

The numbers game

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Estimates of the potential number of 'climate change migrants' vary hugely. In order to persuade policymakers of the need to act and to provide a sound basis for appropriate responses, there is an urgent need for better analysis, better data and better predictions.

As early as 1990 the Intergovernmental Panel on Climate Change (IPCC)¹ was arguing that the greatest single impact of climate change could be on human migration. So far, the scientific community has focused on establishing the extent and nature of anthropogenic climate change and its impact on our weather systems and coastlines. Much less time and energy, however, have been spent on empirical analysis of the impacts of climate change on human population distribution.

Consequently, the figures that analysts have produced to date represent little more than well-educated guesswork. This is unsurprising; the science of climate change is complex enough, even before considering its impact on societies with widely differing resources and varied capacities to adapt to external shocks.

To assess the future impact of climate change on complex changing communities is to heap prediction upon prediction, multiplying the potential margin of error.

Perhaps the best-known estimate for future migration forced by climate was made by Professor Norman Myers of Oxford University. Looking ahead to 2050 he has argued that "when global warming takes hold there could be as many as 200 million people [displaced] by disruptions of monsoon systems and other

rainfall regimes, by droughts of unprecedented severity and duration, and by sea-level rise and coastal flooding."² This is a daunting figure, a ten-fold increase on today's entire population of documented refugees and IDPs. It would mean that by 2050 one in every 45 people in the world would have been displaced by climate

Programme (UNEP) argues that by 2060 there could be 50 million 'environmental refugees' in Africa alone. Most apocalyptically, in 2007 Christian Aid suggested that nearly a billion people could be permanently displaced by 2050: 250 million by climate change-related phenomena such as droughts, floods and hurricanes, and 645 million by dams and other development projects.

However, Professor Myers' estimate of 200 million climate migrants by 2050 has become the generally accepted figure and is



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Flooding of slum housing in the Ebute Metta district of Lagos, Nigeria, September 2007.

change (from a predicted global population of nine billion people).

Other estimates vary widely in terms of numbers, time frame and causes. In 2005 the UN University's Institute for Environment and Human Security warned that the international community should prepare for 50 million 'environmental refugees' by 2010. The UN Environment

widely cited. But repetition does not make the figure inherently accurate. Professor Myers himself admits that his estimate, although calculated from the best available (and limited) data, required some "heroic extrapolations". The simple fact is that nobody really knows with any degree of precision what climate change will mean for human population distribution.

We know that climate change will redraw our coastlines, alter where we can grow food, move where and when we can find water, and expose us to fiercer storms or more severe droughts. We know that on current predictions the 'carrying capacity' of large parts of the world – the ability of different ecosystems to provide food, water and shelter for human populations – will be compromised by climate change. Intuitively we know that climate migration is likely to be a serious issue in future. We just don't know how serious. And it is hard to persuade policymakers of its importance without concrete (or at least more sophisticated) figures.

The estimates we have so far are no real foundation for an appropriate response either. The challenge now is to better understand how climate change could affect population distribution and then to develop effective ways to address the possible consequences of forced migration, such as social and economic dislocation, delayed development or conflict. For that we need clearer answers to some key questions: How many people are likely to move as a result of climate change? Where are they likely to come from and go to? How much warning will they have? Will they be able to return?

Better data on any or all of the questions above will help identify the most vulnerable populations, the regions of greatest concern and the potential effects of climate migration on development and stability. Ultimately, better data would move the debate towards the three questions of most relevance to policymakers: Who should be responsible for providing for climate-induced migrants? For how long will they typically need support? And how much will it all cost?

The problem of prediction

Developing more solid predictions will require a lot of hard number-crunching that is only now really starting. Those predictions are complicated by at least four factors:

Disaggregating causality:

Migrants' decisions to leave their homes are influenced by a number of complex factors; deciding causality between economic 'pull' and environmental 'push' is often

highly subjective. Disaggregating the role of climate change from other environmental, economic and social factors requires an ambitious analytical step into the dark. In short, deducing cause and effect between climate change and forced migration is very difficult.

Eliminating the statistical 'white noise':

Future climate migration will take place against a background of unprecedented changes in the number and distribution of the world's population. The global population is currently growing at an annual rate of 1.1% and is predicted to peak at 9.075 billion by 2050 (from its 2005 level of 6.54 billion). Meanwhile, there is an accelerating move to urban areas. Already more than half of the world's population lives in urban settings and the growth rate of the urban population is nearly double that of total population growth. Clearly it would be absurd to attribute the entire urban drift to climate change but disaggregating the additional role of climate change on existing rural-urban migration is very hard.

Dealing with the lack of data:

Base-line data for current migration flows in many of the developing countries thought to be most vulnerable to climate change are patchy and incomplete. Nor is there much capacity in developing countries or the international community to gather this kind of data, particularly for internal displacement. Census data rarely include the kind of questions that would give a nuanced understanding of the reasons behind internal population movements. What limited capacity exists is focused on tracking cross-border migration – which only captures a part of the picture, given that the majority of forced climate migrants are likely to stay within their own borders.

Factoring in uncertainty:

Finally, although climate modelling techniques have progressed dramatically over the past decade, we have not yet developed the modelling techniques that even begin to adequately account for the impact of individual choice, the potential for international action and the variability of future emissions and meteorological scenarios.

Towards better data

We need more time, effort and energy to be put towards developing a better understanding of future forced migration. This will require an attempt to develop objective and empirically-based detailed numerical scenarios. To do so we will need to generate more advanced computer models, find better base-line data and build the capacity of institutions and governments to track movements of forced migrants both within and across national boundaries.

Some of this is already underway. UNHCR, for example, attempts to track refugees worldwide, UNFPA (the UN Population Fund) monitors patterns in the growth and location of the world's population, and analysts are investing an unprecedented amount of computer power in modelling the world's climate. We do not need to start from scratch; we can begin by applying existing knowledge and expertise to the specific problem of forced climate migration.

We need to undertake more detailed and nuanced case studies of how, why and where people migrate. We need to understand what that means for the welfare and prospects of the areas they leave, the places they go to and the migrants themselves. We will need to decide how long people should be counted as forced migrants (one year, five years, one generation?) and what their needs are at different stages of the resettlement process. Making sense of it all will require a multi-disciplinary approach that combines perspectives from, at least, sociology, economics, geography, computer modelling and climate science.

What impact climate-induced migration ultimately has on development, security and human well-being depends, of course, on whether 20 or 200 million people are displaced. And if we know what to expect, we can be better prepared.

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1. www.ipcc.ch

2. Myers, Norman, 'Environmental Refugees: An emergent security issue', 13th Economic Forum, May 2005, Prague. www.osce.org/documents/eea/2005/05/14488_en.pdf