



Climate Change and Migration

Study Team on Climate-Induced Migration

June 2010

Summary: This paper analyzes the likely intersections between climate change, migration and conflict. The paper identifies some of the most relevant factors that might turn environmentally induced migration into a source of conflict and hold major implications for receiving areas.

Scientific literature is still inconclusive about the conflict potential of environmentally induced in-migration and the mechanisms potentially linking it to conflict onset. In general, such mechanisms tend to apply more often in cases of conflict induced as opposed to environmentally induced migration. In a possible chain of events leading from environmentally induced migration to conflict in a receiving area, a host of other factors comes into play, including the causes and type of migration and responses to and perceptions of migration. The impacts of current and future climate trends are likely to increase the pressures that trigger environmentally induced distress migration and migration as a means of adaptation to environmental change. At the same time, climatic and non-climatic factors further strain governance capacities and weaken the stability and the natural resource base of receiving communities, thus making it harder for them to respond to migration appropriately.

Consequently, governments and donors need to invest in (a) extending the knowledge base, for instance by conducting long-term case studies, and (b) supporting mechanisms for receiving communities in devising migration governance strategies based on this knowledge.

Climate Change, Migration and Conflict: Receiving Communities under Pressure?

by Andrea Warnecke, Dennis Tänzler and Ruth Vollmer

In predictions and scenarios on potential security risks arising from climate change, large-scale population movements and their consequences for receiving areas figure prominently among the assumed threats. As early as 1985, El-Hinnawi listed large-scale distress migration as one of the foremost potential security risks resulting from anthropogenic climate change.

While it is generally acknowledged that each of the factors might in turn reinforce or exacerbate the others, several authors have sought to identify direct and indirect linkages between environmental change, migration and conflict more specifically. The so-called *direct pathway* assumes that environmental stressors might cause large-scale displacements thereby generating conflicts in receiving areas. By contrast, the *indirect pathway* posits that environmental stressors might lead to conflict which in turn causes migration and the “export” of the conflict to receiving areas (Gleditsch et al., 2007; Salehyan and Gleditsch, 2000; Suhrke, 1997).

Most of the existing research has focused on linkages between environmental triggers (including climate change) and migration in the *sending* areas. In this context, it is also impor-

tant to note that migration in response to climate change is an important and often positive adaptation strategy for affected communities. For instance, it can help diversify the sources of household incomes, which would otherwise mainly or exclusively depend on their surrounding habitat.

The following paper takes the suggested direct pathway as a starting point and seeks to disaggregate the nexus between environmentally induced migration and the scope for conflict in receiving areas. It is based on the assumption that both the scope for conflict and, more specifically, the propensity for violence in receiving areas are contingent upon a variety of accompanying factors, including the different types and determinants of environmental migration as well as contextual factors and adaptive capacities in receiving areas. Following a review of the existing research and conceptualizations on environmental migration and conflict in receiving areas (section 1), the second section will identify and discuss factors, conditions and capacities that might influence the propensity for violence. The paper concludes with an assessment of potential challenges associated with future climate change and their likely impact on the overall stability in receiving communities.

Environmental migration and conflict: empirical evidence and the state of research

Notwithstanding the existence of some estimates on environmentally induced migration, one of the major challenges still lies with the identification of receiving communities with large numbers of immigrants who migrated mainly due to environmental reasons, as opposed to other push factors. According to Reuveny, migration which has (inter alia) been induced by environmental change is likely to be most prevalent in areas that are at the same time affected by severe environmental problems and are highly dependent on the environment for livelihood, such as in developing countries in Asia, Africa and Latin America (Reuveny, 2007). Based on existing data on environmentally induced migration, it can be assumed that large-scale forced or distress migration related to environmental change to date tends to be internal, regional and temporary (Kolmannskog, 2008: 21). Recently, there is also an increase in rural-urban migration, of both a temporary or permanent nature. By contrast, international migration as a result of natural disasters is possible but less prevalent (Raleigh et al., 2008: 2).

Some studies have argued that there is a potential for conflict over scarce resources in the wake of environmental migration. According to Homer-Dixon, population growth and resource depletion resulting from large-scale environmentally induced immigration might offset existing (ethnic, political or economic) balances and increase the propensity for armed violence especially in weak or fragile receiving states (Homer-Dixon, 1991, 1994). The argument has also been supported by Matthew according to whom migration poses a “key linkage” between the scarcity of renewable resources and the risk of violent conflict (Matthew, 2008). Likewise, the German Advisory Council on Global Change (WBGU) highlights the potential of environmentally induced migration to foster conflict by contributing to ethnic imbalances and resource depletion in receiving areas especially in cases of large-scale, rapid population influxes (WBGU, 2007; see also Black and Sessay, 1997 and the

UNHCR’s Environmental Guidelines, 1996). In the international political discourse on climate change, the so-called “migration link” between climate change and increased conflict risks has repeatedly been alluded to as one of the foremost threats to human and state security.¹

Notwithstanding the prevalence of resource scarcity and competition in many affected areas, several researchers have questioned to what extent scenarios regarding environmental migration and conflict are sufficiently backed up by empirical evidence. In a paper commissioned by the World Bank, Raleigh et al. emphasize that “[m]uch of the available literature exaggerates the impact of environmental factors in causing or exacerbating conflict” and that “[a]lthough migrants are frequently cited as catalysts, instigators or victims of conflict, case study literature is inconclusive regarding the propensity of migrants to exacerbate tensions and conflict” (2008: 34). From a methodological perspective, it is extremely difficult to identify migrants that have left their homelands solely due to environmental stressors. While different definitions and conceptualizations of “environmental migrants” or “environmental displacees” have been put forward,² environmental stressors are rarely to be understood in isolation as causes for movement (Afifi and Warner, 2008; Reuveny, 2007; Homer-Dixon, 1999) and thus have to be carefully balanced with additional concurring factors.

Conflict potentials in receiving areas

Most research that has been carried out on mechanisms potentially turning migration into a cause of conflict in receiving areas focuses on refugees’ role in the spread of civil war. Here, too, empirical evidence on increased conflict potentials in receiving areas is rather ambiguous, especially with regard to the exact mechanisms at play. Salehyan and Gleditsch (2006) identify three conflict-generating mechanisms:

1. Resource competition between refugees and local communities,

¹ Cf. among others former Foreign Secretary Margaret Beckett (UK), according to whom “an unstable climate risks some of the drivers of conflict such as migratory pressures (...) – getting worse” (quoted in Kolmannskog, 2008: 18); and “Perhaps the most worrisome problems associated with rising temperatures and sea levels are from large-scale migrations of people – both inside nations and across existing national borders,” Campbell, Kurt M. et al., (2007) *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*, Center for a New American Security, Center for Strategic and International Studies, available online via http://csis.org/files/media/isis/pubs/071105_ageofconsequences.pdf.

² Renaud, Fabrice et al. (2007) *Control, Adapt or Flee. How to Face Environmental Migration?* UNU EHS InterSecTions 5 (2007), available online via www.ehs.unu.edu/filehp?id=259; Biermann, Frank. (2001) *Umweltflüchtlinge. Ursachen und Lösungsansätze*. Bundeszentrale für politische Bildung: Bonn.

2. Ethnicity and cultural differences between refugees and local communities and
3. Refugees as active or passive resources for parties of the conflict in cases where refugee camps are used as recruitment base or hiding ground for combatants.

In sum, Salehyan and Gleditsch have found statistically significant evidence for an increase in the onset of conflict by one-third in receiving communities in Africa hosting large numbers of civil war refugees from neighboring countries. In their statistical assessment of individual mechanisms linking refugee camps to conflict onsets in Africa, Weidmann et al. (2007) have not found any empirical evidence to link the increased risks for conflict in receiving areas to the direct involvement of refugees. With a view to Salehyan and Gleditsch's findings, Weidmann et al. recommend including additional mechanisms at the micro level such as ethnicity, type of refugees in a camp, militarization among refugees, and so forth in future assessments. Likewise, Lischer (2002) suggests addressing additional influencing factors based on her comparison of violent and non-violent refugee situations, including "the level of political cohesion and militancy among the refugees; the capacity and will of the host country government to demilitarize camps; and the extent to which third parties provide resources to militant refugee groups" (quoted in Whitaker, 2003: 214).

Specifying the role of environmentally induced migration

Based on a comparative assessment of 38 cases of environmentally induced migration in the second half of the 20th century, Reuveny (2007) found that half of the cases did not display any sign of violence or conflict, while the other half resulted in some kind of violence, if often rather unorganized or partly attributable to non-migration forces. Similar to Salehyan and Gleditsch, Reuveny argues that conflict in receiving areas is more likely when environmental migration is coupled with one or more of the following mechanisms: competition for resources and economic opportunities, distrust between the area of origin and the host area as well as the exacerbation of socioeconomic fault lines (Reuveny, 2007: 659). According to his research, existing tensions or conflicts between social groups and additional "auxiliary conditions," i.e. political (in)stability and the capacity to manage migration and absorb migrants in the

receiving areas, play an important role as well (ibid.; see below, section 3). Reuveny concludes that "severe environmental problems play a role in causing migration, which, at times, leads to conflict in receiving areas." (ibid.: 657). Although this statement is very carefully put, Reuveny's case study assessment does not account for the relative importance of additional conflict causes or intervening factors.

Diffusion and escalation

In an effort to further refine existing conceptualizations, Whitaker (2003) points out that "most analyses fall short of fully articulating the mechanisms through which each contributing factor leads to the spread of conflict" (ibid: 213). For this reason, she suggests a comprehensive categorization of the potential interlinkages between in-migration and conflict by distinguishing between *diffusion* and *escalation*. *Diffusion* describes changes in the balance of power within the receiving country through in-migration, for instance, by altering the ethnic composition of the population or affecting access to resources and land. *Escalation* summarizes the processes through which a conflict in the sending state can spread into or affect the receiving area, e.g. when combatants use migrant-inhabited areas for retreat and mobilization. According to this categorization, the indirect pathway between environmental change, migration and conflict presented above exemplifies a process of *escalation*, while the direct pathway exemplifies a case of *diffusion*, i.e. a possible disturbance of ethnic, religious and other balances or increased competition over resources, participation and land in the wake of large-scale environmental in-migration.

Patterns of conflict

Another methodological and conceptual issue refers to the need to distinguish different incidences of (violent) conflict emanating from large-scale forced or distress immigration according to their frequency, intensity and persistence (Lischer, 2002). As early as 1994, a team of researchers at ETH Zürich pointed out that the *type* of conflict potentially induced by "environmental flight" largely depends on different factors, such as the number of people affected, their routes and their destinations (Bächler and Rittri, 1994).

In addition, it is important to note that conflict patterns resulting from political or conflict-induced migration, such as in the cases of Burundi, Colombia or Sri Lanka, are

markedly different from the kinds of violence or conflict that might stem from large-scale environmentally induced migration (Gleditsch et al., 2007: 5-6). While there are some documented incidences of refugees or migrants “importing” conflicts into their receiving community, especially in the case of movements between neighboring countries, environmental migrants appear to be considerably less likely to get engaged in organized violence. In contrast to intensified or organized armed violence related to conflict-induced migration, recent studies suggest that environmental migration will most likely lead to short-term sporadic tensions and low-intensity forms of violence (Gleditsch et al., 2007: 6). In this context, Martin (2005) highlights the relevance of mutual perceptions among host and refugee communities when trying to assess the likelihood of (violent) conflict in receiving areas. He particularly warns of simply presupposing causal relationships that are exclusively based on an assessment of actual benefits or disadvantages for the affected communities.

To date, insufficient empirical data on these accompanying factors and determinants has hampered a sound and thorough appraisal of the security implications emanating from environmentally induced migration. Bearing in mind these limitations, there is a need to frame future trends by providing an overview of the different repercussions that climate change in combination with other factors may yield in receiving communities. To begin with, we outline which capacities, responses and framework conditions in receiving communities as well as the relevance of host and migrant relations in receiving areas need to be considered when the local repercussions of migration flows under climate change conditions are assessed.

Doubtlessly, migration is one of several possible alternatives that people can resort to when faced with environmental degradation or disasters that threaten their livelihoods. However, it is yet “unclear what form such migrations will take” (Raleigh et al., 2008: 1). This depends inter alia on “regulations regarding land use, migration policies, and migrant assistance in receiving areas” as set up by governments and international agencies (ibid.). In fact, in the literature on the repercussions of environmentally induced migration on receiving areas, it is quite common today to note that “the conflict potential of migration depends to a significant degree on how the government and people in the place of

transit, destination or return respond,” as Kolmannskog says (2007: 21). For this reason, the following chapter will provide an overview of the types and forms of environmental migration as well as the capacities and responses in receiving areas, all of which might mitigate or exacerbate the propensity for violence.

Political stability, governance capacities and the availability of resources in receiving areas

To accommodate large-scale migration movements, a number of prerequisites are considered to be essential (WBGU, 2007: 119): the overall political stability, governance capacities and the availability of resources, as well as a host of additional factors, such as demographic trends, migration networks and ethnicity. This already indicates that capacity has to be considered as a framework concept that needs to be further specified.

The assessment of political, social and economic capacities to deal with crisis events has gained some prominence in the course of the overall debate on climate change adaptation (see Taenzler et al., 2008). In general, different sources of capacities and sensitivities need to be taken into account to assess the overall susceptibility of states to crisis events. In this view, capacities depend on the interplay of a number of elements such as the social reach of governments, their problem-solving capacities, wealth, economic sensitivity or the degree of social integration. Livelihood sources of poorer communities are usually limited and more climate-sensitive than those of wealthy or industrialized states. Societies have begun to develop a number of mechanisms to cope with extreme weather events they occasionally face. Examples of such coping strategies are the precautionary storage of food, trade but also migration itself.

Political stability and history of conflict

The issue of political capacity is closely related to the aspect of stable political affairs and the discussion of weak or even fragile states (Schneckener, 2004). Fragile states are often considered to be barely capable of performing key state functions and displaying only very limited governance capacities. The extreme case of the fragile state is the collapsed or failed state, one that has come to represent only a geographical entity. Most often these states are associated with

an existing history of conflict. In an atmosphere of mistrust towards state institutions, societal groups are more likely to regard violence as a more expedient strategy than peaceful conflict transformation. States in post-conflict or crisis situations are most vulnerable to escalating conflicts.

Whitaker (2003) also refers to the overall political stability in an analysis of the likelihood of conflict resulting from migration processes. On the basis of case studies of the Democratic Republic of Congo (DRC) (the former Zaire) and Tanzania in the 1990s, she compared the situation in both countries when refugee flows from Rwanda had to be accommodated. In DRC, the collapsing political system facilitated a climate in which opposition groups and rebel movements could easily gain momentum to struggle against dictator Mobutu. By contrast, in Tanzania economic reform and political democratization processes had been initiated which facilitated widespread legitimacy of the government. As a result, Tanzania was more capable of providing a stable political environment for refugees than the DRC. Of some importance in this context was also the ethnic dimension, since the case of the DRC also indicates a high level of politicization of ethnic identities in the host country which may contribute to violence and instability in the course of large-scale immigration.

Governance capacities

Already today, many potential receiving areas suffer from weak capacities to provide key services to their population. In this regard, health and education as well as access to affordable and reliable energy and water services are essential and deficits are accordingly considered incidents of poor governance (see, e.g., Brown, 2008; Carius et al., 2008: 17, 32). If governance is poor, socially exclusive or not geared towards development, building purely technical capacities may have scarcely any positive effect. On the contrary, if it benefits only limited parts of society it may trigger social tensions. There are examples of violence in connection with migration movements, e.g. in Bangladesh (Chittagong Hill Tracts) in the 1980s, or in Mali and Mauritania (Senegal River Valley) in 1989-1990, indicating that the state favored migrants over other social groups, thus fuelling conflict instead of fostering accommodation (Suhrke, 1997: 264-26 quoted in Haldén, 2007). However, this seems to be the exception rather than the rule.

The case of Mali

As Christian Aid has illustrated, receiving communities sometimes need to deal with considerable numbers of migrants (Christian Aid, 2007). In the case of Mali, decreasing and less predictable rainfalls have led to worse harvests. The farmers' turn to the country's cities in search of a job, especially to the nation's capital, Bamako, led to a population increase from 600,000 around 20 years ago to roughly 2 million nowadays. The precarious conditions of the newcomers significantly contribute to overall insecurity and the spread of diseases such as HIV.

Additional overstretch of institutional governance structures in developing countries is likely to be a prime effect of climate change (Carius et al., 2008: 32-33). This diminishes the capacity of societies to steer policy processes and hampers the execution of elementary state tasks. Particularly if disastrous events occur, there is an additional risk of the loss of legitimacy of state institutions.

As a result, state performance in general and mechanisms of civil conflict transformation in particular are weakened.

To find employment, affordable housing, and access to social services such as health care are major challenges to both displaced and receiving communities. For displaced populations it is even more difficult to provide adequate medical care and vaccination programs. As a result, infectious diseases pose a greater risk and are more likely to end deadly. Displaced populations are usually more likely to suffer from these conditions than settled populations.

Availability of natural resources

Climate change impacts, population dynamics, as well as migration can affect the availability of natural resources due to additional stress on already degraded lands and competition for scarce resources in both rural and urban settings. Many regions throughout the world are likely to face severe resource degradation due to unsustainable resource use in combination with population growth and urbanization patterns, e.g., in coastal areas. One side effect of this development is the expansion of slums without appropriate infrastructure. These areas are often referred to as breeding grounds for conflict and organized crime. However, urban slums are seldom places witnessing large-scale collective

violence. The rapid migration to mega-cities around the world is nevertheless a major barrier to development. Refugees living in urban areas are highly susceptible to the impacts of climate change, especially to extreme weather events, such as flooding or storms due to the marginalized situation (Haldén, 2007: 277).

Slow vs. rapid-onset of environmental stressors

Finally, the capacities in receiving areas to deal with migration flows are likely to be influenced by the nature of the environmental disruption. Bates (2002: 469-470) distinguishes between three categories: disasters, expropriations and deterioration. Climate change impacts can mainly be related to the first and the third category. According to Bates' definition, disaster refugees either flee from natural disasters or technological accidents. Deterioration refugees migrate as a result of gradual, anthropogenic changes in their environments, i.e., from ecosystems that have gradually degraded to a degree that makes survival based on the local resource base impossible. Similar to Bates, but referring particularly to environmentally induced migration, Lonergan (1998) distinguishes between rapid- and slow-onset events. According to his conceptualization, rapid-onset events are, for instance, natural disasters such as flooding, volcanoes, earthquakes and droughts in sending areas. On the other hand, slow-onset changes are environmental processes occurring at a slower rate which might additionally interact with human activities, such as deforestation, land degradation, erosion, salinity, desertification or climate warming. Most recently, the EACH-FOR project has taken up earlier categorizations suggesting a general distinction between slow-onset environmental stressors such as water scarcity, desertification, soil degradation or deforestation, and rapid-onset environmental stressors including extreme weather events such as flooding and cyclones (EACH-FOR, 2008: 3).

Whether an instance of environmentally induced migration is triggered by a rapid- or a slow-onset event is likely to hold implications for receiving areas. The type of stressor partially determines the degree of voluntariness of the move and the duration of stay, as well as the size and dimension of a migratory movement (Gallagher, 1994). These factors can be related to the propensity for violence and conflict in receiving areas; therefore, they also play a role in defining the appropriate response. Against this background, governments should take into account the types of stressors

and how they frame migratory movements when assessing their capacities and developing their strategies to manage future environmentally induced migration. Climate change will cause rapid and slow onsets of environmental stressors alike. Scenarios suggest that a number of regions will be affected by ongoing land degradation and a more frequent and more intensive occurrence of extreme weather events at the same time.

Presenting the case of Western Tanzania, Berry (2008) illustrates how large-scale dislocation of people can adversely impact the environment in the receiving areas. This is especially due to the scale and suddenness of refugee flows which can rapidly change a situation of even relative abundance of local resources to one of acute scarcity. Although environmental management protection projects were conducted in Western Tanzania, the long-term presence of more than 400,000 refugees has contributed to widespread deforestation, depletion of water resources, soil erosion and the loss of wild animal habitat. A further example in this regard is the case of the Petén region in Guatemala which received substantial migrants from elsewhere in Guatemala resulting in massive deforestation in that region since the 1970s. The migrants cleared large parts of the forest in order to establish new subsistence farmland (IOM, 2009: 157). Such a diminishing resource base can create tensions between host and refugee communities – a trend additionally triggered by more frequent incidence and longer duration of droughts and in regions where local infrastructures, employment opportunities and social services are already stretched.

Future trends: climate change and beyond

As shown above it is important to avoid one-dimensional causal explanations when assessing whether there will be an increase of tensions or even violent conflicts due to environmentally induced migration in receiving areas. At the same time, the existing empirical evidence for violent consequences of migration as a result of environmental degradation is only of limited explanatory value when it comes to the assessment of the likelihood of future conflict constellations under changing climate conditions (Haldén, 2007: 130). The German Advisory Council on Global Change (WBGU) assessment in "Climate change as a security risk," suggests that climate-induced environmental stress is increasing to a considerable extent. This brings about a

number of consequences for human livelihoods, which can mutually reinforce one another. The massive impacts of climate change on the availability of water and on food production as well as the impacts of extreme weather events, i.e., rapid as well as slow onset of environmental stressors, will result in far-reaching migration flows (e.g., CSIS, 2007; Haldén, 2007: 120-132).

It is worth briefly describing to what extent some of the main drivers influencing global, social and economic development are going to change in the upcoming future in order to illustrate the scope of the challenge ahead. The potential impacts of climate change as outlined in the most recent IPCC report from 2007 are likely to reach a fundamentally new quality with respect to water availability, agricultural productivity, and the frequency and intensity of extreme weather events (IPCC, 2007). Some of the most worrisome trends are summarized in the box below:

Selected future climate change trends

- **The availability of water will decrease in absolute terms as a result of global warming.** By mid-century some regions, including the MENA region and southern Africa will see a decline of between 10% and 30% (IPCC 2007: 5; IPCC 2007: 183). Figures for the proportion of the world's population that will suffer as a result of water stress⁷ range from 262 million to approximately three billion by 2080 (IPCC 2007: 194).
- **Extreme weather events will cause considerable economic damage** (WBGU 2007: 69) and may also have a negative impact on water quality and contribute to the spread of epidemics (IPCC 2007b: 179). This could reach a level at which local water supplies will no longer be suitable for use as drinking water without technical and financial input (IPCC 2007: 187). Additionally, sea-level rise will lead to groundwater and river water salinity in coastal regions.
- **Food availability will decrease.** If global warming rises to 3 °C it is likely that the number of people suffering from hunger will increase by 250 million to 550 million (Stern 2006: 72). Over the course of the coming decades, there will be a substantial decline in food production. Prices will rise as a consequence of this (IPCC 2007: 276, 300; WBGU 2007: 94). In the long term, there may be an increase in land use competition between food and energy crops (IPCC 2007: 278, 281).

All these trends are likely to also affect the overall capacities in receiving areas and may diminish the ability to accommodate migration flows fleeing from environmental degradation or due to other reasons. At the same time, the changes of environmental conditions are not the only worrisome trend forecasted for the next centuries. The significance of impending climate change in terms of security policy and its conflict relevance only fully comes to light through the interplay between the environmental developments described above and other global trends. In particular, population growth, urbanization and global economic development will occur alongside climate change and may in some cases have a markedly intensifying impact on existing and future conflict constellation also in receiving areas. Accordingly, a number of sectoral developments need to be considered if the potential effects of migration in receiving areas are to be assessed appropriately.

The danger of converging trends

Climate changes, as outlined in this chapter, may multiply the menacing effects of deficits such as social and economic injustice, little or no rule of law, and so on. A plausible result is that countries and regions that are themselves affected and weakened by climate change have to accommodate sizeable displaced communities. Most likely, they may face the difficulty of both accommodating refugees and providing a stable political environment. This, however, does not mean that such trends will automatically lead to violent conflicts – especially when measures to counter such trends will be taken in due time.

- **Demographic trends:** Population growth will lead to a world population between 8.7 and 9.3 billion people by 2050 at the latest. In regional terms, this will be reflected particularly in the population dynamics in Africa, which is set to grow from 900 million (2005) to nearly 2 billion (2050), and in Asia, where the population will grow from 3.9 to 5.2 billion (United Nations Population Division (UNPD), 2006).
- **Urbanization:** By 2030, up to 60 percent of the world's population could be living in cities. The largest growth in city populations – nearly 50 percent – is expected to occur in Africa and Asia (UNPD, 2006). In 2005, 72 percent of the urban population of Sub-Saharan Africa and 56 percent in South Asia lived

in slums (UN Population Fund (UNFPA), 2007: 16). Every third city dweller will be forced to live in slums in the year 2030 according to UN Habitat: this means up to 2 billion people without an adequate basic infrastructure (UN Habitat, 2003: 1, 24).

Conclusions

To sum up, previous research suggests that refugees and migrants create new alignments and transform old ones when entering into an established political setting in receiving communities (Whitaker, 2003). Conflict results in some cases, while in others it does not. In other words, a worsening of situations and the triggering of conflicts as an indirect result of climate change is only one possible scenario: the peaceful avoidance of new conflict situations is another, especially when migration in receiving areas is properly managed.

In addition, it is important to note that violent conflict is usually a result of several interrelated causes and can hardly be traced to a single causal explanation. Especially in cases of large-scale migration, additional exacerbating factors are of utmost importance, which might serve to diffuse or escalate conflicts in receiving areas. For instance, as argued above, large-scale migration can affect the balance of power within the receiving country, or conflict in the sending state can spread to the receiving area. In the light of climate change forecasts and other major global trends, past evidence may not be a useful guide for responses to future challenges. At the same time, there is a need to conceptualize security in the broader sense of human security to frame the adaptation and accommodation needs in politically unstable regions. Building on existing empirical evidence, different possible pathways can be identified. Migration and conflict, the capacities in receiving areas to manage large-scale migration, as well as future trends in climate change, will influence these pathways. After reviewing existing knowledge, the following priorities appear to be essential for future research and policy development:

1. There is a strong need to identify those regions that will most likely be a receiving area in the future and that already today face highly volatile situations with respect to conflicts and tensions. They may themselves be sub-

ject to increased environmental stresses and have only limited capacities to deal with large-scale migration flows. For this reason, long-term case studies that take into account both the specific challenges arising from environmental migration and the absorption and governance capacities of individual receiving areas should be undertaken.

2. Receiving communities need to be supported when devising strategies that aim to control and manage rising migration flows. Trends of rapid and slow onsets of environmental stressors will possibly occur at the same time. Accordingly, different kinds of response mechanisms (e.g., disaster management vs. long-term adaptation planning) need to be established in the receiving areas. International donors need to address the challenges to provide a sustainable management of the natural resource base, to avoid risks of instability in the future, and to control the costs needed for appropriate capacity building. These efforts demand political leadership and financial assistance to build up the institutional and bureaucratic capacities.
3. The establishment of a global adaptation regime under the framework of the UN climate negotiations is only one step in this direction. In addition, the challenge of accommodating future migration flows in receiving communities under the conditions of climate change needs to be addressed by the international donor community in general.

References

- Afifi, Tamer, and Koko Warner (2008) *The Impact of Environmental Degradation on Migration Flows Across Countries*, Working Paper No. 5/2008, Bonn: UNU-EHS.
- Bächler, Günther, and Catherine Schiemann Rittri (1994) Einleitung. Umweltflüchtlinge als Konfliktpotenzial. In: Günther Bächler (Ed.), *Umweltflüchtlinge. Das Konfliktpotential von morgen?* (Environmental Refugees: A Potential for Future Conflicts?) Münster: Agenda Verlag.
- Bates, Diane C. (2002) "Environmental refugees? Classifying human migrations caused by environmental change," *Population and Environment*, 23(5): 465-477.

- Berry, Leah (2008) "The impacts of environmental degradation on refugee-host relationships," *African Security Review*, 17(3): 125-131.
- Biermann, Frank (2001) *Umweltflüchtlinge. Ursachen und Lösungsansätze*, Bonn: BpB.
- Brown, Oli (2008) *Migration and Climate Change*, IOM Migration Research Series No. 32, Geneva: International Organization for Migration (IOM).
- Brown, Oli, and Robert McLeman (2009) "A recurring anarchy? The emergence of climate change as a threat to international peace and security," *Conflict, Security & Development*, 9(3): 289-305.
- Carius, Alexander, Dennis Tänzler and Achim Maas (2008) *Climate Change and Security: Challenges for German Development Cooperation*, Eschborn: GTZ.
- Christian Aid (2007) *Human Tide: The Real Migration Crisis*, available at <http://www.christianaid.org.uk/Images/human-tide.pdf> [December 5, 2009].
- CNA (2007) *National Security and the Threat of Climate Change*, Alexandria, VA.
- Coemenetz, Joshua, and César Caviedes (2002) "Climate variability, political crisis and historical population displacement in Ethiopia," *Environmental Hazards*, 4(2002): 113-127.
- CSIS (2007) *Foreign Policy and National Security Implications of Global Climate Change*, Washington D.C.
- EACH-FOR (2008) *Preliminary Findings from the EACH-FOR Project on Environmentally Induced Migration*, Environmental Change and Forced Migration Scenarios Project, www.each-for.eu.
- El-Hinnawi, Essam (1985) *Environmental Refugees*, New York: United Nations Publications.
- Gallagher, Dennis (1994) "Environment and migration: A security problem?" In: Günther Bächler (Ed.): *Umweltflüchtlinge*.
- German Advisory Council on Global Change (WBGU) (2007) *World in Transition: Climate Change as a Security Risk*, London and Sterling.
- Gleditsch, Nils Petter, Ragnhild Nordas and Idean Salehyan (2007) *Climate Change and Conflict: The Migration Link*, Coping with Crisis Working Paper Series, International Peace Academy.
- Harpviken, Kristian Berg, and Sarah Kenyon Lischer (2009) "Refugee return and violence: An analytical framework," ISA unpublished paper.
- Haldén, P. (2007) *The Geopolitics of Climate Change: Challenges to the International System*, Stockholm: Swedish Defence Research Agency, FOI.
- Homer-Dixon, Thomas (1991) "On the threshold: Environmental change as causes of acute conflict," *International Security*, 16(2): 234-260.
- Homer-Dixon, Thomas (1994) "Environmental scarcities and violent conflict: Evidence from cases," *International Security*, 19(1): 5-40.
- Intergovernmental Panel on Climate Change (2007) *Climate Change 2007: Impacts, Adaptation and Vulnerability*, Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, Summary for Policymakers, available at <http://www.ipcc.ch/SPM13apr07.pdf> (November 30, 2009).
- International Organization for Migration (2009) *Migration, Environment and Climate Change: Assessing the Evidence*, by Frank Laczko and Christine Aghazarm (Eds), Geneva: IOM.
- Kolmannskog, Vikram Odedra (2008) *Future Floods of Refugees: A Comment on Climate Change, Conflict and Forced Migration*, Oslo: Norwegian Refugee Council.
- Loneragan, Steve (1998) "The role of environmental degradation in population displacement," *Environmental Change and Security Project Report*, 4: 5-15.
- Matthew, Richard A. (2008) *Resource Scarcity: Responding to the Security Challenge*, International Peace Institute.

Martin, Adrian (2005) "Environmental conflict between refugee and host communities," *Journal of Peace Research*, 42(3): 329-346.

Raleigh, Clionadh, Lisa Jordan and Idean Salehyan (2008) "Assessing the impact of climate change on migration and conflict," paper prepared for the Social Dimensions of Climate Change workshop, commissioned by the World Bank.

Renaud, Fabrice, Janos J. Bogardi, Olivia Dun and Koko Warner (2007) *Control, Adapt or Flee: How to Face Environmental Migration?* UNU EHS InterSecTions 5 (2007), available online at www.ehs.unu.edu/file.php?id=259 (December 20, 2009).

Reuveny, Rafael (2007) "Climate change induced migration and violent conflict," *Political Geography*, 26: 656-673.

Salehyan, Idean (2008) "From climate change to conflict? No consensus yet," *Journal of Peace Research*, 45(3): 315-326.

Salehyan, Idean, and Kristian Skrede Gleditsch (2006) "Refugee flows and the spread of Civil War," *International Organization*, 60(2): 335-366.

Schneckener, Ulrich (Ed.) (2004) *States at Risk: Fragile Staatlichkeit als Sicherheits- und Entwicklungsproblem*, Berlin: Stiftung Wissenschaft und Politik.

Stern, Nicolas (2006) *The Economics of Climate Change: The Stern Review*, available via http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm (October 30, 2009).

Suhrke, Astri (1997) "Environmental degradation, migration, and the potential for violent conflict," in N.P. Gleditsch (Ed.), *Conflict and the Environment*, The Hague: Kluwer.

Tänzler, Dennis, Alexander Carius and Achim Maas (2008) "Assessing the susceptibility of societies to droughts: A political science perspective," *Regional Environmental Change*, 8(4): 161-172.

UNEP (2007) *Sudan: Post-Conflict Environmental Assessment*, Nairobi: UNEP.

UNHCR (2006) *Statistical Yearbook 2005: Ethiopia*, available at <http://www.unhcr.org>.

UNPD (2006) *World Population Prospects: The 2006 Revision Population Database*, available at <http://esa.un.org/unpp/> (November 23, 2009).

Weidmann, Nils B., Patrick Kuhn and Varja Nikolic (2007) "Refugees as local catalysts of conflict? A statistical assessment," paper presented at the 48th ISA Convention, Chicago.

Whitaker, Beth Elise (2003) "Refugees and the spread of conflict: Contrasting cases in Central Africa," *Journal of African and Asian Studies*, 38: 211-231.

Andrea Warnecke is a Senior Researcher at the Bonn International Center for Conversion, Germany; Dennis Tänzler is a Senior Project Manager at Adelphi Research, Berlin; Ruth Vollmer is a Research Assistant at the Bonn International Center for Conversion, Germany.

The Bonn International Center for Conversion (BICC) is an independent, non-profit organization dedicated to promoting and facilitating peace and development through research, advisory services, and training.

Adelphi is a leading think tank for policy analysis and strategy consulting, offering creative solutions and services on global environment and development challenges for policy, business and civil society communities.

PHOTO CREDIT: Floods in Ifo refugee camp, Dadaab, Kenya, UNHCR: B. Bannon, December 2006.

Study team members

Susan Martin, Institute for the Study of International Migration, School of Foreign Service, Georgetown University, Washington, DC (Co-Chair)

Koko Warner, Institute for Environment and Human Security, United Nations University, Bonn, Germany (Co-Chair)

Jared Banks and Suzanne Sheldon, Bureau for Population, Refugees and Migration, U.S. Department of State, Washington, DC

Regina Bauerochse Barbosa, Economy and Employment Department, Sector Project Migration and Development, German Technical Cooperation (GTZ), Eschborn, Germany

Alexander Carius, Moira Feil, and Dennis Tänzler, Adelphi Research, Berlin, Germany

Joel Charny, Refugees International, Washington, DC

Dimitria Clayton, Ministry for Intergenerational Affairs, Family, Women and Integration, State of North Rhine-Westphalia, Düsseldorf, Germany

Sarah Collinson, Overseas Development Institute, London, United Kingdom

Peter Croll, Ruth Vollmer, Andrea Warnecke, Bonn International Center for Conversion, Bonn, Germany

Frank Laczko, International Organization for Migration, Geneva, Switzerland

Agustin Escobar Latapi, Centro de Investigaciones y Estudios Superiores en Antropología Social (CIESAS), Guadalajara, Mexico

Michelle Leighton, Center for Law and Global Justice, University of San Francisco, San Francisco, California and Munich Re Foundation-UNU Chair in Social Vulnerability

Philip Martin, University of California, Migration Dialogue, Davis, California

Heather McGray, World Resources Institute, Washington, DC

Lorenz Petersen, Climate Change Taskforce, German Technical Cooperation (GTZ), Eschborn, Germany

Aly Tandian, Groupe d'Etudes et de Recherches sur les Migrations (GERMS), Gaston Berger University, Senegal

Agnieszka Weinar, Directorate-General Justice, Freedom and Security, European Commission, Brussels, Belgium

Astrid Ziebarth, German Marshall Fund of the United States, Berlin, Germany.

List of papers

Developing Adequate Humanitarian Responses
by Sarah Collinson

Migration, the Environment and Climate Change: Assessing the Evidence
by Frank Laczko

Climate Change and Migration: Key Issues for Legal Protection of Migrants and Displaced Persons
by Michelle Leighton

Climate Change, Agricultural Development, and Migration
by Philip Martin

Climate Change and International Migration
by Susan F. Martin

Climate Change, Migration and Adaptation
by Susan F. Martin

Climate Change, Migration and Conflict: Receiving Communities under Pressure?
by Andrea Warnecke, Dennis Tänzler and Ruth Vollmer

Assessing Institutional and Governance Needs Related to Environmental Change and Human Migration
by Koko Warner

Transatlantic Study Teams

The GMF Immigration and Integration Program's Transatlantic Study Teams link the transatlantic debate on international migration flows with its consequences for sending and receiving regions. Through compiling existing data, policy analysis, and dialogue with policymakers, selected study teams gather facts, convene leading opinion leaders on both sides of the Atlantic, promote open dialogue, and help to advance the policy debate. Study teams are chosen by a competitive selection process, based on the overall quality of their proposal, its policy relevance, institutional strength, sustainability, and potential for synergies. The Transatlantic Study Team 2009/2010 is investigating the impact of climate change on migration patterns. Environmental deterioration, including natural disasters, rising sea level, and drought problems in agricultural production, could cause millions of people to leave their homes in the coming decades. Led by Dr. Susan F. Martin, Georgetown University, and Dr. Koko Warner, UN University, the team consists of scholars, policymakers and practitioners from the migration and environmental communities.

The German Marshall Fund of the United States (GMF) is a non-partisan American public policy and grantmaking institution dedicated to promoting better understanding and cooperation between North America and Europe on transatlantic and global issues. GMF does this by supporting individuals and institutions working in the transatlantic sphere, by convening leaders and members of the policy and business communities, by contributing research and analysis on transatlantic topics, and by providing exchange opportunities to foster renewed commitment to the transatlantic relationship. In addition, GMF supports a number of initiatives to strengthen democracies. Founded in 1972 through a gift from Germany as a permanent memorial to Marshall Plan assistance, GMF maintains a strong presence on both sides of the Atlantic. In addition to its headquarters in Washington, DC, GMF has seven offices in Europe: Berlin, Bratislava, Paris, Brussels, Belgrade, Ankara, and Bucharest.

The Institute for the Study of International Migration is based in the School of Foreign Service at Georgetown University. Staffed by leading experts on immigration and refugee policy, the Institute draws upon the resources of Georgetown University faculty working on international migration and related issues on the main campus and in the law center. It conducts research and convenes workshops and conferences on immigration and refugee law and policies. In addition, the Institute seeks to stimulate more objective and well-documented migration research by convening research symposia and publishing an academic journal that provides an opportunity for the sharing of research in progress as well as finished projects.

The UN University established by the UN General Assembly in 1973, is an international community of scholars engaged in research, advanced training and the dissemination of knowledge related to pressing global problems. Activities focus mainly on peace and conflict resolution, sustainable development and the use of science and technology to advance human welfare. The University's Institute for Environment and Human Security addresses risks and vulnerabilities that are the consequence of complex environmental hazards, including climate change, which may affect sustainable development. It aims to improve the in-depth understanding of the cause effect relationships to find possible ways to reduce risks and vulnerabilities. The Institute is conceived to support policy and decision makers with authoritative research and information.