make our careers so much more cheerful and colorful that the effort will surely be worth it. I dare you to try!

Happy 20th Anniversary, *EDE*!

A young Olive Ridley turtle making its way to the ocean
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Question 7: What do you consider to be some important research questions in environment and development economics that haven't received adequate attention?

The climate change, migration and conflict nexus

CEES WITHAGEN
Department of Spatial Economics, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands. Tel: +31-20-5986164. Fax: +31-20-5986004. Email: cwithagen@feweb.vu.nl
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Early this year, Thomas Friedman (2014) reported on a (Wikileaks) cable sent in 2008 from the US Embassy in Damascus concerning the drought

Syria had been suffering from since 2006 (and which was going to last for another couple of years). The Syrian UN food and agriculture representative was seeking assistance for among others 15,000 small-holding farmers, who might otherwise seek jobs in Syrian cities (leaving many women and children behind in poverty) and who could arguably add to already existing social and economic tensions in those cities.

In spite of its anecdotal character and the lack of strong evidence for causality, this story may serve to demonstrate the need to pay more attention to the possible link between climate change, migration and (violent) conflict. Most integrated assessment models (IAMs) we know deal mainly with science and economics. In my view it is important to add demographic elements into the analysis. Of course I am not the first economist, let alone the only one (see, for example, Stern, 2013 and the references therein), who argues that migration should play a much more prominent role in the IAMs as we know them. But it is striking to me that the climate change–migration nexus has not received much more attention in the field of economics.

Droughts present only one example that may lead to climate-induced migration. There are many other effects from climate change that may cause migration. Stern (2013: 841) lists the following effects of climate change: water shortage as a result of desertification, droughts, flooding; 'changing patterns of precipitation', leading to flooding; 'collapse of forests and biodiversity'; 'extreme weather events'; 'storm surges from seas/oceans'; and 'global sea levels'. Many of these can evoke mass migration. It is difficult to assess the accuracy of the figures that can be found in the literature. Marchiori and Schumacher (2011) provide examples of present-day migration involving millions. And they estimate that 'more than 135 million people could be at risk of needing to migrate due to desertification alone … and roughly 200 million due to sea level rise' (Marchiori and Schumacher, 2011: 575). Also Oppenheimer (2013: 441) talks about substantial flows, 'running into the hundreds of millions during the next decades'. Gemenne (2011) talks about 150–200 million people displaced by 2050. Finally, Reuveny (2007) gives a detailed account of 38 climate-related displacements, including the large numbers of people involved.

There might be a direct link between climate change and violent conflict. Brückner and Ciccone (2011) claim that in sub-Saharan African countries temporary negative shocks in rainfall within a country may lead to more democracy, because it becomes relatively less costly to fight autocratic regimes. Bai and Kung (2009) show that little rainfall may have induced nomadic tribes to invade Han Chinese regions, because looting was an essential means of survival. In this essay, however, the focus is on the relationship between climate change and migration, and the conflict possibly arising from migration.

In economics there exists a bit of theory on migration and transboundary pollution. Hoel and Shapiro (2003) show that with full mobility of population across countries and transboundary pollution, jurisdictions aiming at maximal utility of their inhabitants will in a Nash equilibrium choose instruments that lead to the first best. Haavio (2005), however, has a less optimistic point of view. He claims that the Hoel/Shapiro result crucially hinges upon costless migration. Moreover, if pollution or climate

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change manifests itself through accumulated emissions, then inefficiency results even if pollution is only local. Another body of literature addresses the impact of migration on specialization patterns and the possibility of agglomerations (Elbers and Withagen, 2004; Lange and Quaas, 2007; Eppink and Withagen, 2009; Rauscher and Barbier, 2010). The analytical vehicle used here is an extension of the well-known New Economic Geography methodology, in a context where migration is due to differences in real wages as well as the state of biodiversity. Eppink and Withagen find that a symmetric pattern of specialization is more likely now than without the biodiversity dimension. In an early contribution, Sandmo and Wildasin (1999) discuss the differential tax treatment of immigrants. However interesting, these studies do not address the 'big' questions regarding mass migration and (violent) conflict.

In any study dealing with migration it is important to make a distinction between several types of migration, because they may call for different ways of approach and solution. Migration can be temporary (e.g., when people can return to their homes after a natural disaster) or permanent, when it is the result of, for example, drastic sea level rise. It may be forced or (more or less) voluntary. And migration can be at the national level or transboundary. In particular, in the latter case conflicts may arise when the receiving country suffers from immigration (see, for example, Licker and Oppenheimer, 2013).

After analyzing the causes of migration, the next step is to make the link with conflict. Two aspects require attention here. First, conflict may arise because of the lack of a legal framework to address the needs of the 'climate refugees'. These refugees do not have a status under the 1951 UN Convention relating to the Status of Refugees. In the literature we see pleas for new legal instruments, a standalone Convention or a protocol under the UN Framework Convention on Climate Change (see Cournil and Mazzega, 2006; Environmental Justice Foundation, 2009; Biermann and Boas, 2010). Second, to make the step from migration to (violent) conflict and to test for causality a theory is needed. Reuveny (2005, 2007) distinguishes four factors that may play a prominent role (in addition to purely local conditions): competition over resources, ethnic tensions, distrust and crossing fault lines (e.g., migration from rural to urban areas). In 19 of the 38 major migration cases Reuveny considers, conflict has arisen and it seems that these factors have had significant impact. However, clearly much more empirical (econometric) work lies ahead. The climate change–migration–conflict link should be added to existing IAMs. Economists need to be more aware of the relevance of this link and to further investigate it. This will pose major challenges. But climate change problems cannot adequately be tackled without paying attention to demography and conflict.

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