

Developing a framework to analyze the relationship between floods and internal migration

The Costa Rican experience

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A new body of evidence has emerged suggesting that climate is increasing people displacement as an adaptive response to weather related-catastrophes. This research develops a framework to analyze the links between migration and climate change. It also fills in a gap in the existing knowledge about internal migration in Costa Rica and its determinants.

Because of its geological position, Central America is particularly prone to experience extreme environmental weather-related disasters. Furthermore, its socioeconomic characteristics make the region's population highly vulnerable to such events. Every year a considerable number of hydrometric episodes affect the region and there is evidence their intensity and periodicity is increasing lately.

A clear example is the Mitch Hurricane, which constitutes the harshest cross-country event experienced by the region and the second deadliest hurricane to have hit the Atlantic since the Great Hurricane of 1780 (Kugler & Yuksel, 2008). It carried enormous social and economic impacts causing an estimation of 20,000 deaths and 13,000 injuries in Nicaragua, Honduras, Guatemala and El Salvador and leaving 1.5 million people homeless.

These kinds of events and their associated high socioeconomic impacts are expected to increase as a result of climate change, affecting populations through many fronts such as direct impacts on human, physical and psychological integrity and infrastructure (McMichael, 2010; Ki Min et al., 2011). In addition, warming and drought may affect agricultural production, access to clean water and would set vast new areas for tropical diseases (such as malaria and dengue) to be transmitted (McMichael, 2010); rising sea levels could result in uninhabitable coastal areas and several disappeared island states (Gosling, 2011). Finally, competition over a descending pool of natural resources could cause disputes and migrations (IOM, 2009).

This paper addresses the hypothesis that extreme weather events partially explain permanent internal migration as an adaptive measure. An analytical model is built and validated for the case of Costa Rica. In a more precise manner, this paper explores the relationship between hidrometeorological events and internal migration flows. It also offers a quantitative empirical assessment of the determinants of nationwide inter-cantonal migration flows, with emphasis in climate related variables.

Key Points

- Migration is found to increase in response to extreme weather events in the origin canton.
- Households respond both to ongoing/recent natural disasters and to past events with lags.
- Migration is induced by both population's characteristics and location-specific attributes.

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Results show that migration flows behave as expected: they tend to increase as response to extreme weather events in the home-based canton, both when considering migration in the short run (five year span) and the long run (migration during a lifetime). Natural disasters at destination were not included in these regressions as households may choose a location at a disaster prone canton without being at risk, since canton's vulnerability is more likely to be expressed in specific areas within a county and not countywide. Although no comparisons can be established between disasters before and after 1995 since data has been gathered from different sources, results show that households respond both to recent or ongoing natural disasters and also to past events with time lags.



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Conclusions

Results presented are preliminary as there are still two important features to incorporate into the final version of the paper. The first requires adding more climatological data as explanatory variables to test for the existence of a relationship between migration and average rain levels and temperature. This would allow drawing conclusions additional to the already observed impact of extreme events on human displacement flows.

Although there are still some methodological approaches to test in order to provide more robust conclusions, results are strong enough to be categorical in that evidence support the thesis that people are being displaced from their areas of origin by inhospitable climate conditions. Implications of this result are of enormous interest for policy makers interested in poverty reduction and global development as migration movements are highly related to such issues.

The relevance of this paper in light of the many pending questions resides in that it establishes a starting point in the analysis of climate induced migration in Latin America. From here, many other research questions can be addressed.

ABOUT THIS BRIEF

This brief is based on the paper "Developing a framework to analyze the relationship between floods and internal migration: the Costa Rican experience", to be published in 2012.

FURTHER READING

IOM. (2009). Migration, Environment and Climate Change: Assessing the Evidence. Geneva: International Organization for Migration.

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