

Environmentally-induced migrants: a beginning and a way forward

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In response to Susana's useful summary in the Background Paper I would like to emphasize the following point: Despite a high level of interest by the policy and academic communities in "environmental refugees", the number of studies convincingly describing environmental effects on human mobility is quite small, and the effects found are not always consistent with expectations. Below, I highlight the difficulties in establishing environmental influences on migration and then review a small number of previous studies which I think have successfully addressed these challenges. Finally, I conclude by presenting two ongoing studies which have the potential to advance the debate on environmentally-induced migration.

A difficult task

Among demographic phenomena, migration has always been among the most difficult to study, due in part to the spatial separation of migrant origins and destinations but also to a lack of consistent definitions and appropriate datasets, particularly in the developing world. Similarly, relatively few environmental datasets are available in origin areas of migration in the developing world at the scales that are most relevant to migration decision-making (i.e., household and community). For the case of natural disasters, before and after data (or data from an unaffected comparison area) are rarely available to permit a thorough analysis. Once appropriate data on migration and the environment have been collected and integrated, relatively complex multivariate analyses are then needed to isolate environmental effects given the many other influences on migration decision-making.

Some successes

Fortunately, as mentioned by Susana, collection of longitudinal and multilevel survey data, supplemented by the use of GIS, has begun to make appropriate data available to conduct multivariate analyses of environmental influences on migration. Studies drawing on this type of approach have addressed both the effects of climate and local environmental change on migration, and have, in my view, produced the most convincing and generalizable evidence of environmentally-induced migration. Regarding the effects of climate, Henry et al. (2004) found rural-rural migration in Burkina Faso to increase with dry climates and rainfall variability in the origin but international migration to decrease. Gutmann et al. (2005), using historical data from the 1930's US Great Plains, showed net migration to increase with fluctuations in precipitation in the origin but to decrease with fluctuations in temperature.

Addressing local environmental changes, Massey et al. (2007) found that both local and longer-distance mobility increased with perceived declines in agricultural productivity in Nepal's

Chitwan Valley, but that only local mobility responded to the time to collect firewood and to the vegetative cover of the community. Rindfuss et al. (2007) showed that individual and household out-migration increased with forest cover in Nang Rong Thailand, though this relationship may be partially explained by correlated and uncontrolled differences in community accessibility. Finally, my own work (Gray, In press) has examined the affects of land quality and harvest fluctuations on rural out-migration in the Ecuadorian Andes, revealing that these factors have stronger effects on local and internal migration than on international migration. Overall these studies do not universally support the prediction that migration will increase with poor environmental quality and environmental degradation, but they do support the consensus (mentioned by Susana) that these effects are likely to be more important for shorter-distance migrations.

Even fewer studies of this type have addressed the effects of large-scale natural disasters, which presumably have large effects on mobility (e.g., Hurricane Katrina in the United States; Groen & Polivka, 2008) but present special challenges for data collection. Nonetheless, Halliday (2006) found no significant effects of earthquake damage on out-migration in El Salvador, and Paul (2005) found no evidence of out-migration after a destructive tornado in Bangladesh, concluding that disaster-linked migration is often overstated. Clearly, displacement is one of the consequences of large-scale natural disasters (as well as environmental infrastructure projects such as the Three Gorges Dam; Heming & Rees, 2000) but special data collection efforts will be necessary to adequately describe the nature and magnitude of disaster-induced migration, particularly in the developing world.

How we might proceed

As examples of potential future directions in the study of environmental influences on migration, I conclude by briefly presenting two ongoing studies in which I am participating. To document the impacts of the 2004 Indian Ocean tsunami in Sumatra, Indonesia, The Study of Tsunami Assistance and Recovery (<http://chd.ucla.edu/STAR/STAR.html>) has used satellite imagery to map tsunami damage and is conducting an ongoing panel survey of 40,000 individuals, including migrant tracking. The representative sample of individuals and limited survey data from prior to the tsunami were derived from the 2004 Indonesian national household sample survey (SUSENAS). Together with PI's Elizabeth Frankenberg and Duncan Thomas, I am currently conducting analyses of the determinants of displacement and return migration using these data. Additionally, Richard Bilborrow and I are directing the project Frontier Migration and the Rural Environment in Ecuador (<http://www.cpc.unc.edu/projects/grants.php?show=140>) which is using satellite images and a retrospective household and community survey in three origin areas of migrants to investigate environmental effects in Ecuador on migration to the Amazon and other destinations.

These two studies demonstrate potential extensions of the use of longitudinal and multilevel surveys along with GIS to document environmental effects on migration, the approach which I have argued has the most promise for advancing research in this field. Hopefully future studies will continue to apply these approaches to better understand the influences of deforestation, soil degradation, climate change and natural disasters on various forms of human mobility, and policy-makers who have largely assumed that these effects occur will take these studies into account.

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