India

April 2018

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Introduction

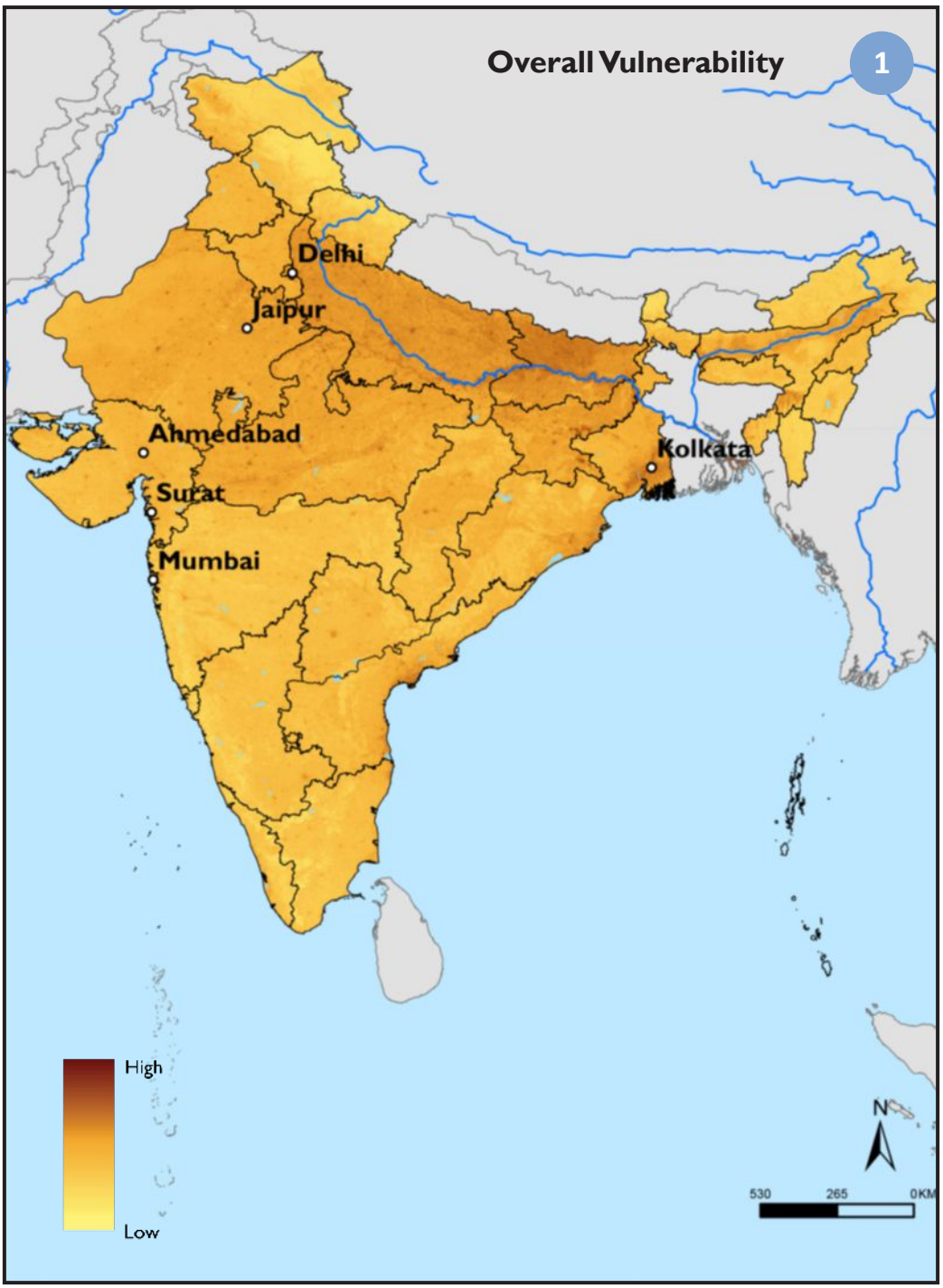
India contains one-sixth of the world's population but only covers 2.4% of the globe's geographic area. Despite rapid development since economic liberalization in 1991, nearly 64% of the population still relies on agriculture and subsistence farming.[1] In 2014, a report by the Indian government's Planning Commission estimated that 363 million Indians, making up 29.5% of the total population, were living below the poverty line in 2011-12, leaving them vulnerable to climate change and food security risks.[2] Water shortages intensified by climate change are affecting the country's agricultural production, especially in the already-arid regions of Rajasthan, Uttar Pradesh, Bihar and the southern states of Andhra Pradesh, Karnataka, and Tamil Nadu. While the states of Odissa, West Bengal, and Andhra Pradesh in the east have low elevation coastal zones with significant cyclone risk, areas close to the Ganges River in eastern India also face significant flooding risks.[3]

As Figures 1 through 5 highlight, India faces moderate climate change vulnerability. Most of the effects of climate change are felt on the coastline around the Bay of Bengal and in Gujarat close to the border of Pakistan (see figure 2). Population pressures (see figure 3), and household capabilities (see figure 4) are also contributors to greater vulnerability in certain regions.[4] Calculations under the CEPSA program indicate that approximately 687 million people (i.e., 56% of the population) in India face above average exposure. Furthermore, roughly 193 million people (16% of the population) face high levels of climate exposure, that is 1 standard deviation above the mean for the entire CEPSA region. While other countries have greater percentages of their populations facing above average exposure, India has the highest absolute number of exposed people in the region because of its large population.[5]

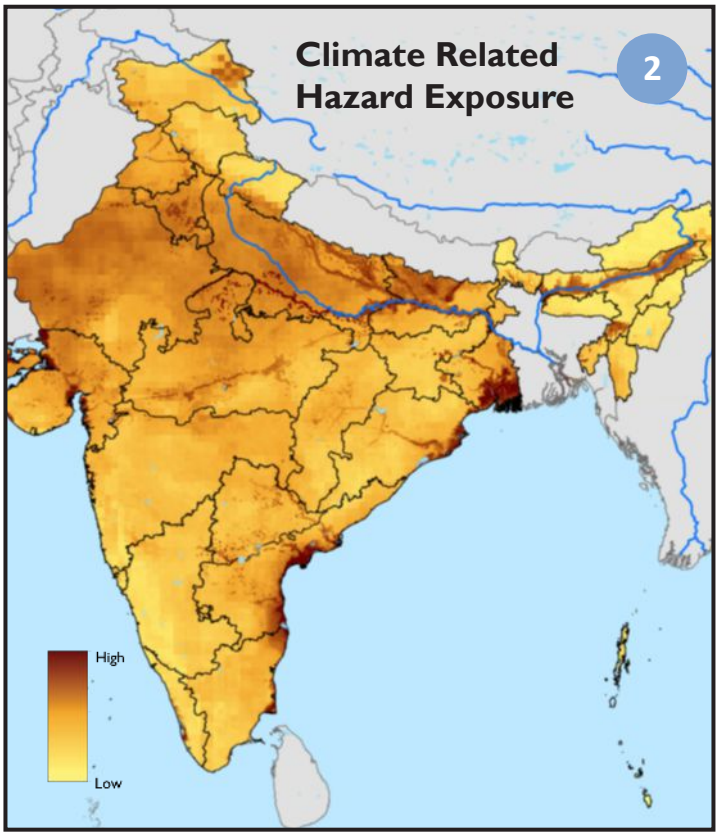
Natural Disasters and Climate Change Vulnerability

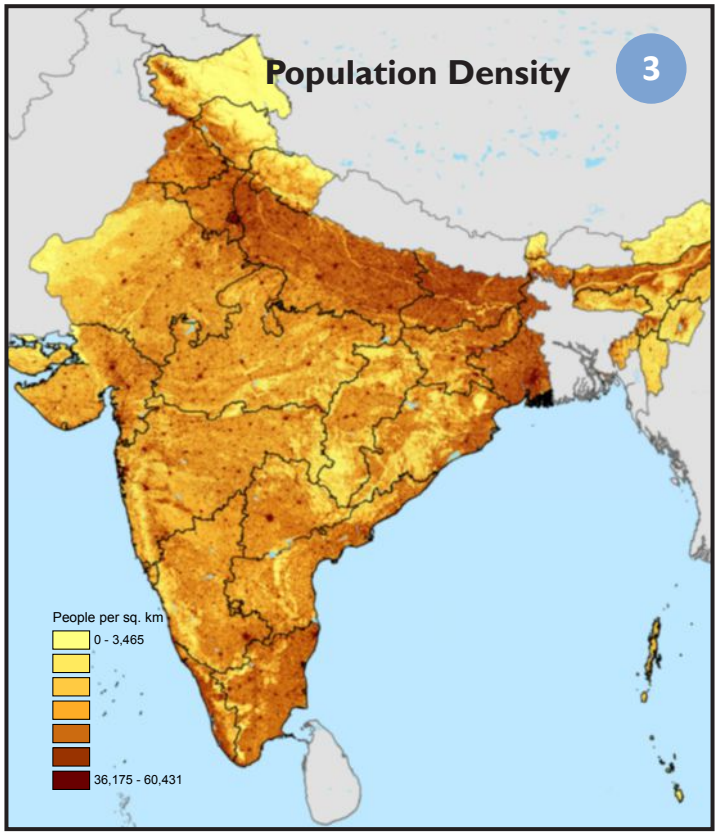
As a large and geographically diverse country, India faces a wide array of climate related risks. Floods affect areas close to the Ganges rivers as well as low elevation coastal areas in southern India that are also at risk of cyclones. In addition, changing monsoon patterns and water scarcity threaten livelihoods and food security in western states, especially threatening since much of the population depends on the yearly monsoon between June and September.[6]

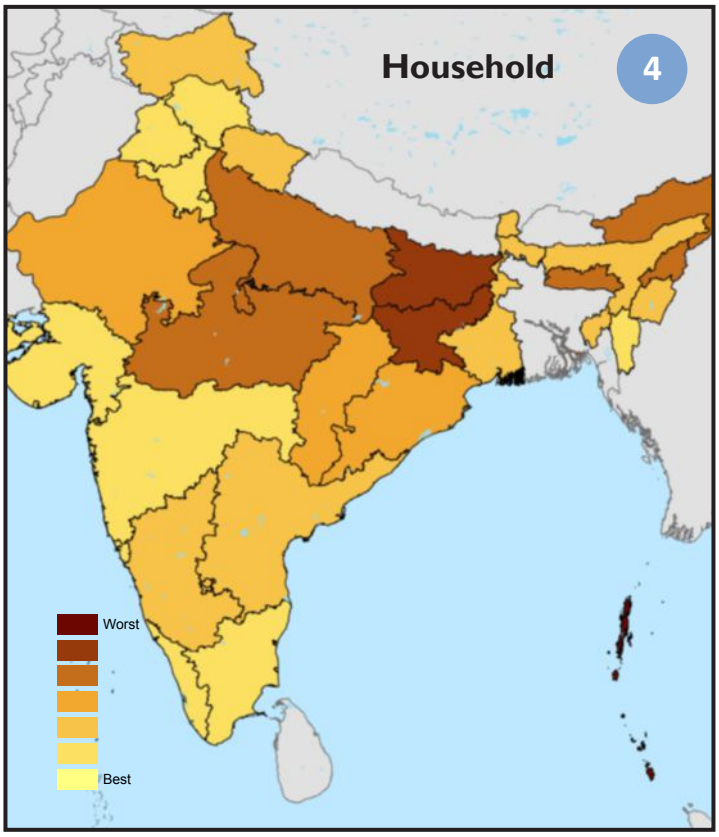
In addition, data from the Indian Meteorological Department's monitoring stations from between 1951 and 2010 found that the annual and seasonal mean temperatures had increased significantly in the western states of Karnataka, Tamil Nadu, Goa, Maharashtra Gujarat and Kerala.[7] Since the early 2000s, yearly extreme

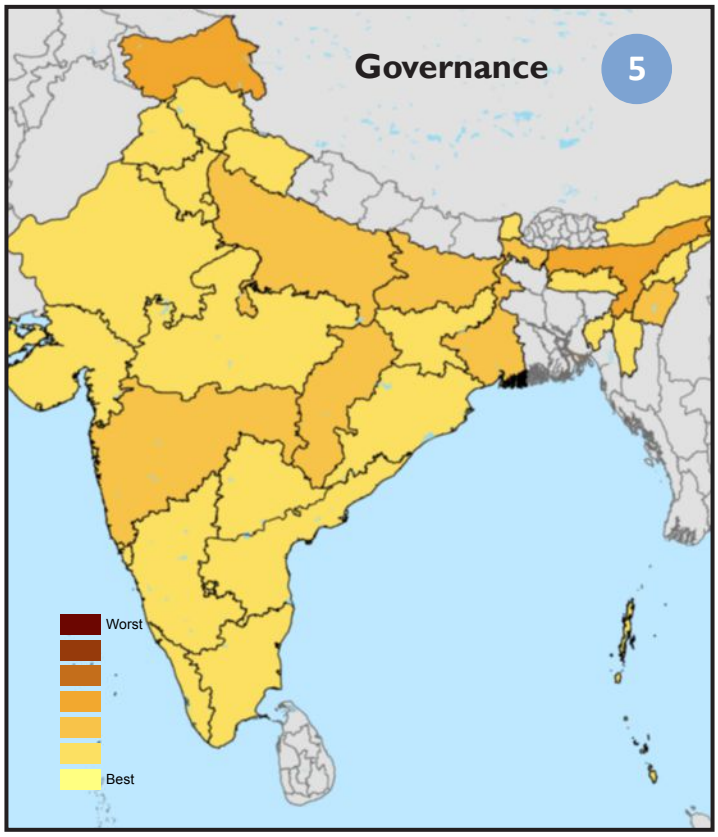


Data Sources: KOF Index of Globalization; World Bank World Governance Indicators; Political Instability Task Force (PITF); Polity IV Project; World Bank World Development Indicators; USAID Demographic and Health Surveys; UNICEF Multiple Indicator Cluster Surveys; Center for International Earth Science Information Network; UNEP\Grid-Europe; Viewfinder Panoramas; LandScan; Princeton University Terrestrial Hydrology Research Group


Climate Related
Hazard Exposure
2
High
Low


Population Density
3
People per sq. km
0 - 3,465
36,175 - 60,431


Household
4
Worst
Best


Governance
5
Worst
Best

temperature events have caused deaths of hundreds and sometimes even thousands. The average frequency of severe heat waves has doubled from 50 days a year across India until 2000, to about 100 in the 2001-2010 decade.[8] The Indian Institute of Public Health (IIPH), which has developed a heat action plan for Ahmedabad and helped cities in Maharashtra develop theirs, has advised that all states affected by heat waves implement similar plans. As of now, Maharashtra, Gujarat, Telangana, and Andhra Pradesh have started a heat action plan.[9]

These heat waves can also be accompanied by devastating droughts. In April 2016, at least 330 million people were affected by droughts as a heat wave extended across much of India with temperatures crossing 120°F for days.[10] A decline in monsoon rainfall since the 1950s has already been observed. Evidence indicates that parts of South Asia have become drier since the 1970s with an increase in the number of droughts. In 2002-2003, droughts affected more than half of India's crop area and led to a huge fall in crop production.[11]

Many parts of India also suffer flooding every year during the annual monsoon rains from June to September. In 2015 when the northeast monsoon was particularly strong over southern India, the state of Tamil Nadu, and especially its capital Chennai, experienced massive flooding. Indiscriminate development and poor urban planning contributed to the floods in India's fourth most populous city, leaving millions without food or clean water and devastating some of India's largest industries.[12]

External Assistance

India received $136 billion in aid between 2000-2013 with $3 billion going towards climate change adaptation and disaster risk reduction. The top five donors -- JICA, DFID, World Bank, ADB and USAID -- provided $118 billion (i.e., 96%) of the total foreign aid to India funding 3,841 projects.[13] While it received billions of dollars in foreign aid, India has also been giving aid to other countries. It had a foreign aid budget of $1.6 billion for the period 2015-16, with much of it going towards its neighbors such as Bhutan, Afghanistan, Nepal, and Sri Lanka. As one of the largest and most powerful states in the region, India largely depends on its own resources and has been able to mobilize to help the affected, with official development assistance only constituting 0.1% of its total GNI.[14,15]

Regional Issues

Rising sea levels and other climate hazards may result in large-scale migration from Bangladesh to India which could produce major conflicts or reignite preexisting ones. During the past three decades, the Indian state of Assam has already experienced intense conflict in reaction to waves of Bangladeshi migration to the state.[16]

Other regional issues are relevant for India. Increasing demand for water has led to tensions over water sharing of the Indus and Ganges Rivers that fall on transnational boundaries. The Indus Water Treaty of 1960 between India and Pakistan has held steady even during major crises and wars between the two states. However, during crisis between India and Pakistan in 1999, 2003, and again in 2016, there were calls in India to end the treaty. Increasing water shortages in both countries due to drought could make water a further source of conflict that divides the two states (see article on Pakistan).[17] India also has disputes over water with China over the Brahmaputra river and Nepal and Bangladesh over the Ganges that could result in more regional tensions.

Governance

Uneven economic development exacerbated by climate change could also increase the insurgency movements in India's Northeast region where states of Nagaland, Mizoram, Manipur, Tripura and Assam have seen bloody conflicts during the past 40 years. Ongoing internal conflicts between Indian states over water sharing and damming will also be exacerbated by climate change. For example a century long conflict over the sharing of the Cauvery River between the states of Karnataka and Tamil Nadu has been the source of protests, riots, and even terrorism.[18]

Since taking office in May 2014, Prime Minister Narendra Modi has taken steps to scale up development efforts to achieve "a prosperous, highly educated, healthy, secure, corruption-free, energy-abundant, environmentally clean and globally influential nation." As a part of this plan, Modi has also committed to clean energy production and has initiated a shift in India's stance in international climate negotiations. However Modi has repeatedly said India would not accept constraints on its development as part of any climate deal.[19] India's challenge will be to improve its state capacity to deal with climate-change induced conflicts while also developing a regional cooperation process for confronting issues that affect the entire South Asia region.

Endnotes

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ACKNOWLEDEMENTS

This material is based upon work supported by, or in part by, the U.S. Army Research Laboratory and the U.S. Army Research Office via the U.S. Department of Defense's Minerva Initiative under grant number W911NF-14-1-0528.