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Climate change impacts in Rajasthan: A mitigation approach

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Abstract

Climate change is a global challenge with diverse implications at the national and subnational levels, through impacts on various sectors such as agriculture, water resources, forestry and biodiversity, human health, energy and infrastructure. Such diverse impacts require a range of strategies to be deployed for an effective response and for better preparedness towards climate change. There is a need to achieve synergy between national priorities and state-specific strategies, given that in many cases the actions being discussed are State subjects and have to be implemented in the States. While adaptation by its very nature is localized in action, mitigation actions taken at the state level can tap on the opportunities that the State can benefit from or follow a co-benefits approach simultaneously buttressing national mitigation efforts. In this context, it becomes crucial to prepare State level action plans on climate change in order to address current and future climate risks and tap on potential opportunities through a diverse set of response strategies. The first step towards preparation of a detailed State Action Plan on Climate Change (SAPCC) is to identify state-specific risks and impacts and opportunities in the context of climate change. Thereafter, prioritize areas for research and policy action in response to identified current and future vulnerabilities and projected impacts of climate change. Effective policy design could be laid by juxtaposing identified strategies with national priorities and missions.

Keywords: Climate change, agriculture, water resources, state-specific strategies, vulnerabilities

Introduction

Climate change is the greatest global challenge facing us today which through a multitude of impacts poses a risk to our ecology, economy and society. Observation shows that changes being experienced in the climate of Rajasthan are over and above the natural climate variability prevailing in the region. Studies have shown that Rajasthan falls in areas of greatest climate sensitivity, maximum vulnerability and lowest adaptive capacity. Already, water resources in the State are scarce and have a highly uneven distribution both temporally and spatially. The State also has the highest probability of drought occurrence in the country. A threat such as climate change thus calls for timely and coherent policy response and action that will help reduce vulnerability and build resilience of the State to likely climate impacts.

India's national action plan on climate change

Climate change is a global challenge with diverse implications at the national and subnational levels, through impacts on various sectors such as agriculture, water resources, forestry and biodiversity, human health, energy and infrastructure. Such diverse impacts require a range of strategies to be deployed for an effective response and for better preparedness towards climate change. In 2008, a National Action Plan on Climate Change (NAPCC) for India was released by the Honourable Prime Minister. In view of the criticality of addressing the challenges posed by climate change along with the imperatives of poverty alleviation and economic growth for India, the NAPCC 'identifies measures that promote development objectives while also yielding co-benefits for addressing climate change effectively'. The focus of NAPCC is to improve the understanding of climate science, adaptation, mitigation, energy efficiency and natural resource management and conservation. The NAPCC, further sets eight priority missions to respond to climate change; these include National Missions on Solar Energy, Enhanced Energy Efficiency, Sustainable Habitats, Water, Sustaining the Himalayan Ecosystem, Greening India, Sustainable Agriculture and Strategic Knowledge for Climate Change, covering a range of response strategies.

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Contextualising the Need for State Level Actions

There is a need to achieve synergy between national priorities and state-specific strategies, given that in many cases the actions being discussed are State subjects and have to be implemented in the States. While adaptation by its very nature is localized in action, mitigation actions taken at the state level can tap on the opportunities that the State can benefit from or follow a co-benefits approach simultaneously buttressing national mitigation efforts. In this context, it becomes crucial to prepare State level action plans on climate change in order to address current and future climate risks and tap on potential opportunities through a diverse set of response strategies. The first step towards preparation of a detailed State Action Plan on Climate Change (SAPCC) is to identify state-specific risks and impacts and opportunities in the context of climate change. Thereafter, prioritize areas for research and policy action in response to identified current and future vulnerabilities and projected impacts of climate change. Effective policy design could be laid by juxtaposing identified strategies with national priorities and missions.

While the NAPCC provides a roadmap that can guide states to prioritize a set of strategies for the state, the Ministry of Environment and Forests (MoEF), has also developed a common framework with guiding principles (Table 1) that can facilitate the States to prepare their State Action Plans in line with the broad objectives of the NAPCC. This framework includes the following steps:

1. Conduct scientific assessment of climate observations and projections, sectoral impact and vulnerabilities, and prepare an inventory of greenhouse emissions in the state in order to identify vulnerable regions, sectors and communities for targeted adaptation and mitigation action.

2. Identify adaptation/mitigation options based on the Missions identified under the NAPCC, consideration of ongoing programmes and projects in the state, and identification of additional strategies that may not be covered directly under the eight national missions.
3. Prioritize adaptation/mitigation options by taking into account the national policies, sectoral strategies under the national missions and state level priorities, through multi-stakeholder consultations and interactions.
4. Identify financial needs and sources to implement selected adaptation/mitigation options (MoEF 2010). Table 1.1 Guiding Principles for Preparation of the SAPCCs (MoEF 2010) Guiding Principles for Preparation of the SAPCC
5. Implementing inclusive and sustainable development strategy that protects the poor and vulnerable sections of society from adverse effects of climate change
6. Undertaking actions that deliver benefits for growth and development while mitigating climate change
7. Ensuring and improving ecological sustainability
8. Building climate scenarios and investing in knowledge and research to reduce uncertainty and improve knowledge about appropriate responses
9. Assessing impact of climate change on existing vulnerabilities, and identifying and enhancing risk management tools for addressing climate change
10. Setting out options and evaluating and ranking them according to criteria (cost-effectiveness, cost-benefit, feasibility, ease of implementation, “no-regrets”, robust to different scenarios, incremental vs transformative change, etc.).
11. Identifying and implementing state-planned and community-based.

Table 1: Guiding Principles for Preparation of the SAPCC voluntary/autonomous adaptation

1.	Building broader stakeholder engagement to maximize perspectives and involvement in implementation.
2.	Addressing state-specific priority issues, whilst also creating appropriate enabling environment for implementation of NAPCC at state level.
3.	Considering governance and institutional contexts and ensuring appropriate institutional arrangements and building capacities, keeping in view the coordination, inter-departmental consultations, stakeholder involvement, and integration with regular planning and budgetary processes.
4.	Estimating additional resource requirements and exploring existing and new and additional carbon finance potential.
5.	Linking up with national policies and programmes for consistency and to identify financial or policy support that may be available.
6.	Implementing inclusive and sustainable development strategy that protects the poor and vulnerable sections of society from adverse effects of climate change.
7.	Undertaking actions that deliver benefits for growth and development while mitigating climate change • Ensuring and improving ecological sustainability
8.	Building climate scenarios and investing in knowledge and research to reduce uncertainty and improve knowledge about appropriate responses
9.	Assessing impact of climate change on existing vulnerabilities, and identifying and enhancing risk management tools for addressing climate change
10.	Setting out options and evaluating and ranking them according to criteria (cost-effectiveness, cost-benefit, feasibility, ease of implementation, “no-regrets”, robust to different scenarios, incremental vs. transformative change, etc.).
11.	Identifying and implementing state-planned and community-based

Voluntary/autonomous adaptation

Thought it is understood that the climate is changing, the nature of risks that are likely to emerge in the future is uncertain and the scale of impacts may vary from that being witnessed currently. In the case of adaptation, the suggested strategies should be able to deal with the ‘additional risks’ that climate change may pose in the future. Climate modelling, impacts and vulnerability assessment and emission profiling at the state level however faces a number of challenges in terms of capacities and resource availability to

conduct these exercises. Furthermore, capacities to adapt and mitigate relate to the current levels of socio-economic development. Therefore, while some of the strategies identified in the Rajasthan SAPCC build on going developmental programmes and schemes being implemented at the state level, new strategies are also suggested in the light of climate change. Hence, the SAPCC needs to be a dynamic document that should follow a regular interactive and iterative process to reflect new knowledge and developments at the national, state and local levels.

Rajasthan Environment Mission and Climate Change Agenda

Formulation of a Climate Change Agenda for Rajasthan (CCAR) in 2010 was an important beginning towards addressing climate risks in the state. Being the largest state in the country with unique vulnerabilities in terms of exposure to climatic extremes and varying capabilities for responding to the likely risks, and opportunities that can be tapped (such as harnessing solar energy), this was an important imitative by the state government. Rajasthan released a State Environment Policy (SEP) in 2010 identifying the key environmental challenges that the state must address to ensure continued sustainable development and economic growth that is equitable. The Rajasthan Environment Mission was constituted to bring into focus the high priority issues emerging from the SEP and CCAR, and mobilize government and non-government stakeholders to address these issues. Within the State Environment Mission, some sectors have been identified as being critical in terms of the climate change impacts on them. These include human health, agriculture and animal husbandry, enhanced energy efficiency including solar energy, and strategic knowledge for climate change. Under the Rajasthan Environment Mission, the CCAR listed a set of state priorities for adaptation and mitigation policy and action during the time period 2010-2014. State-specific missions for Rajasthan were developed highlighting research gaps and needs along with relevant policy measures, in light of the state's vulnerabilities and capacities. For each task force, certain research and development (R& D) needs as well as supporting policy and regulatory measures were identified. The CCAR identified a list of strategies under the following seven state level Task Forces constituted under the concerned Principal Secretary/Secretary of the Department.

1. Water Resources
2. Agriculture and Animal Husbandry
3. Forestry and Biodiversity
4. Human Health
5. Enhanced Energy Efficiency and Solar Energy
6. Urban Governance and Sustainable Habitats
7. Strategic Knowledge for Climate Change

Rajasthan Action Plan on Climate Change

The Rajasthan Action Plan on Climate Change (RAPCC) builds on the key areas as identified under the CCAR by prioritizing urgent areas of action in a phased and time-bound manner and is in coherence with the Rajasthan State Environment Policy and Environment Mission. While the RAPCC primarily focuses on risk reduction and adaptation measures, it also looks into the co-benefits offered by specific strategies in the form of mitigation.

Task Force Constitution

The Rajasthan State Government established a 'Climate Change and Clean Development Mechanism (CDM) Cell' in the Rajasthan State Pollution Control Board (RSPCB) to act as a nodal agency for coordinating issues related to climate change in the State. The Cell was constituted in April 2010 and was involved in the drafting of the CCAR. A Steering Committee has also been formed, headed by the Chief Secretary and Principal Secretaries of various key departments as members to monitor the implementation of various actions proposed under the Rajasthan Environment Mission. The State of Rajasthan has constituted a team to review the implementation of the Environment Mission. The composition of the Environment Mission includes the-

Chairperson: Chief Minister, Convener: Principal Secretary, Environment, Members: Ministers of the under-mentioned departments, Chief Secretary, Principal Secretaries and Secretaries in-charge of the of the under mentioned departments.

1. Environment
2. Forests
3. Mines and Petroleum
4. Industries
5. Water Resources
6. Command Area Development
7. Agriculture
8. Urban Governance
9. Transport
10. Energy, renewable energy
11. Science and Technology
12. Plan
13. Finance
14. Policy Planning

The Steering Committee is chaired by the Chief Secretary, headed by the Principal Secretary, Environment and members from each designated department mentioned above. The Steering Committee includes participation from the non-governmental bodies. Their role is to review the implementation of each of the mission. For the implementation of the Environment Policy, Rajasthan Environment Mission and Climate Change Agenda task forces have been constituted for different sectors, *viz.*,

1. Industry
2. Water
3. Forestry and bio-diversity
4. Urban governance and sustainable habitat
5. Enhanced energy efficiency including solar energy
6. Strategic knowledge for climate change

These task forces have been developed under the chairmanship of respective principal secretaries/secretaries, and concerned departments. Task forces for the sectors of agriculture and health are still to be constituted and are in discussion. Role of the task forces has been identified to develop concrete proposals for implementation of the various actions as indicated in the Mission document.

Conclusion

The priorities identified under the Rajasthan Action Plan on Climate Change (RAPCC) are in coherence with the overall development perspective of the State and was developed by adopting an inclusive and collaborative process with extensive consultations with various departments of Government of Rajasthan and other stakeholders. The RAPCC has been envisioned in concurrence with the guiding principles of the Rajasthan Environment Policy, 2010 [8]; Rajasthan Environment Mission, 2010 [8]; and the Climate Change Agenda for Rajasthan (2010-2014). The vision of RAPCC is 'to achieve sustainable development by reducing vulnerability to climate change impacts and enhancing resilience of ecological, economic and social systems in Rajasthan'.

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