

# What drives migration in northern Gujarat?

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*In a new [IGC working paper](#), Ram Fishman, Meha Jain, and Avinash Kishore investigate factors that drive environmental migration and the economic impact of geographical mobility.*

Increasing water scarcity is expected to threaten the livelihoods of hundreds of millions of farmers in semi-arid, developing countries, including India. Adaptation to environmental stress – water scarcity in particular – can take many forms. Within the agricultural domain, farmers may be able to adapt farming practices and technologies to maintain their production even while reducing their water usage. Alternatively, farmers may choose to shift away from agriculture or migrate from areas that face severe water decline. In this study, we find evidence to suggest that the primary modes of adaptation pursued by socially advantaged (dominant castes) farmers in an increasingly water-scarce region of India are migration to cities and employment shifts away from agriculture.



This study took place in the northern districts of the state of Gujarat, where agriculture is critically reliant on groundwater irrigation but where depletion has been a concern for decades (as the world's largest consumer of groundwater, India is the country most vulnerable to groundwater depletion). Water tables in the study area have been rapidly falling over the last four decades, but the rates of decline have been spatially uneven. Our survey results indicate migration and employment shifts tend to be more common in locations that experience more extreme groundwater depletion (deeper water tables). On average, we estimate that an additional 100 feet of water table decline is associated with an increase of about 15 per cent in the odds ratio that a household will have at least one migrant son, as well as at least one son shifting out of agriculture (but remaining in the village). However, we find that these adaptive responses are much more prevalent among the dominant socio-economic groups (landowning castes), and are much less common amongst the landless and marginal land owning castes.

As a result, we do not suggest that water stress and groundwater depletion are the major drivers of migration, especially since migration is taking place against a background of rapid economic and social changes in an economically fast-growing state. A rough estimate from our data is that some 20 per cent of migration may be attributed to the decline in water availability for irrigation. Consistently, respondents attributed about 20 per cent of their sons' migration to water scarcity. Looking beyond north Gujarat, however, this finding suggests migration may

be an important mode of response to depletion in the many other parts of India where water tables are falling, but not yet to the extent that they have in northern Gujarat.

The sort of environmental stress we study here is a gradual process, not a short-term shock. The fact that young farmers are choosing to migrate rather than to adapt agricultural practices may be an indication that such adaptation strategies are not readily available to them. Furthermore, our results suggest that migration opportunities may be largely available only to the dominant land-holding castes that have access to enough social and economic capital to transition away from agriculture. When and if groundwater depletion occurs over a larger geographical scale, migration possibilities may be crowded out, and the implications for agricultural production may be substantially negative. This case study does not allow us to predict the general equilibrium effects of such a process, but it can be a source of concern from the broader policy perspective on food security in India. In particular, we note that the great majority of migrant land-owners were reported to lease out their land, rather than sell it. This raises the concern that increasing amounts of land will be cultivated by individuals with few incentives to invest in that land's productivity or in agricultural infrastructure. The full impacts of migration on agricultural productivity are, however, beyond the scope of this seed study.

The difficulty of assessing the welfare impacts of groundwater depletion and of associated migration prevents us from drawing conclusive policy lessons from our study. Economists consider the permanent movement from the agricultural sector into the non-agricultural sector and from rural to urban areas as an essential aspect of economic development. However, among developing countries, India stands out for its remarkably low levels of occupational and geographic mobility. The World Development Report (2009) argues that policy barriers to internal mobility in India are imposed by omission rather than by commission, and that negative attitudes held by government as well as ignorance of the benefits of population mobility have caused migration to be overlooked as a force in economic development.

Indeed, the government of Gujarat, for example, declares the reduction of rural to urban migration to be a prominent policy goal, and attempts to achieve it through infrastructural investments in rural areas. Our results suggest that government policies to sustain irrigation in the region may have reduced the rates of migration to cities and economic diversification. If it were not for the state government's long standing subsidisation of electricity for groundwater pumping, falling water tables would have most likely constrained agriculture in the area years ago. Similarly, current plans already under implementation to bring surface irrigation canals to this area through energy-intensive lift irrigation programmes may also relieve water scarcity. Our results suggest these policies, in addition to the high energy-related costs they incur, may also slow down processes that are usually considered to be integral to economic growth.

*For more information on this topic, including study data and an analysis of 'push' and 'pull' factors driving migration, see [Patterns of migration, water scarcity and caste in rural northern Gujarat](#), International Growth Centre Working Paper, February 2013.*

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