh and in erosion-prone areas (Elahi et. al. 1991; Rahman and Hassan, 2006).

Another potential metrological hazard is related to global warming and sea level rise – mostly in the tropics. Vulnerability to EEE has increased in many coastal areas as a result of the loss

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<sup>6</sup> *'Monga'* (meaning crisis) is the localized and temporary famine-like situation that prevail in the northwestern districts of Bangladesh almost every year during October to November roughly corresponding to the month of Kartik of the Bangla calendar. This coincides with the time when Aus paddy is exhausted and Aman paddy awaits to be harvested, and a severe joblessness breaks out for the poorer or agricultural class of people in the districts of northwestern Bangladesh. Therefore, it is widely known as the 'Kartiker Monga' in this region. This syndrome throws about 2 million people of mostly poor and landless classes into great misery of food shortage due to lack of work in-between the gap of two crops during October and December. Most of these people tend to migrate to urban centres. The main reason of this situation is related to higher rate of landless population and a marked gap between the rich and the poor in this part of Bangladesh.

of habitat, i.e. mangroves and coral reefs that formerly provided natural protection against coastal flooding, and also of the loss of natural flood or water-retention areas due to resource exploitation and unsustainable agricultural practices. Studies have suggested that global temperature rises of just 2 to 3°C will see lower crop yields in agriculturally rich regions of Africa, Western and South Asia by as much as 30 to 40 per cent (Beckett, 2007). These are also some of the highly populated areas of the world. Meanwhile, one billion people in South Asia are likely to struggle to get water for domestic and farm uses as the Himalayan glaciers melt erratically and the monsoon patterns shift. Landslides are very common in the hills and mountains in both developed and less developed countries. In addition to the primary cause due to topography, landslides are aggravated by human activities, such as deforestation, cultivation and industrial constructions. For example, in Nepal as many as 12,000 landslides occur each year as a result of combined actions of natural (mostly rainfall) and human factors (Kotter, 2003).

Environmental degradation and disasters causing population displacement and migration are very closely linked in many regions. The countries that suffer from various natural disasters are the same ones in which environmental degradation have been rapid. For example, damage assessment of the 2005 Tsunami concluded that there was significantly more damage to human lives and livelihoods where ecosystems, especially sand dunes, mangroves and coral reefs, had been disturbed. These areas saw severe population displacement. (IUCN, 2006). Similarly, poverty and vulnerability to disasters are also closely linked (Elahi, 1991). As a result, there is an average of some 3,000 deaths per event in less developed countries compared with less than 400 in middle and high income countries (Kotter, 2003).

## **Prospective Areas of Planning and Managing Population Displacement and Migration**

Institutional responses to the problem of EEE-induced migration at national, regional and global levels have been limited, although there has developed an increasing awareness of the severity of the



problem in recent years. The following issues deserve particular attention to deal with population displacement and migration as a result of EEE:

- Governments must undertake a comprehensive vulnerability analysis in EEE affected areas. This analysis should incorporate past disaster events and the socioeconomic conditions of the people who remained following the EEE, as well as those who chose to migrate. Risk assessment and hazard mapping would be an effective technique to undertake such an activity.
- Governments should formulate basic environmental contingency guidelines for post-emergency response locally, nationally and regionally. States should also institute EEE-reduction measures and ecosystem management policies at national and regional levels.
- In dealing with the effects of EEE on migration, the possibilities of spatial planning and land management have to be explored. Well-managed programs could even limit the tendency to migrate in case of EEE. The aim of this approach would be to use spatial planning to prevent the risks and mitigating the effects of EEE, thereby minimizing the potential flow of displaced and/or migrant population at local and regional levels.
- There is a need to increase the sense of responsibility of the international communities regarding (a) the possible impacts of the EEE having global relevance (as in the case of tsunami, global warming and sea level rise) to large scale demographic displacements and migration movements, and (b) the possibility of assisted migration and rehabilitation of vulnerable population to less densely and low risk areas in continents having lower population pressure.

## **Outlook for the Future**

The mobility, displacement and migration due to EEE still remained largely unexplored. These issues need to be effectively integrated into national economic and social development process. The development of a framework for such a level of cooperation

is an emerging issue in an age when issues of globalization are receiving increased attention. The concept of globalization should not focus exclusively on economic interests, but should encompass the social and demographic aspects of EEE.

Meeting the socioeconomic and demographic costs of mitigating the consequences of EEE having global implications (such as global warming, resultant sea level rise, and trans-boundary mega-hydrologic projects) should be the responsibility of the world community. This is because many smaller and less developed countries are not in a position to finance costly solutions to these problems. Also, there are many EEE that owe their origin to developed countries but whose consequences are borne by the less developed ones. Therefore, the demographic and related socioeconomic consequences should be viewed as global responsibility and the human migration factor should be treated as such. In this case, there are potential geopolitical benefits as well. For example, if we get our response to events like tsunami and climate change right, we can turn the tension over diminishing resources into a spur for regional cross-border cooperation (Beckett, 2007).

The important lesson for us should be that early planning is far more effective than managing the consequences of EEE and the resultant population dislocation and migration. A cooperative, preemptive approach would be consistent with the Millennium Goal: "to intensify our collaborative efforts to reduce the number and effects of natural and man-made disasters" (UNMD, 2005).

# **SESSION IV: THE IMPACT OF MIGRATION ON THE ENVIRONMENT**

**Keynote Address**

## **MIGRATION AND ENVIRONMENTAL CHANGE: FROM SCIENCE TO POLICY IN THE SAHEL REGION**

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### **Introduction**

This presentation is based on a project financed by the Canadian International Development Agency. Several Canadian organizations partnered with regional, national, and local African partners to conduct a study of how people interact with their environments in the Sahel region of Africa. Our case studies cover some communities in Burkina Faso, Mali, and Niger. In addition to exploring how migration affects the environment, we explored the relationships between different societies and the relationship of people to the environment in places where there had previously been a much lower population density.

## **Adaptive Capacity Project in the Sahel**

The Sahel region is the boundary zone in Africa between the Sahara desert and the more fertile regions to the south. Once composed primarily of grasslands, the Sahel is facing increased desertification due to extreme weather events, such as droughts and flooding, and climate variability in the form of decreased rainfall. There is a direct dependency on natural resources and environmental stability, and communities are highly sensitive to environmental change. Due to these ecosystem changes, there has been a range of social transformation, ranging from a change in adaptive capacities to migration, which is seen by the population as more of a problem or the result of failed adaptation.

The environmental sciences approach employed was an interdisciplinary attempt to explore the interaction between society and ecosystems. Our objective was to propose multi-level adaptive strategies instead of trying to define migration or displacement of people in a normative fashion. Through a series of interviews, we determined how issues related to climate science are symbolically and analytically organized in minds and daily lives of the local populace. From there, we generalized some observations to try and construct some kind of an explanation for how people react to ecosystem challenges.

Our research design included both qualitative and quantitative methods. In conjunction with local researchers, we conducted 576 interviews. We gathered sociological data and asked our subjects about perceived problems and solutions, whether a collective action framework existed, and extent to which communities had a base of knowledge about adaptation strategies.

Based on our finding, we defined and organized certain concepts. For example, we realized that, from both a science and policy perspective, it made little sense to analyse either the ecosystem or society independently of one another. We use the term socio-ecosystem to express that both societies and ecosystems affect one another. Finally, we tried to translate these concepts into action by suggesting multilevel adaptive strategies at the regional,

national, and local level. The indirect product of our work was to try to build capacities of local researchers and decision makers.

### **A Vulnerability Approach: Interactions between Nature and Society**

The relative vulnerability of a population in the face of climate change can be assessed by determining whether a community's adaptive strategies to changes in the ecosystem are successful. It was necessary to analyse state, local, and individual adaptive capacity, as adaptive strategies to ecosystem change involved actors from each level. We found that environmental/climate change and variability, combined with social transformations, made local populations more vulnerable.

The vulnerability of a socio-ecosystem is based on the degree to which an ecosystem is likely to be exposed negatively to climate variability, and the capacity of a social system to respond positively to climate variability. We found that individuals engaged in a variety of adaptive strategies in the face of ecosystem change, such as better land management strategies, stockpiling food, community solidarity, asking for outside help, or diversifying activities. Many sought help from family members in the city, and activities that were traditionally identified with a certain ethnic group, like herding or agriculture, has become less homogenous. All interviewees saw migration as a problem or a last resort rather than as a solution to ecosystem change.

Local populations perceived a range of problems, in addition to migration, as being associated with climate variability. Some examples include poverty, disease, food insecurity, biophysical phenomena like droughts and flooding, declining agricultural productivity, and social problems like conflict and family tensions.

## **Migration as an Adaptive Solution and Anthropic Pressures**

We can ask how migration affects the environment, but communities in the Sahel are operating wholly within an environment that is already depleted. Migration is associated with transformation of physical environment and social disorganization.

Mopti, Mali, is an interior delta and serves as the crossroad for four or five communities in a very small territory. The population has been growing steadily, but the area does not have the capacity to support that many people. As a result, fish stock is diminishing, small fisheries are replaced by commercial activities, and vegetable cover is observably disappearing year by year. How does that translate into daily life? Even with a weak ecosystem, people could rely on institutional support, but there is an incapacity of the institutional framework to manage conflict. Social tensions are therefore on the rise, as is deviant behaviour with regard to property and violence. This is where we hear about how the ultimate solution is to go somewhere else. An environmental refugee results from a situation when ecosystem can no longer support a population, and where the institutional framework cannot compensate. Where the socio-ecosystemic system cannot support minimal standards of living, the area becomes a powderkeg where something has to be done very quickly.

In Niger, agriculture is extremely important because of rapid population growth. Women have an average of twelve to sixteen children each, creating a huge strain on the ecosystem in spite of government programs designed to mitigate environmental degradation. In the past few decades, the trees that grew on cropland belonged to the state, so farmers had no motivation to protect trees. After much discussion, the government privatized trees, and the number of trees exploded. Now, trees are being protected, and the population uses the bark, fruits, and other products. The trees, in turn, retain water, change the climate, and have a positive impact on agriculture. The average number of children per woman, however, negates the productive capacity of the ecosystem. If you look at the environmental improvement

in isolation, the area is a model, but when you look at the social system, it is difficult to say that environmental improvements are enough. When look at dynamic between the two, the situation is critical.

## **Carrying and Caring Capacities**

The decision to stay or migrate is linked to the vulnerability of the socio-ecosystem and the place of the individual within that complex system. Vulnerability also refers to the carrying capacity of the ecosystem and the caring capacity of the social system. It is a dual way of looking at reality. When there is a population explosion and repetitious droughts, the diminishing capacity of ecosystem to sustain life, or the diminished carrying capacity, makes the situation critical. The existence of a unworkable subsistence economy causes people to flee toward the city. Migration can weaken social structures and can reduce social capital, or, in other words, can diminish the caring capacity. When there is a breakdown of both the carrying and caring capacities in an area, we are confronted with a bleak picture.

## **Implications for Policy Formation**

Institutions must look to create short, medium, and long-term solutions to climate change. Governments must build short-term capacities to deal with extreme weather events, like flooding. They must devise mid-range policies to deal with the effects of locust invasions and droughts. Finally, governments in affected areas must make long-term policies to deal with climate change in general.

How can we use our observations to create policy? How can we move from a scientific approach to a broader policy approach on issues like migration and the environment? Our team worked from an interdisciplinary perspective – we brought together biologists, agronomists, social scientists, and climate scientists. We realized that by bringing different groups together, we could

mainstream these issues into normal policymaking mechanisms. It is not necessary to invent a new sector of intervention within the public administration. Rather, we can use what is already in place and adapt it to the problem. To do so, we must introduce strategic environmental assessments to policymaking – much like environmental impact assessments – and ask ourselves how these problems might be dealt with, or how they might be affected by policies already in place. Essentially, we must underpin policymaking with a socio-ecosystem vulnerability outlook.

Some inroads have been made at different levels. We have to introduce into policymaker's minds the idea that we do not only have to deal with urban planning and agricultural policy, but we must also try to introduce a systemic approach into the discussion and types of projects that are being put forward. Most of the administration in Sahel region inherited a very rigid policymaking model that is difficult to change. What we can do is introduce in their functioning some sort of idea that a lawyer can talk to a climate scientist, or biologists with anthropologists, and emphasize that interdisciplinary dialogue will have positive effect. Lastly, we must ensure that there is community involvement on the local level. All policies rely on the participation of agricultural associations, local officials, traditional chiefs, and other categories of political actors. By engaging local society, we can help them construct some sort of discourse that might be the basis of their discussion with policymakers at the national and regional level.









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