

Data on environmental migration: How much do we know?¹

Estimates and guesstimates

Migration is making headlines in Europe, and climate change is increasingly acknowledged as a potentially contributing factor to the decision to migrate. Consequently, calls for data on environmental migrants² have become prominent. Estimates of 200 million to 1 billion people moving due to environmental factors continue to be cited, including in the media. However, those figures are known for likely overestimating the phenomenon and represent guesstimates rather than

actual evidence (IPCC, 2007; Foresight, 2011; Gemenne, 2011; Laczko and Piguet, 2014).

As migration is multicausal, it is difficult to distinguish the environment as its sole driver except for some movements linked to natural disasters. Yet even in the case of hazards, socioeconomic, political, demographic, cultural and personal factors play a driving or impeding role for (im-)mobility (Laczko and Aghazarm, 2009; Foresight, 2011). Thus, global figures on environmental migrants are difficult to produce, except for disasters. Yet innovative approaches exist to study environmental migration, which can provide insights for informing policies.

Useful and reliable existing estimates are collected by the Internal Displacement Monitoring Centre (IDMC) in its annual report on *Global Estimates: People displaced by disasters*. A striking 26.4 million people have been newly displaced annually between 2008 and 2014, meaning one person per second (IDMC, 2015). The effects of climate change are likely going to lead to an increase of this figure. Some also have to flee their homes several times or continue to reside in makeshift shelters, sometimes for as long as 26 years. The effects of hazards on displacement are global in nature, affecting all world regions, particularly Asia. Internally displaced persons (IDPs) who are displaced by disasters in Asia represented 87 per cent of all displaced in 2014, while the continent only hosts 60 per cent of the world's population (IDMC, 2015), thus underlining a particular regional vulnerability and exposure.

If one puts these figures into perspective with people newly displaced by conflict, IDPs displaced by disasters were almost double of those who had to flee their homes due to armed conflict (IDMC, 2015).³

1 Disclaimer: The opinions expressed in this briefing are those of the author and do not necessarily reflect the views of the International Organization for Migration (IOM). The designations employed and the presentation of material throughout the briefing do not imply the expression of any opinion whatsoever on the part of IOM concerning the legal status of any country, territory, city or area, or of its authorities, or concerning its frontiers and boundaries.

Author: Susanne Melde, Research and Policy Officer, Migration and Environment, Global Migration Data Analysis Centre (GMDAC) of IOM. The briefing largely draws on chapter 3.1 titled "The environment, climate change and disasters: Mainstreaming migration into climate change adaptation, disaster risk reduction and development plans" of the forthcoming *Global Knowledge Partnership on Migration and Development (KNOMAD) Handbook for Improving the Production and Use of Migration Data for Development*. The author would like to acknowledge the comments from Frank Laczko, Dina Ionesco, Alex Flavell, Sieun Lee, Lorenzo Guadagno and Daria Mokhnacheva, Nuno Nunes, Rizki Muhammad, Claudia Pereira and Presler Jean of IOM and Ann Singleton of Bristol University and GMDAC, IOM on an earlier version of the briefing.

2 Defined as "persons or groups of persons who, predominantly for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move within their country or abroad" (IOM, 2011:33). The lack of a universally accepted definition further complicates the debate around data. While this reflects an issue about migration in general, which lacks a universally accepted international definition, it has led to many contested terms, such as "climate refugee" being used in the media and some studies. The reference to refugees is inadequate as this status is linked to concrete grounds of the 1951 Geneva Refugee Convention and the environment figures not among them.

3 Although the figures combine different types of data – flow and stock – the comparison highlights the magnitude of environmental displacement.

Further data sources on environmental migration

Despite reliable global figures on the phenomenon, different sources of data and information on mobility in the context of environmental degradation and hazards exist.⁴ While studies may not count environmental migrants for methodological reasons pointed out above, the evidence base on the complex interlinkages between human mobility and the environment is considerable to inform policy action:

- **Research databases**

The University of Neuchatel developed a database called CLIMIG collecting existing (qualitative and quantitative) studies on the topic: <http://climig.omeka.net/>. The [Environmental Migration Portal](#), led by IOM together with several partners, includes a searchable research database, building on the bibliography of CLIMIG with new additions: <http://environmentalmigration.iom.int/research-database>.

- **Annotated bibliography**

The thematic working group on “Environmental change and migration” of the Global Knowledge Partnership on Migration and Development (KNOMAD) has put together an annotated bibliography on the topic, which is also available in the online compendium on the Environmental Migration Portal mentioned above.

- **Big data** generated by mobile phone users after disasters, such as in Haiti after the 2010 earthquake and several typhoons in the Philippines and Bangladesh, can indicate where displaced persons moved to in order to receive assistance or on internal movements (Laczko and Rango, 2014). This can be a means to collect complementary quantitative data on movements at small-scale and seasonal patterns linked to adaptation to environmental change and disasters that are difficult to account for in traditional household survey tools (Lu et al., 2016).

Data gaps

Most existing studies on environmentally induced migration are either qualitative or focus only on one case study. Comparative surveys across countries are scarce as research tends to be localized and not representative at the national level, using different methodologies and definitions. The European Union-funded [Migration, Environment and Climate Change: Evidence for Policy \(MECLEP\) project](#) aims to address this gap by conducting a comparative analysis of six countries.⁵ The approach can easily be applied elsewhere.⁶ An effort was made to ensure consistency in the use of terms by preparing a [Glossary](#) on relevant migration and environment terms when the [methodology](#) and background studies were developed.⁷ While the evidence base with comparative approaches is slowly expanding, some innovative tools have been used and tested that can address some of the challenges when studying the migration–environment nexus.

Cutting-edge tools

- **Migration and environment country assessments**

Reviewing the existing evidence at country level is a form of best practice, at low cost, to obtain an overview of key environmental events potentially leading to migration and identify data gaps and vulnerable populations. The migration and environment country reports assess existing data, research and policy frameworks. The assessments are discussed and prepared in close cooperation and under the lead of technical working groups comprising policymakers from different ministries, as well as representatives from civil society and academia. Examples exist for [Bangladesh](#), [Papua New Guinea](#), [Haiti](#) and the [Dominican Republic](#). Several other reports are currently being finalized.⁸ The assessments represent the first step for integrating migration into national climate change adaptation plans and the broader national policy framework on

4 For data on persons displaced by disasters, see the first part of the brief.

5 The Dominican Republic, Haiti, Kenya, Mauritius, Papua New Guinea and Viet Nam.

6 Please contact meclep@iom.int for the questionnaire in several languages (English, French, Spanish, Vietnamese and several local languages spoken in the MECLEP pilot countries).

7 Available in English, French and Spanish here: <http://environmentalmigration.iom.int/meclep-highlights>.

8 On Kenya, Mauritius and Viet Nam. See: <http://environmentalmigration.iom.int/meclep-highlights>.

climate change and migration (Melde and Lee, 2014). The review of policy frameworks in the six MECLEP project countries demonstrated government priorities and gaps that need to be addressed by research and policy (see Kelpsaitte and Mach, 2015; Melde, 2015).

• **Using images by unmanned aerial vehicles for sampling**

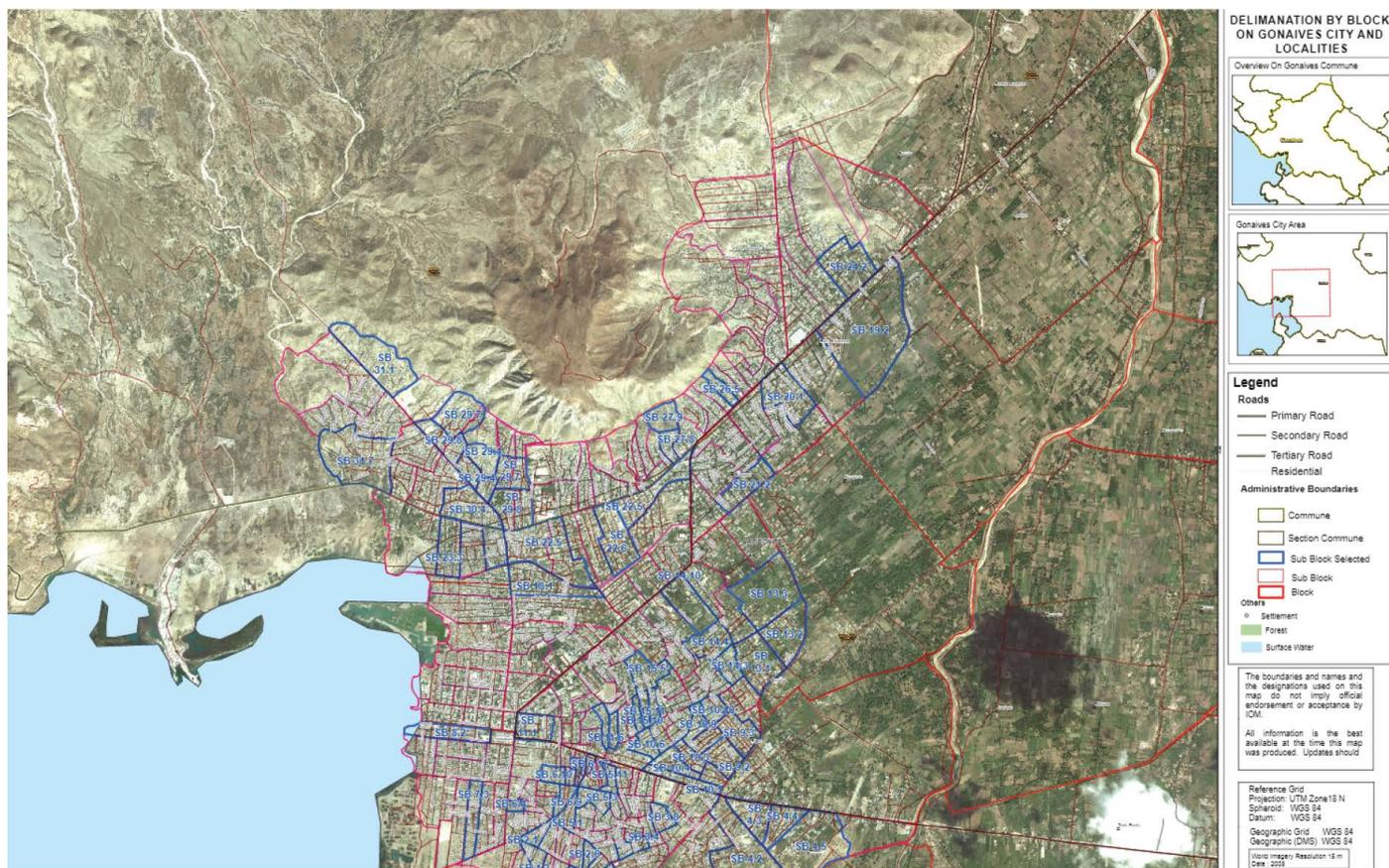
When up-to-date census or other survey data is not available to develop a sampling strategy for household surveys, an innovative approach is using unmanned aerial vehicles (UAVs), such as drones for aerial images. In the case of the MECLEP project in Haiti, IOM used drone images of the city of Gonaïves (see Figure 1) and the municipality of La Marmelade, a very mountainous area, to select sub-blocks for conducting the survey in 2015. An important prerequisite for using this tool is the approval of authorities and local communities.

• **The Displacement Tracking Matrix and the use of UAVs to better target post-disaster humanitarian relief**

The Displacement Tracking Matrix (DTM) is a system to track and monitor displacement. It is designed to regularly and systematically capture, process and disseminate information to provide a better understanding of the movements and evolving needs of displaced populations, whether on site or en route, during and in the aftermath of crises in both natural disaster and conflict settings (see Figure 2). Field teams collect baseline information on internal displacement, but also other movements, such as cross-border displacement, returns and resettlement.⁹

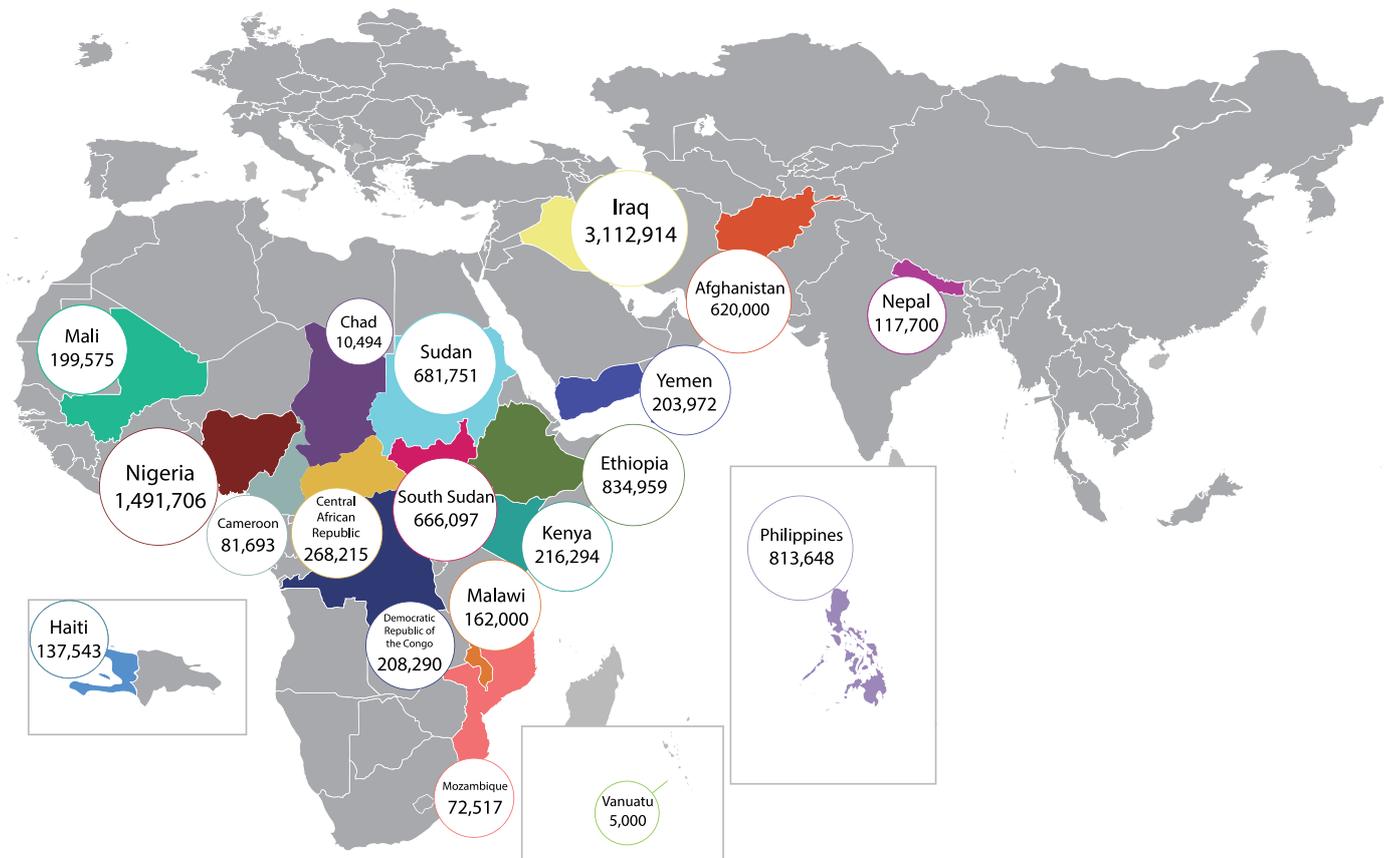
⁹ See: www.globaldtm.info. For a sample country data portal, see: Iraq (<http://iraqdtm.iom.int>).

Figure 1: Demarcation of blocks in Gonaïves city via an aerial image taken by a drone



Source: IOM Haiti, 2015.

Figure 2: IDPs tracked through IOM's DTM, January 2014–July 2015; total 9,904,368



Source: IOM, forthcoming.

Note: Includes both IDPs displaced by conflicts and disasters.

The DTM collects and shares targeted information relevant to all sectors of assistance (such as water and sanitation, food and shelter) and actors involved in the humanitarian response. This approach is particularly pertinent when data collection may or cannot be prioritized, despite its importance. The system refers urgent concerns to the respective sectorial coordination focal points or National Disaster Management Authorities (NDMA) for follow-up. The objective is to ensure the minimum requirements for living conditions of IDPs as defined by international standards.

One DTM tool is using high-definition images, which can map information based on Geographical Information System (GIS) data to reduce risks and vulnerabilities of populations living in hazardous areas. GIS mapping can provide data on the extent of discharge regions and ravines within or close to inhabited areas, the location of stagnant water areas where mosquitoes and disease can proliferate, road conditions, water points, potential obstacles and blockage of water channels, houses that

are located on watersheds or close to rivers, flooded areas and areas that are free of vegetation.

An innovative approach is the use of drone images after natural disasters to compare them with satellite images from before the hazard struck to inform humanitarian relief operations. Figure 3 maps the zones in two localities (Butte Boyer and Santo 20, situated between the communities of Tabarre and Croix-des-Bouquets) in the metropolitan area of the Haitian capital Port-au-Prince a few days after they were hit by Hurricane Sandy in October 2012. The images show which houses are affected by the flooding so humanitarian assistance can be offered to them immediately. The basis for this impact assessment was the then ongoing Census of Affected Areas and Population partnership of IOM with the Haitian Statistical Institute (2010–2013). Furthermore, UAVs can provide imagery to fill the gap when no recent or new images are available, such as on informal settlements or IDP camps that were established recently.

• **Drought-induced displacement modelling**

The IDMC (Ginnetti and Franck, 2014) modelled displacement due to droughts for the Horn of Africa. The two-pronged model tested in Northern Kenya supports reviewing existing data and simulating the different results and impacts of environmental degradation and climate change, demographic trends and policy options (on development, adaptation and humanitarian affairs) on target populations over the next 5 to 50 years. Accessing reliable data remains a challenge for allowing more robust forecasts.

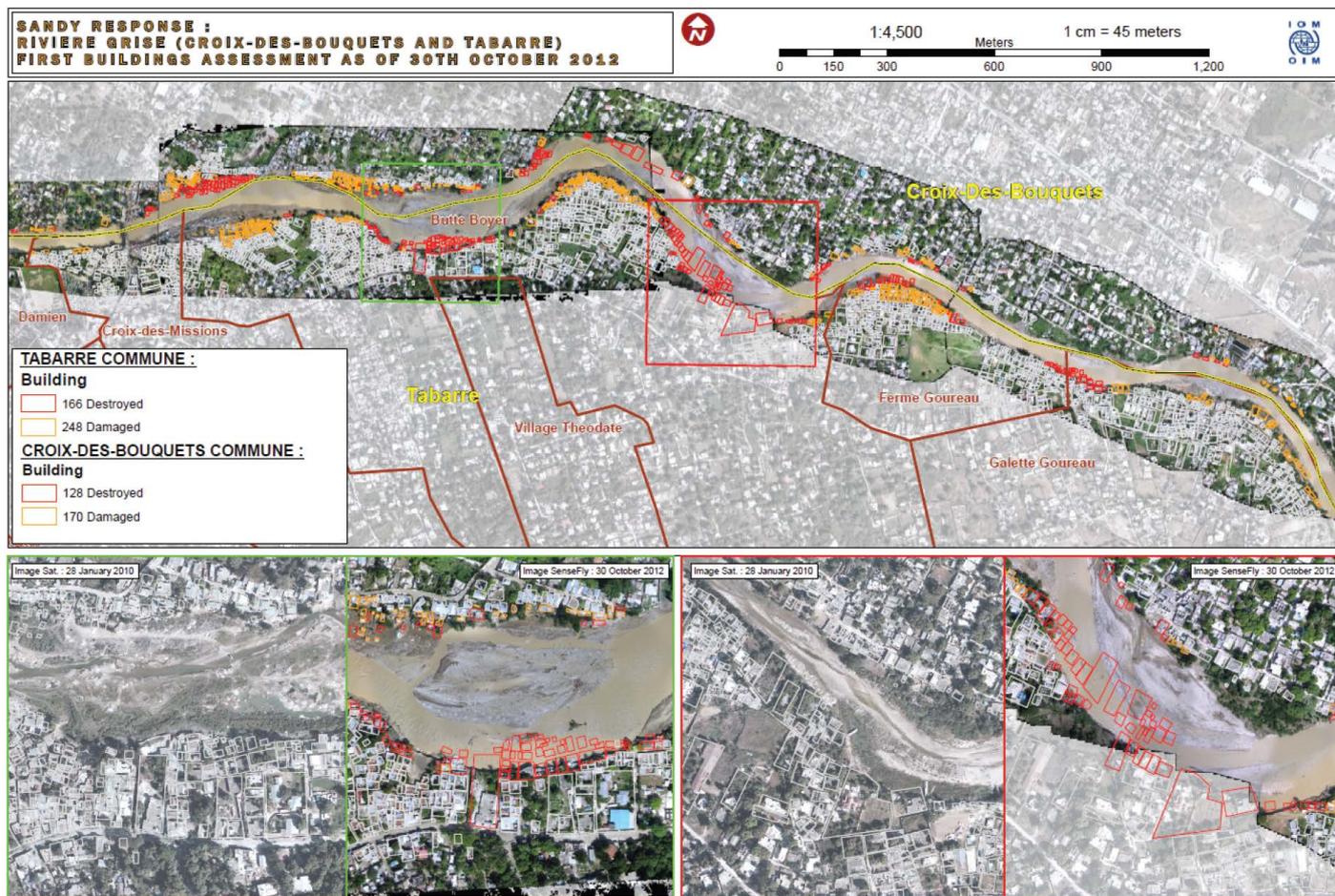
Making use of existing data and addressing gaps in the future

Human (im-)mobility due to environmental degradation and climate change is already a reality in many countries today and expected to increase (IPCC, 2014). While concrete figures may not be available for all cases,

a considerable literature exists on the interlinkages between migration, displacement and the environment. States are only starting to integrate the positive potential of migration as an adaptation strategy, while several have already recognized the protection challenges posed by displacement and planned relocation in the context of disasters and environmental change (Martin, 2014; Kelsaite and Mach, 2015; Melde, 2015). The 2015–2030 Sendai Framework on Disaster Risk Reduction fosters the inclusion of the contribution of migrants in preventing disasters and increasing resilience of vulnerable populations.

This briefing identified good and innovative practices on assessing the evidence to guide new and comparable data collection and support State actors in integrating human mobility in all its facets in adaptation, disaster response and disaster risk reduction planning.

Figure 3: Mapping the impacted zone of Hurricane Sandy in Haiti



Source: IOM Haiti, 2012.

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About

GMDAC

In response to growing calls for better data on migration, and better use and presentation of migration data, IOM has created a Global Migration Data Analysis Centre (GMDAC). Located in the heart of Berlin, Germany, the Centre aims to provide authoritative and timely analysis of data on global migration issues as a global hub for data and statistics on migration.

Data Briefing Series

The GMDAC Data Briefing Series aims to explain what lies behind the numbers and the data used in migration policy and public debates. The Briefings explain what “the numbers” indicate about movements of migrants, refugees and asylum-seekers, on a range of topics for policy across the globe.

The way the data are presented has an important influence on public perceptions of migration in Europe and the development of policy. The Series will serve to clarify, explain and exchange specialist knowledge in an accessible format for wider public and policy audiences, for capacity-building and evidence for policy. Briefings will be of interest to expert, as well as lay audiences, including journalists, students, local authority and city planners and lawyers.

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