



CLIMATE CHANGE IMPACT CASE STUDY: India's Uttarakhand State

SUMMARY

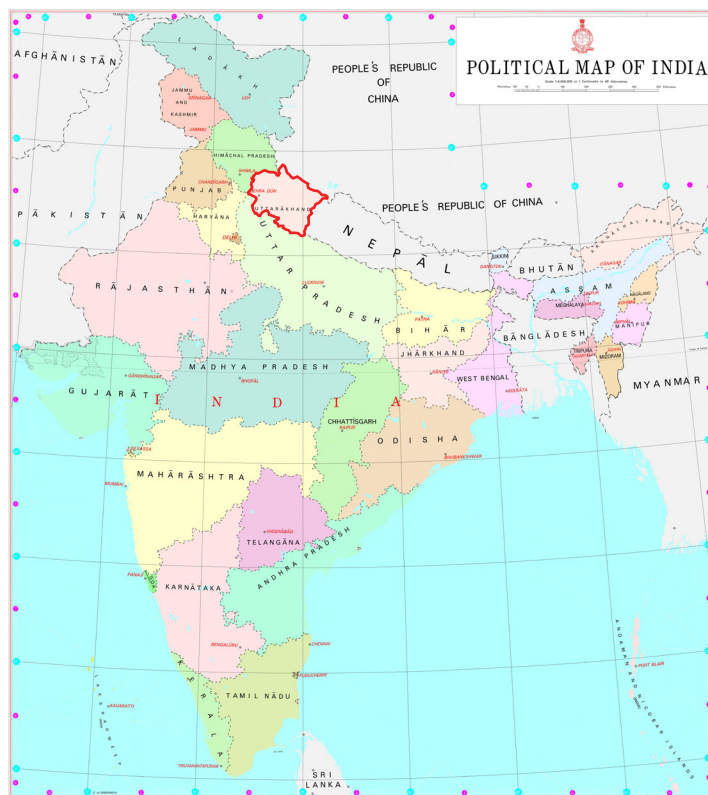
Various climate change impacts, primarily heat and rainfall, are affecting India's northern state of Uttarakhand. The impacts are affecting livelihoods and influencing internal migration.

BACKGROUND

- Climate change is affecting food security, income and resources in Uttarakhand. It also acts as a risk modifier and influences the movement of people in the state.
- The majority of people in Uttarakhand live in rural areas and 71% depend on rainfed agriculture, through terrace farming on hill slopes (Das, 2021)
- Climate Change is affecting agricultural livelihoods and contributing to internal migration in India's northern Uttarakhand state. Many of the migrants are moving from the hills to the plains districts. (Blocher et al., 2021)
- Because of migration, an increasing number of villages in Uttarakhand are uninhabited. According to a 2018 survey, 734 villages in the state have become uninhabited since 2011. These villages are spread across all 13 districts and are often referred to as "ghost villages." (Das, 2021)

CLIMATE CHANGE IMPACTS

- According to the Government of Uttarakhand's "Uttarakhand Action Plan on Climate Change (2014)," some of the reported climate change induced changes in the Uttarakhand Himalayas include: receding glaciers and upwardly moving snowline, erratic rainfall, irregular winter rains, reduction in snow in winter, rise in temperature, increasing intensity and frequency of flash floods, and the drying up of perennial streams. (Government of Uttarakhand, 2014)
- The state may become 1.6 degrees Celsius-1.9 degrees Celsius warmer by 2050; districts at highest elevations warming fastest (Das, 2021)
- Climate change has changed the cropping seasons and cultivation zones for some crops; some fields have become fallow
- Climate Change exacerbating existing pressures on farming including a decrease in land per person, lack of irrigation infrastructure, crop damage by animals; additionally, there is declining interest in farming among young people. (Das, 2021)
- A vulnerability and risk assessment done for the state government's action plan on climate change identified three ways climate change may impact agriculture: increased water stress, increased risk of floods and changes in crop yields (Das, 2021)
- Climate change has also impacted public health in Uttarakhand, with "unprecedented dengue outbreaks." (Upadhyay et al., 2021)



Political Map of the Republic of India as released by the Indian Government (2019, November 2). (Uttarakhand is outlined in red)

Source: Press Information Bureau, Ministry of Home Affairs, Government of India. https://commons.wikimedia.org/wiki/File:2019_Political_Map_of_India.jpg



An aerial view of flood-ravaged Rudraprayag, in Uttarakhand.

Source: Ministry of Defence, Government of India. https://commons.wikimedia.org/wiki/File:An_aerial_view_of_flood-ravaged_Rudraprayag_in_Uttarakhand.jpg

CLIMATE CHANGE PROJECTIONS

- Intensification of climate extremes is projected in India, with increased drought risk, and increases in the quantity of precipitation during heavy rainfall events. (Chapman et al., 2021)
- Projected temperature rises are strongest in the northern regions of India, and annual minimum and maximum temperatures are expected to increase at a greater magnitude than national average temperatures. (Chapman et al., 2021)
- Without adaptation measures, extreme river floods are expected to affect an additional 13 to 34 million people by the 2040s and coastal flooding is expected to affect an additional 5 to 18 million people by the 2070s to end of the century. (Chapman et al., 2021)
- Very large potential increases in heat-related ill health, diarrheal disease, and malnourishment are already beginning to impact communities and are projected to intensify. (Chapman et al., 2021)

KEY POINTS

- Climate change is affecting both population dynamics and displacement in Uttarakhand.
 - Population dynamics: Decreased population growth; depopulation in hill districts
 - Displacement: Climate change shapes displacement patterns differently; e.g., slow-onset climate change impacts will result in differing migration patterns
- Uttarakhand is home to over 10 million people, but is reportedly one of the few states losing population with some migrants leaving the state. Around 70 percent of migration occurs internally, with movement mostly from the hills to the plains and valleys. (Upadhyay et al., 2021)
- According to a report by the Internal Displacement Monitoring Centre (IDMC), the impacts of climate change and co-stressors such as deforestation, unplanned housing, and lack of road connectivity, add to the pressures on households displaced by disasters or forced to migrate in the state. (Blocher et al., 2021)
- The report also says that over the last twenty years, “a decline in agricultural productivity due to low rainfall, erratic rains, and drying mountain springs, has corresponded with out-migration.” Seventy percent of the population is dependent on rain-fed agriculture. (Blocher et al., 2021)
- While some are forced to migrate researchers note that others may be forced to stay back due to lack of resources or obligations. Women who stay at home in Uttarakhand while men migrate are left with the responsibility of managing the farm and household while also dealing with climate change impacts, making an already vulnerable population more vulnerable. (Blocher et al., 2021)
- A study on Uttarakhand by the Germany-based Potsdam Institute for Climate Impact Research and The Energy and Resources Institute in New Delhi (PIK-TERI) has forecast that climate change will increasingly force people to abandon farming at high altitudes and move to the plains over the next 30 years. Climate change impacts influence the decision of people to migrate from the hills to the plains, leaving a growing number of uninhabited villages behind. (Upadhyay et al., 2021)
- According to the Rural Development and Migration Commission, Uttarakhand, the inability to diversify livelihoods in rural areas is the biggest factor pushing outmigration (50%), followed by lack of educational institutions (15%) and healthcare facilities (9%). (Das, 2021)
- The PIK-TERI report identifies three main areas of action for policymakers: “preparing for demographic changes resulting from migration, creating alternative livelihood options in the hill districts (at higher elevations) to revitalize the economy and revisiting the state government’s action plan on climate change as well as the state’s agricultural policies.” (Das, 2021)

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- Header Image: Terraced farms, Uttarakhand https://commons.wikimedia.org/wiki/File:Terrace_Farms_of_Uttarakhand_India.jpg



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