GLOBAL WARMING AND HUMAN MIGRATION

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Keywords: Global warming, environment, migration, early warning, strategic environmental planning, carrying capacity, desertification, urbanization

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Summary

Migration is as old as humankind. It has always been and still is a very important coping mechanism for people to adapt to changed living circumstances. This can be a short-term regular occurrence, as part of a specific natural resource-based livelihood (e.g. pastoralism, seasonal movement of fishing communities) as well as a longer-term or even permanent phenomenon (e.g. shifting cultivation, conflict victims).
Global warming, if accepted as existing and of a progressive nature, would have a significant impact on the living environment of large populations. There is growing evidence that some of the more extreme climatic occurrences of the last 30 years, such as the cyclones in the Caribbean and the drought/flood cycles in Africa, have their roots in global warming. Sea-level rise, in particular, would have a huge and lasting effect on many highly populated regions in the world.
When climatic changes create unstable communities, people react by leaving their home areas in search of alternative livelihoods. When people decide to move, they become environmentally displaced persons. Some would simply call them “environmental refugees.” This terminology is, however, contested by those organizations that have governmental or intergovernmental mandates to assist refugees, such as the United Nations High Commissioner for Refugees (UNHCR).
The circumstances under which people leave their homes and migrate usually do little to explain the structural or root causes. There is a clear link between the number of environmentally displaced persons and the level of poverty in their home areas. Environmental pressures are often exacerbated by issues such as economic marginalization, insecurity, social upheaval, and political mismanagement. Global warming as an underlying factor for migration should therefore always be seen in the light of these aggravating socioeconomic factors.
When pushed by long-term environmental upheavals caused by global warming, people may move in different ways (i.e. as individuals, families, small groups, large groups, or massive crowds). They may try to find refuge within the region of origin, or move much further away. Their move may remain within the home country (i.e. internally displaced people) or they may cross international borders (i.e. international migrants or, if recognized, refugees). Besides the push factors (deteriorating environment at home), pull factors may also play a role. Some pull factors are economic opportunities, family, clan, or nationality reunion, and organized resettlement schemes.
The cost to society of environmentally induced displacements—especially if they are massive—can be huge, in both financial and human terms, because of the resultant social, political, and economic tensions. A refuge tactic seldom provides real solution but can often create new problems in the hosting areas, whether urban or rural. Prevention of out-migration seems in many cases the best

approach. Efforts should be undertaken to apply existing and technological potential to prevent environmentally induced displacement. This includes adequate risk assessment, vulnerability analysis, and countermeasures in the fields of infrastructure planning and project implementation, hazard monitoring, and structural strengthening of crucial infrastructure.

The carrying capacities of those areas that receive or "host" environmentally induced migrants are sometimes exceeded by the influx of new displaced persons, which can cause pressure on the local natural resource base, leading in turn to possible environmental deterioration and damage. It should be noted that there is evidence of a lower adverse impact on the local environment in the case of so-called "spontaneously settled" displaced persons than where people are settled in concentrated and highly populated situations.

1. Introduction

At the remote three-border mountain region of Uweinat (partly situated in Libya, Sudan, and Egypt), 3500-year-old rock engravings and paintings were found that represented a diversified pastoralist society. Because of climatic changes resulting in prolonged drought and desertification, these people had to take refuge away from the rich pastures in the plains into the still green mountains. When these areas also dried out and degraded, the people migrated to the Nile and to an area called Zolat, in northwest Sudan (see map, Appendix 1).

The images of livestock keeping found both in Zolat and Uweinat were of such a similarity (see rock engraving images, Appendix 2) and their datings of such a clear chronological sequence that archeologists concluded that the erstwhile lush pastures had pushed the Uweinat people into a southeastern (to Zolat) and western (to the Nile) migration. Climate change was here clearly a cause for permanent out-migration. As there are other such examples in ancient history, it could be concluded that in human history climate change has always been associated with migration.

The earth and its resources are under enormous pressure, and with a fast growing and unequally distributed world population—six billion in 1999—the strain is sharply increasing. Global warming is one important factor to contribute to environmental pressure. Stable and life-sustaining relationships between societies and their environmental and economic support systems are breaking down in many places. Huge numbers of people are struggling to survive in environmentally degraded areas and many of these see only one way out of their misery: leave home and seek better places to live with greater chances of survival. However, such a "refuge tactic" seldom provides real solutions; on the contrary, it often creates new problems in the hosting areas, whether urban or rural.

Some well-known examples of situations where environment and population displacement were intrinsically related are:

- The dust bowl in North America: a rapid desertification process mainly caused by exploitative agriculture systems
- The drying out of Lake Aral: caused by water diversion for large-scale irrigation schemes and perhaps climate change
- The Chernobyl nuclear accident: a human-made ecological disaster
- The Sahel drought and famine: a recurrent drought and desertification situation that, in relation to population growth, has transformed a huge arid zone into an extremely vulnerable region from which people seek refuge in southern, environmentally less depleted areas and countries (climate change is thought be one aggravating factor)
- The Rwanda conflict: a human drama that has its roots in ethnic conflict as well as in environmental degradation of the scarce natural resources in an overpopulated region
- Rural exodus in many countries, worldwide, in both industrialized and non-industrialized countries: a long-term environmentally induced process, often linked to decreasing economic security and climate change
- The structural insecurity in the Horn of Africa: a complex emergency with at its roots desertification, drought, conflict over land, war, and economic and political instability

In all these cases, environmental problems are to varying degrees the cause or the result of population displacements. Climate change often plays an inducing and aggravating role.
Global warming is not a limited, local problem, but concerns huge areas. Although rural population densities in affected regions may not always be high, such vast areas can nonetheless become large migrant-producing hinterlands for accessible cities. The numbers of people thus affected can be such that for many towns and cities global warming impacts may be the most significant cause of rapid urbanization.
In many cases, people uprooted for environmental reasons will look for alternative livelihoods elsewhere while at the same time remaining oriented towards both their areas of origin and their traditional way of living (off the land). Over-population and uncertain access to land and other natural resources will usually provide them, however, with little opportunity to reestablish themselves in other rural areas. Towns and cities therefore often become their last-resort solution.
Global warming is, then, a considerable rural–urban push factor. Such migration is furthermore strongly reinforced by pull factors from the towns and cities. Urban "realities" seen from rural areas may attract many, although the true situation—especially for those who arrive with little more than hunger and hope—may soon prove its incapacity to provide the hoped-for brighter future.
While these problems are occurring more frequently and on a larger scale, awareness of their extent and depth is also increasing. Studies are being initiated, meetings held, and a growing number of field-level projects undertaken (even if to date these address, in the main, damage already incurred).
There is a need for progress in two important areas. Firstly, *ad hoc* approaches—projects addressing only part of the problem—should give way to more strategic program planning and implementation. Secondly, preventive measures require much more attention as, particularly in cases of environmental degradation, early intervention has a significant cost-effective impact.
Practical guidelines will need to be developed to enable the agencies and governments concerned to act more effectively when they implement measures to prevent, mitigate, and rehabilitate environmental damage.

2. The Problem and the State of the Art

The huge weight of human numbers places enormous demands on the earth's resources. World population and resource consumption are rising across most of the globe, but patterns of population growth are far from even, and levels of consumption by no means mirror the distribution of people worldwide. Added to this, as an exacerbating factor, is global warming. Insecurity over available natural resources is often the result; this creates unstable communities who are ready to leave their home areas in search of alternative livelihoods. When people actually decide to move, they become environmentally displaced persons.
People should be encouraged to stay in their home areas. One important aspect that needs attention is the concept of carrying capacity (i.e. the number of individuals able to be sustained by a given area without severe damage to the eco-system).
Human intervention can decrease an eco-system's carrying capacity, or stretch it by technological advances. There are cases where the carrying capacity is exceeded to such an extent that the degradation process becomes irreversible. Rehabilitation of the eco-system then proves an extremely difficult and expensive, or even impossible, affair. Since, next to climate, the human factor is of paramount importance, practical ways of improving prevention, mitigation, and rehabilitation of environmental degradation need to be developed, with the aim of slowing down the process of environmentally induced population displacements.
The number of environmentally displaced persons worldwide in 1995 is estimated at 25 million. When environmental problems already predicted, such as flooding as a result of rising sea levels, drought and desertification, deforestation, chronic water shortages, soil degradation, and rapid urban development of megacities, are taken into account, the total number of environmentally displaced persons may well reach 200 million by the year 2010 (Myers and Kent, 1995). Improvements to current assessment mechanisms are needed to enable more accurate estimates of

numbers of environmentally displaced persons, as well as to provide the basis for more efficient monitoring and evaluation systems.

There is a clear link between the number of environmentally displaced persons and the poverty level of their home areas. The relation between environmental and other—human-made—problems depends on issues such as economic marginalization, insecurity, social upheaval, and political mismanagement. It is preferable for socioeconomic and ecological reasons to improve people's conditions in their home area rather than confront the problems of forced migration.

What needs more study are the deeper causes of mass population displacements, and the forms they take. The situational or circumstantial reasons for people leaving their homes do not very often indicate much about the structural or underlying causes.

Situational causes include drought, pestilence, disruption of food production activities, the collapse of government health services, etc. These circumstances can rapidly lead to disaster.

Structural causes include climate change and global warming, long-term processes and trends that exist within a society and in its relations with external communities, the world economy, and environmental degradation. These processes are political, social, economic, and environmental in nature and are usually inter-linked. They lead, over a long period, to major changes in situational conditions and so increase the risk of disasters, with the subsequent possibility of displacement.

An example of a study designed to understand the root causes of environmental degradation and mass migration is the 1991 World Conservation Union (IUCN) study on the Horn of Africa, *Fighting for Survival*, which examines how a shrinking resource base breeds insecurity, insecurity spreads conflict, and conflict causes environmental degradation, thus establishing a pattern that has resulted in the deaths of millions of people and the displacement of many more. The study concludes that: "Governments must be encouraged to understand that diversity is the central pillar of sustainable development" and "The problem now facing environmental strategists and development planners operating in the Horn is not only to reach a consensus on what is out of balance and why, but also to put in motion the process of achieving environmentally sustainable development policies that embrace diversity, and then put these policies into practice."

People who are migrating for environmental reasons fall outside the categories protected by instruments of international refugee law, both in terms of the text and intent of the drafters, and in terms of much current practice. International recognition of environmentally displaced persons as a vulnerable group in need of particular assistance may now be seen as desirable.

It is only recently that researchers have begun to address the question of environmentally induced population displacements. The results of both field studies and global research are increasingly available. Studies, results of which may be of direct use to agencies and governments, need to be connected to the implementation of agencies' and governments' programs in this field. Examples of field projects specifically addressing the problems of environmentally induced population displacements need to be documented. The experiences of such programs may help in developing measures for prevention, mitigation, and rehabilitation. Results of meetings, workshops, and conferences that contributed to the development of the present understanding of, and responses to, this problem will need to be compiled and widely disseminated.

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Appendix 1. Map: Environmentally induced migration of pastoralist society from Uweinat to Zolat (2000 to 1500 BCE)
(*Source*: Paul Huard and Léone Allard-Huard)

Appendix 2. Rock engravings: (i) Ox, discovered in Uweinat by Rhotert, 1952; (ii) Ox, discovered in Zolat by Rhotert, 1952
(*Source*: Paul Huard and Léone Allard-Huard)

Biographical Sketch

Hermen Ketel has since 1974 been active in the fields of environment, sustainable development, and humanitarian relief. He has worked as an advisor to farmers in developing countries, managed field projects, and developed national and regional programs, and has been involved in several studies related to environmental issues, such as desertification, insecurity and environment, urbanization and migration, national environmental planning, and environmental education and awareness-raising. He has organized and facilitated several national and international seminars and symposia on the environment. Since 1992, Mr. Ketel has worked as an independent consultant for United Nations agencies (UNHCR, UNDP, IOM, UNOPS, UN-CCD), environmental organizations (IUCN, Green Cross), and international nongovernmental organizations (International Federation of Red Cross Societies, CARE, OXFAM, Lutheran World Federation, ACT-International). Much of his work is done in Sub-Saharan Africa, through assignments aimed at strategic program planning, reviews, field studies, and environmental assessments. He has been involved in an advisory role in environmental policy development with several international agencies, including the UNHCR.