Policy BRIEFING

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Addressing Climate Change Uncertainty in Dryland Kachchh, India

The semi-arid district of Kachchh in Gujarat, India is known for its erratic rainfall, water scarcity, and droughts. Climate change has intensified extreme temperature and rainfall patterns and also led to changes to the long coastline. These are affecting not only the lives and livelihoods of local people, but also threatening the vibrant ecosystem of Kachchh. While locals are pushed to the limits of coping, government interventions are driven by top-down measures. Strategies geared towards adapting to these changes need to be grounded in local experiences if they are to address the many uncertainties brought about by climate change alongside other rapid socioeconomic changes in Kachchh.

Climate change in Kachchh

Kachchh is the largest district in India, located in the state of Gujarat. The semi-arid district has a dynamic ecosystem, ranging from wetlands to grasslands, deserts, and a long coast with lush mangrove forests. Apart from its ecological diversity, Kachchh is also known for its cultural diversity and syncretism.

Water scarcity and droughts have always been a part of life in Kachchh and local people have used their own knowledge to cope with the uncertainties that these bring. Such local experience, however, rarely finds its way into policy interventions concerning dryland management and climate adaptation and mitigation. Since 2001, Kachchh has witnessed rapid industrial growth in the form of port development, special economic zones, and mining. These have rapidly transformed the district's ecology, especially the coast, and also undermined local people's rights to common property resources and local lands.

Climate uncertainty refers to the inability to predict the scale, intensity, and impact of climate change on human and natural environments. The project *Climate Change, Uncertainty and Transformation* seeks to bring together existing policy and scientific discourses of climate uncertainty with local knowledge systems and response strategies in order to make climate science more relevant. This should help decision makers draw on a wider range of options to address climate change issues.

Research was conducted in Kanmer, located in Rapar *taluka* (sub-district) bordering the Little Rann of Kachchh, and the coastal village of Jakhau in Abdasa *taluka*. These locations represent the district's key ecosystems (coastal, wetland, and dryland) and livelihoods (agriculture, animal husbandry, and fishing).

Livelihoods in the face of climate change

It is estimated that coastal areas such as the Gulf of Kachchh are likely to be the worst hit by climate change as agricultural lands have become susceptible to inundation and salinity, and cyclones and storm surges are likely to become more frequent. Rainfall in Kachchh has become more unpredictable with an increase in intense periods of rainfall and floods. While droughts have always been a part of life in Kachchh, floods have not.

Reduction in fodder and fuel availability, increased salinity ingress (freshwater aquifers turning salty), and depleting forest and groundwater resources have made livelihoods more precarious and vulnerable to shocks. The negative impacts of *prosopis juliflora* (an invasive weed), changing drought patterns, a high burden of livestock and crop diseases due to increased temperatures, and poor water quality have affected the major livelihoods – agriculture, animal husbandry, and fishing. For local people, coping responses include changes in cropping patterns (for farmers) and moving out of traditional occupations to adopt casual jobs (for fishers and herders).

Understanding climate change

For several generations, local people have deployed traditional knowledge such as observing seawater currents, animal and bird behaviour as well as planetary positions in the sky to predict seasonal patterns. Scientists found these predictions to be quite accurate up to 2005, but in the last decade these predictions have become less reliable.

While policymakers and non-governmental organisations concur that climate-related uncertainties have become acute in Kachchh, government interventions need to be more proactive. While government has undertaken many programmes concerning mitigation and adaptation, they have tended to be top-down and seldom reflect the ecological and social diversity of this district.

Industrialisation has intensified climate change impacts

The accelerated pace of industrial development in Kachchh is having a significant impact on local livelihoods. Following the 2001 earthquake, industrial zones and ports were set up to 'develop' this remote district. These have brought about changes in land use, biodiversity, and resource distribution that have intensified the impacts of climate change.

Intense groundwater extraction for industrial activities and the destruction of mangroves and related ecology have compounded the problem of salinity ingress, creating problems for agriculture and livestock. Industrial activities have reduced pastoralists' access to common grazing lands and are threatening the survival of indigenous *kharai* (swimming) camels. Many of Kachchh's traditional pastoralist groups such as the *Rabaris* and *Jats* are now having to give up pastoralism in favour of settled agriculture or migrant/casual labour.

Social inequality increases vulnerability

Despite the accelerated pace of 'growth', access to education and basic services remain challenging. Social inequities of caste, class, religion, and gender persist and lead to poor social outcomes. For example, with wells turning saline and poor drinking water infrastructure, women and especially young girls who bear responsibility of fetching water for household chores have limited time and opportunity to learn and go to school.

Policy implications

- **Support pro-poor adaptation:** Marginal environments such as Kachchh require pro-poor adaptation interventions that are linked with social development strategies that are ultimately more inclusive and address the vulnerabilities of marginalised groups. These may range from increased public expenditure on social sectors (schools, hospitals, and basic services) and employment to implementation of labour laws in new industries, as well as strengthening and protecting local ecosystems and biodiversity.
- **Recognise and incorporate local knowledge in policy:** Vital in ensuring coherent and effective response to climate change is the incorporation of local realities and understanding. Decision makers need to build on the existing knowledge systems and practices of local resource users.
- **Protect resource rights and livelihoods:** Sustained efforts (in law and policy) need to be made to protect the resource rights of poor communities as they provide a critical cushion to climate shocks. These rights must also be protected in the wake of industrialisation processes. Agro-pastoralist livelihoods which are more attuned to dryland dynamics should be supported and mainstreamed in adaptation interventions.
- **Promote inclusive development in the drylands:** Policymakers need to develop policies and strategies that are attuned to Kachchh's dryland dynamics and which support the needs of local farmers, fishers and pastoralists rather than those of powerful corporations and industrial actors. It is important that industrial development and economic growth in the district do not intensify social and gender inequalities. Focus must move to social and human development that is socially and gender just.

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Further reading

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Credits

This *IDS Policy Briefing* was written by **Shilpi Srivastava** and **Lyla Mehta** with inputs from **Mihir R. Bhatt** and **V. Vijay Kumar** and edited by **Vivienne Benson**. The opinions expressed are those of the authors and do not necessarily reflect the views of IDS. With thanks to the project team: Gujarat Institute of Desert Ecology, All India Disaster Mitigation Institute, Indian Institute of Technology – Bombay, Centre for the Study of Developing Societies, IIHMR University, University of Sussex, ESRC STEPS Centre, Institute of Development Studies, Norwegian Institute for Water Research, and the Norwegian University of Life Sciences. This research is supported by the Research Council of Norway.

Readers can find more information about the Climate Change, Uncertainty and Transformation project on the website: www.nmbu.no/en/faculty/landsam/department/noragric/research/our_projects/projects/node/21234

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