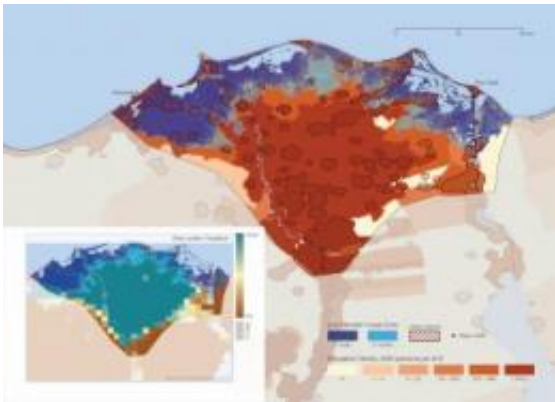


Climate change could drive vast human migrations

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This is the Nile delta, with sea level rises of 1 meter (dark blue) and 2 meters (light blue), along with population density (lighter to darker browns) and urban areas (hatching). Of the 40.2 million people here in 2000, 10.7 million would be inundated by a 2-meter rise. The inset shows the distribution of farmlands. Credit: Center for International Earth Science Information Network, Columbia University

By mid-century, people may be fleeing rising seas, droughts, floods and other effects of changing climate, in migrations that could vastly exceed the scope of anything before, says a major new report. The document, authored by researchers at Columbia University's Center for International Earth Science Information Network (CIESIN), the United Nations University and CARE International, was released at a news conference in Bonn.

The researchers say that the effects of climate are hard to sort from connected factors including political and economic conflicts, extreme weather events, population growth, human destruction of ecosystems and overuse of farmland. However, they say, climate change will eventually play a dominant role by exacerbating all of these problems, and is already having detectable effects. While the report does not attempt to put numbers to those potentially uprooted, estimates from other reports it cites range from 25 million to 50 million by 2010, to almost 700 million by 2050.

"Climate is the envelope in which all of us lead our daily lives. This report sounds warning bells," said coauthor Alexander de Sherbinin, a geographer at CIESIN. "We usually categorize the poor as the ones who will suffer most—but richer societies will potentially lose as well."

The report, *In Search of Shelter: Mapping the Effects of Climate Change on [Human Migration](#) and Displacement*, is based on a first-time global survey of environmental change and migration. It is illustrated with a series of detailed maps, generated by CIESIN, that show how and where significant displacements may occur. Among its findings:

- Breakdown of ecosystem-based economies including subsistence herding, farming and fishing will be the dominant driver of forced migration.
- Climate change will increase the frequency and intensity of natural hazards such as cyclones, floods and droughts. Rains in parts of Mexico and Central America, for instance, are projected to drop as much as 50% by 2080. Farmers in parts of Mexico and north Africa's Sahel region may already be moving in part due to changing rains.

- Sea level rise directly threatens the existence of some 40 countries. Saltwater intrusion, flooding and erosion could destroy agriculture in the densely populated Mekong, Nile and Ganges deltas. A rise of two meters, or six feet--well within some projections for this century-- would inundate nearly half the Mekong's 3 million hectares (7.5 million acres) of farmland. Some Pacific island nations including the Maldives (pop. 300,000) are already considering prospects for total relocation.
- Ongoing melting of alpine glaciers in the Himalayas will devastate the heavily irrigated farmlands of Asia by increasing floods and decreasing long-term water supplies. The glacier-fed basins of the Ganges, Brahmaputra, Irawaddy, Salween, Mekong, Yangtze and Yellow rivers now support over 1.4 billion people.
- Most migrants will probably move within their own countries, or to countries next door. Many will be poor, and many will be unable to move far enough to improve their lots. Ripples from resulting conflicts and collapses will hit richer countries.

Coauthor Charles Ehrhart, CARE's climate-change coordinator, called the potential impacts "startling."

"Societies affected by climate change may find themselves locked into a downward spiral of ecological degradation, towards the bottom of which social safety nets collapse, while tensions and violence rise," said a statement from CARE. "In this all-too plausible scenario, large populations would be forced to migrate as a matter of immediate survival."

De Sherbinin pointed out that human population is projected to grow from 6.8 billion today, to 9 billion by 2050. "Countries are running out

of places to put people productively," he said. "You can't just stockpile people."

The report says it is vital that countries reach an agreement to stem greenhouse gases during this December's United Nations Framework Convention on Climate Change. But even if this deadline is met, most scientists say some amount of [climate change](#) is now inevitable. To mitigate resulting migrations, the report recommends that nations prioritize the most vulnerable populations and invest there in defensive measures, including irrigation technology that uses less water; low-till agriculture; economic diversification; and official systems to manage natural disasters. It says nations must agree on how to resettle populations of low-lying areas, and strengthen the ability of emigrants to send remittances to those left in affected regions.

"New thinking and practical approaches are needed to address the threats that climate-related migration poses to human security and well-being," said coauthor Koko Warner, head of the UN University's Institute for Environment and Human Security.

Source: The Earth Institute at Columbia University ([news](#) : [web](#))

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