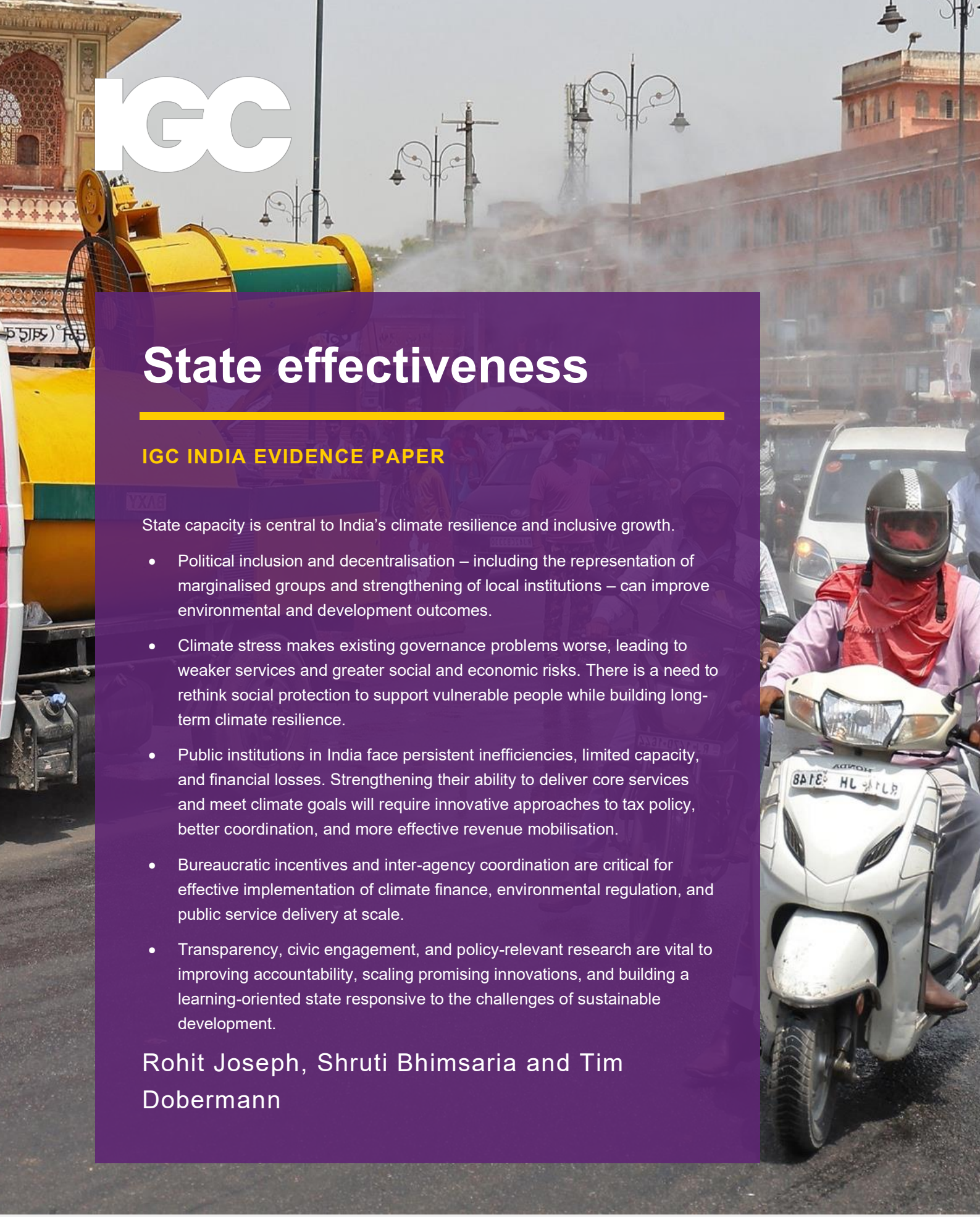

State effectiveness

IGC INDIA EVIDENCE PAPER

State capacity is central to India's climate resilience and inclusive growth.

- Political inclusion and decentralisation – including the representation of marginalised groups and strengthening of local institutions – can improve environmental and development outcomes.
- Climate stress makes existing governance problems worse, leading to weaker services and greater social and economic risks. There is a need to rethink social protection to support vulnerable people while building long-term climate resilience.
- Public institutions in India face persistent inefficiencies, limited capacity, and financial losses. Strengthening their ability to deliver core services and meet climate goals will require innovative approaches to tax policy, better coordination, and more effective revenue mobilisation.
- Bureaucratic incentives and inter-agency coordination are critical for effective implementation of climate finance, environmental regulation, and public service delivery at scale.
- Transparency, civic engagement, and policy-relevant research are vital to improving accountability, scaling promising innovations, and building a learning-oriented state responsive to the challenges of sustainable development.

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Introduction

An effective state with political stability and inclusive political institutions is key to long-run sustainable economic growth (Besley and Persson, 2009). Despite India's steady progress in increasing its per capita GDP, the past few decades have also been marked by worsening environmental externalities—particulate matter pollution, groundwater depletion, and rapid loss of forest cover. The growing consequences of such market failures are only worsened by climate change, jeopardising India's anti-poverty programs and public service delivery and leaving an estimated 27 million people at risk of becoming climate refugees (Singh et al., 2020).

This theme examines weak state capacity as a "critical binding constraint" (Muralidharan, 2024) to achieving sustainable economic growth in India and underscores the importance of institutions, social protection, and fiscal capacity. We review the extant literature on state fragility and the political economy of adapting to climate change and highlight specific challenges and actionable new policies for further research on enhancing state capabilities.

Governance and accountability

Fragility—marked by persistent conflict, weak institutions, and low state legitimacy—remains a central constraint on India's inclusive development and climate resilience. While India is not classified as a fragile state, subnational fragility persists in conflict-affected regions such as Central India (Naxalite insurgency), Jammu and Kashmir, and parts of the northeast. Escaping the fragility trap is central to building a functioning and flourishing state. Inter-group conflict along ethnic or communal lines undermines state legitimacy, creates policy uncertainty, and critically impairs the state's ability to provide public goods. Further, a negative shock to renewable resources and associated local labour incomes makes a conflict zone more vulnerable to targeted rebel violence and extortion (Eynde, 2018; Gawande et al., 2015), especially for developing countries such as India with long-standing low-intensity conflicts, including the Naxalite insurgency in central India and secessionist movements in the northeast and Kashmir.

Districts experiencing elevated drought and heat shocks report significantly higher incidences of crime, with agricultural distress mediating the relationship (Blakeslee and Fishman, 2018). These climate-conflict links are exacerbated in regions with limited state presence, where insurgents often fill institutional voids. Such patterns mirror global findings, where higher temperatures and droughts have been shown to raise inter-group conflict risk in low-capacity states significantly. Therefore, there is a need for rigorous empirical studies that examine how climate-induced stressors interact with subnational fragility and

shape long-term institutional erosion. There is also a strong case for policy evaluations that assess which conflict mitigation strategies—cash transfers, job guarantees, infrastructure delivery—are most effective in high-risk districts.

Political representation and state legitimacy

The fragility trap is further complicated by institutional exclusion and identity politics. Scheduled Tribes and other marginalised groups—who often reside in ecologically sensitive and under-governed areas—face systemic barriers to political representation and economic opportunity. However, there is evidence that inclusive political institutions can improve outcomes.

While more research is needed on policies and incentives that facilitate such political selection, a growing body of literature has emphasised the link between the identity and characteristics of the Indian political class and its performance in terms of sustainability and economic development indicators. For instance, Bandyopadhyay et al. (2024) use quasi-random variation in close mixed-gender elections to identify a 6% increase in annual forest cover growth in reserved assembly constituencies where a female legislator is elected (for historically marginalised groups such as Scheduled Castes and Scheduled Tribes). Greater political representation and related decentralisation of power via affirmative action is also a net winner, redistributing political and economic power to targeted minorities without affecting overall public service delivery (Besley et al., 2007; Gulzar et al., 2023; Pande, 2003). Future studies should explore the longer-term impacts of descriptive representation on economic mobility and conflict mitigation in India's most vulnerable regions.

Climate responsiveness and electoral accountability

States gain legitimacy when they respond effectively to citizen needs. In India, this legitimacy is increasingly tied to environmental and climate action. State governments respond strategically to weather-induced agricultural distress—especially in election years—by ramping up disaster relief and public food distribution (Besley and Burgess, 2002; Cole et al., 2012). Amirapu, Clots-Figueras, and Rud (2022) show that constituencies facing temperature shocks are more likely to elect agricultural candidates, who then increase investments in climate adaptation, such as irrigation. However, electoral cycles also create perverse incentives—such as relaxing air pollution norms or endorsing stubble burning before elections (Agarwala et al., 2024). We need a deeper investigation into how electoral incentives shape political behaviour under climate stress. What kinds of shocks shift electoral priorities? Can transparency

tools and early-warning systems improve the accountability of leaders during crises? Experimental designs and natural experiments are especially promising tools for understanding these behavioural dynamics.

Transparency, information, and civic institutions

Citizen monitoring and access to credible information are crucial in strengthening governance, particularly in fragile and low-capacity settings. Tools such as social audits, report cards, and grievance redress platforms can improve public servants' performance and increase electoral accountability (Banerjee et al., 2024b; Pande, 2011). Yet, climate and environmental risks often remain low-salience issues in voters' eyes, especially in regions where public understanding of these threats is limited.

Growing international evidence shows that civic engagement—particularly through digital platforms—can improve environmental outcomes. For example, citizens' social media appeals to environmental regulators in China have been shown to reduce pollution emissions and regulatory violations (Buntaine et al., 2024). In India, religious organisations and other non-state actors have begun to take on greater roles in public service delivery and disaster response, especially in underserved or conflict-prone regions (Batra and Prabhakar, 2024; Iyer et al., 2011). Their ability to shape social norms, mobilise voters, and influence behavioural change is increasingly relevant for climate adaptation. There is a pressing need to understand better how different types of civic information (for example, health-based versus economic versus moral arguments) can raise environmental awareness and shift political incentives.

The organisation of the state

India's ability to deliver inclusive climate adaptation and resilient economic growth hinges on how the state is structured and functions—from bureaucratic incentives to intergovernmental coordination. The growing complexity and urgency of climate challenges demand more nimble and capable governance structures that can operate effectively across central, state, and local levels. It also necessitates important questions on the role of bureaucracies in improving state capacity and implementing contentious climate policies at scale. How can effective states build, motivate, and manage strong bureaucratic systems?

I. Rethinking internal structures and incentives

Much research has explored improving public sector performance, particularly in health, education, and tax administration. Monetary and career incentives have been shown to shape outcomes: for example, Bertrand et al. (2019) find

that Indian Administrative Service officers respond strongly to promotion incentives; similarly, Muralidharan and Sundararaman (2011) demonstrate that teacher performance pay improves student learning. However, less attention has been paid to bureaucratic effectiveness in environmental governance, climate adaptation, and economic regulation—areas now central to the state's evolving role.

Building a more effective state does not always require creating new bureaucracies or launching large-scale reforms. Often, performance gaps stem from internal conflicts of interest, weak accountability mechanisms, or poor incentive design within existing institutions. By identifying these structural bottlenecks and redesigning internal rules and incentive frameworks, meaningful gains can be achieved without massive new institutional investments. Reforms that directly address these incentive failures—especially in how information is generated, verified, and acted upon—can strengthen enforcement and lead to better outcomes.

One compelling example comes from Gujarat's pollution auditing reforms. In the status quo, auditors were hired and paid by the firms they were inspecting—creating a clear conflict of interest that undermined enforcement. Duflo et al. (2013) evaluated a restructured audit mechanism in which auditors were randomly assigned, paid a fixed fee from a central pool, and rewarded for accuracy based on independent back-checks. This seemingly modest reconfiguration of how existing rules were organised produced significant improvements: auditors reported emissions more truthfully, and pollution levels declined. This example underscores how modifying the internal organisation of oversight systems—not just their size or scope—can increase regulatory integrity.

Further evidence from Duflo et al. (2018) shows that allowing regulators discretion to target inspections at high-polluting firms—rather than assigning inspections randomly—resulted in three times greater pollution abatement, highlighting the value of bureaucratic discretion when exercised within structured, well-incentivised systems. However, the broader challenge remains that de jure delegation does not always translate to de facto implementation. In Kerala, for instance, a reform aimed at decentralising pollution permitting to junior officers saw a third of applications retained by senior officials—particularly in more contentious cases—leading to reduced efficiency and welfare losses (Fenske, Haseeb, and Kala, 2024).

Horizontal coordination failures compound these frictions. Dipoppa and Gulzar (2024) show that bureaucrats are less likely to regulate farm fires if wind blows smoke into a neighbouring district rather than their own. Inaction is especially stark along the India–Pakistan border, where institutional mechanisms for

coordination are absent, illustrating how inter—jurisdictional failures worsen environmental outcomes.

While long-term improvements in bureaucratic capacity remain vital, policymakers in many Indian states must operate within tight resource and administrative constraints. In such contexts, smart policy design that leverages social networks and local actors can help deliver welfare-enhancing services. In Bihar, a flood early warning system combining advanced forecasting with incentivised local volunteers significantly improved community response and trust in alerts (Jagnani and Pande, 2024). Blending technological tools with grassroots outreach offers a model for last-mile delivery of climate services, especially in rural or low-capacity areas. Broader research in development economics also highlights how policy design and social networks can interact to ease implementation bottlenecks (Banerjee et al., 2019; 2021; 2024a).

II. Decentralisation and local climate action

Decentralisation is critical for improving state responsiveness and implementation, particularly in climate adaptation. Evidence suggests that smaller, more localised governments can improve service delivery and facilitate better citizen engagement—especially when public goods and risks are spatially concentrated. For instance, Bardhan (2002) and Narasimhan and Weaver (2024) argue that governments serving smaller populations tend to be more responsive, with increased scope for accountability, feedback loops, and local monitoring. This finding has direct implications for climate policy, which often demands context-specific solutions. Indian cities such as Ahmedabad have developed heat-health action plans (Knowlton et al., 2014), while municipalities in Delhi, Telangana, and Gujarat are piloting cool roof initiatives to protect low-income households from extreme heat (NRDC, 2022; 2023). These interventions exemplify how decentralised authorities can experiment, innovate, and respond swiftly to local climate stressors.

Decentralisation is not without risks. The spatial externalities inherent to air pollution, drought, and flooding often transcend local jurisdictions and require strong mechanisms for inter-jurisdictional coordination and vertical integration with state and central authorities. Without clear frameworks for shared financing, data exchange, and aligned incentives, decentralised climate responses may be fragmented, duplicative, or politically misaligned.

Research can play an important role in identifying the conditions under which decentralisation delivers effective and equitable climate adaptation. First, there is a need to evaluate how different institutional structures—such as tiered mandates, pooled financing mechanisms, and cooperative federalism frameworks—affect the ability of subnational governments to manage shared climate risks. Second, more work is needed to understand how local versus

state-level political incentives shape responsiveness to climate events and whether decentralised actors are more or less prone to short-termism in policy delivery. Third, research could explore what administrative, financial, or political coordination mechanisms enable effective cross-boundary collaboration for public bads like air pollution or transboundary water management. Lastly, comparative studies across states and cities could identify successful models of decentralised innovation in climate service delivery and the governance features that enabled them to scale or replicate effectively. Further research in these areas is crucial for designing responsive, agile institutions that can navigate the multi-scalar nature of climate governance in India.

Rethinking social protection

Rapid economic growth has significantly reduced global poverty levels. Even in India, a steady annual growth rate of over 6% has pulled nearly 190 million people out of extreme poverty between 1981 and 2013 (Page and Pande, 2018). However, cycles of discrimination, inequality, conflict, and natural disasters persist in many developing countries and weaken growth's ability to eliminate poverty at scale. In this context, social protection systems—spanning cash transfers, food distribution, workfare programs, and insurance—serve as invisible infrastructure during crises and are vital to upholding the state's social contract of dignity and inclusion.

Climate hazards have significant distributional consequences that make the design and expansion of social protection programs for marginalised groups an urgent priority. For instance, Shah et al. (2025) document caste-based inequalities in occupational heat exposure among Indian workers and suggest that occupational segregation and labour market discrimination contribute to "thermal injustice." Many Indians also live in climate hotspots, and recent surveys indicate that about 34% have moved or considered moving to a different area due to weather-related disasters, and a large majority expect to take several months or more to recover from a severe flood or drought (Leiserowitz et al., 2023). Thus, it is important to absorb climate migrants into existing social protection frameworks and account for seasonal and circular mobility patterns in disaster relief and public service delivery.

A key reform area is the portability of benefits across state and district lines. The COVID-19 lockdowns exposed the vulnerability of India's migrant workforce, many of whom were unable to access ration benefits or wage support due to domicile-linked eligibility rules. Although the One Nation – One Ration Card (ONORC) scheme has made strides in harmonising benefit entitlements across jurisdictions, evidence from UNICEF India and CPR (2021) shows that gaps persist due to administrative fragmentation, lack of data on seasonal and circular migration, and barriers in access or awareness.

Expanding real-time registries and interoperable ID systems can improve delivery, but more research is needed to understand the trade-offs between centralisation, flexibility, and local targeting.

Bihar's 'Corona Sahayata' scheme—an entirely digital initiative that transferred emergency cash support to migrant workers during the pandemic—is a powerful example of how states can design adaptive welfare delivery systems under tight timelines (Mukherjee, 2020). However, addressing structural poverty traps requires long-term investments in human capital, labour market support, and productive assets. Workfare programs such as MGNREGS have shown promise in buffering climate shocks and supporting livelihoods in rural areas (Kaur et al., 2019), but urban migrants often lack access to basic public goods such as education and healthcare despite legal entitlements under schemes like ICDS, SSA, and NFSA. Challenges around document portability, language barriers, and exclusion errors (Khera, 2019; Muralidharan, Niehaus, and Sukhtankar, 2025) remain under-examined in climate-sensitive urban settings.

While the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) continues to build macro and household-level climate resilience among rural populations (Kaur et al., 2019), urban areas tend to exclude migrants from accessing universal public goods like education and healthcare. Despite explicit provisions for migrants under the Sarva Shiksha Abhiyan (SSA), Integrated Child Development Services (ICDS) and the National Food Security Act (NFSA), inter-state migrants are constrained by limited portability, lack of identity documents, and limited instruction in their mother tongues at destinations (UNICEF India and Centre for Policy Research, 2021). More research is needed to understand these barriers and how new technologies to authenticate beneficiary lists amplify or alleviate concerns of exclusion (Khera, 2019; Muralidharan et al., 2025).

State governments and non-governmental organisations in India are also increasingly experimenting with parametric insurance products to fight extreme precipitation events and heat stress. While Nagaland has insured its entire population against flood stress, Kerala's Cooperative Milk Marketing Federation has launched heat-index-based insurance in six districts to cover cattle farmers' reduced milk production due to rising summer temperatures (Sirur, 2024). SEWA Bharat is also piloting an extreme heat income insurance scheme among 21,000 working women in four districts of Gujarat, with guaranteed payouts to their bank accounts when extreme temperatures render outdoor work impossible or unsafe. However, insurance penetration in India continues to be very low. Recent concerns of basis risk (where high thresholds trigger no payments despite substantial damages) in the pilot experiments necessitate rigorous evaluations of the effectiveness and scalability of hazard insurance schemes in low-income settings.

Further, additional research is needed to ascertain whether social protection is best delivered in cash or in kind. While the literature has emphasised general equilibrium effects, risks of inflation, and deadweight losses in developing countries (see Abbink et al. [2024] for recent evidence from low-income urban neighbourhoods in Maharashtra), this question has not been sufficiently explored in the context of climate change and environmental crises. A key open question is whether conditionalities in cash transfers or innovative contract designs (Izquierdo-Tort et al., 2024) can enable lasting gains in climate change adaptation relative to unconditional benefits targeting. This question is especially relevant for lower-income countries like India, where distrust and liquidity constraints are significant barriers to contract adoption, and small upfront payments can incentivise compliance (Jack et al., 2025).

Raising revenue and policy coordination

In many weak states, public utilities and service delivery are riddled with deficiencies and losses. Growing climate commitments have also increased the demand for long-term investments in climate adaptation and mitigation projects, even as higher tax rates become politically unpopular. New forms of revenue mobilisation and tax reforms lie at the heart of resolving this deadlock since the tax-to-GDP ratio in low- and middle-income countries is stuck at an abysmal 10%-15% of the GDP.

A growing literature on taxation in low- and middle-income countries suggests a judicious mix of low-cost enforcement mechanisms, higher sanctions, and incentives for third parties to improve compliance and maximise revenue efficiency. However, poor monitoring systems, outdated technology, and low state capacity in tax administration can render audits and sanctions ineffective. This effect is exemplified by Barwahwala et al. (2024), who used a machine learning algorithm to identify fraudulent, non-existent firms in an Indian state. However, model-driven inspections of suspicious firms do not result in a corresponding increase in cancellation of firm registrations or tax recovery. These inefficiencies indicate the need for more research on institutional frictions preventing information sharing and tracking of firms within and across central and state tax units. Similarly, future research could examine the feasibility and effectiveness of technology-driven process monitoring systems in tax collection and recovery.

Pigouvian taxes on emissions and similar environmental externalities are another popular option to increase tax revenues. The negative distributive consequences of such taxes make them politically unpopular in developing countries heavily dependent on carbon-based energy sources. Aggarwal (2025) analyses data on formal manufacturing in India between 2009-10 and 2019-20 and reaches a similar conclusion: labour and coal-based energy sources are

complementary inputs in production, and a carbon tax along the lines of the 2010 national coal cess could reduce manufacturing employment in the short-run. India's productive efficiency stands to benefit from reducing similar tax distortions, as seen in the switch from a sales tax to a value-added tax (Agrawal and Zimmerman, 2019).

Rationing of commons and productive public spending is fast becoming a politically feasible alternative to higher energy pricing and taxes. This alternative is especially important in rural India, where higher tariffs on groundwater use and metered electricity can have adverse distributional consequences for smallholder farmers, and poor beneficiary targeting renders socially optimal pricing ineffective (Ryan and Sudarshan, 2022). Systematic evaluations of various smart metering features, including prepaid metering, online tracking, and group payment incentives, are underway in Bihar, Haryana, and Jammu and Kashmir and can create a robust evidence base on the effects of smart metering on sustainable energy use.

Recent research on Punjab's Pani Bachao, Paisa Kamao (PBPK) scheme suggests that uninterrupted daytime electricity supply and cash incentives for unused electricity can substantially alter groundwater pumping behaviour. In contrast to a similar pilot (Fishman et al., 2016) that allocated "electricity entitlements" to tubewell owners in Gujarat and found no significant changes, the PBPK scheme saw a 7.5% to 27% decrease in electricity consumption and irrigation hours at the feeder level (Mitra et al., 2022). The resulting reduction in electricity subsidies and the public utility's financial risk will likely make such policies a political winner.

Gaps in enforcing existing command-and-control environmental regulations and alarming levels of air pollution have since forced India to experiment with pollution markets for particulate matter. In a promising development, an experimental evaluation of this market for particulate matter emissions in Gujarat has found them to be well-functioning, as well as reducing emissions (by 20% – 30%, relative to control plants) and abatement costs (Greenstone et al., 2025). While low state capacity often limits the use of market-based instruments, their ability to reduce emissions at seemingly small costs merits greater consideration, and the launch of new pilots in Ludhiana, Punjab and Ahmedabad, Gujarat, are exciting developments.

Finally, effective states have a commitment to economic and social justice. Given the global nature of climate change and the promise of cost-effective carbon reduction investments in developing countries, how do we think about meaningful climate diplomacy that balances equity and cooperation? Pande (2024) finds a future in a novel voluntary compliance market with companies in high-income countries and project developers in developing countries participating, with the former responsible for net-zero targets via emission reductions of their own and financing less costly reductions in the latter. More

research is needed to understand the nature and extent of carbon leakages and novel ways to fund and facilitate technology transfer for lasting adaptation gains in South Asia.

State effectiveness and climate change in India

India's ability to respond to climate change increasingly depends on its state institutions' strength, agility, and legitimacy. As the scale and complexity of climate risks grow, it is not just policy ambition but the effectiveness of administrative systems—across finance, regulation, welfare, and coordination—that will determine outcomes. Building a climate-capable state in India requires addressing three key priorities: enhancing institutional capacity to access and deploy climate finance, embedding climate adaptation within public service delivery, and rigorously measuring policy impact to enable scaling of successful interventions.

I. Strengthening institutional capacity for climate finance

India's ability to mobilise and utilise climate finance effectively remains uneven. Many state departments face capacity constraints in preparing detailed, fundable climate proposals, complying with reporting requirements, or coordinating across agencies. Accessing international and domestic climate funds requires technical and administrative expertise—skills often concentrated in a few central agencies. Establishing dedicated climate finance units within state finance departments or planning bodies can help close this gap. These specialised teams could ensure that climate priorities are integrated into annual budgeting, support line departments in proposal development, and monitor fund deployment transparently. Research can play a role in evaluating how such institutional models affect project uptake, speed of disbursement, and downstream impact.

II. Embedding climate adaption in service delivery

Delivering climate resilience at scale requires more than financing—it demands robust implementation systems that work across sectors and regions. Several Indian states have introduced promising pilots, such as flood early-warning systems in Bihar and heat-indexed income insurance in Gujarat. However, these initiatives often remain isolated without systematic monitoring and evaluation, with limited replication or scale-up. Embedding rigorous evaluation into programme design—particularly for climate-related agriculture, infrastructure, and health interventions—can help identify what works, inform policy iteration, and build a culture of adaptive governance. Developing partnerships between public agencies and research institutions is vital to

institutionalise evidence generation and support learning across geographies and time horizons.

III. Designing climate-responsive social protection systems

India's welfare architecture must evolve to reflect the lived reality of a population exposed to frequent and severe climate shocks. Low-income households, informal workers, and migrants are particularly vulnerable, yet they often fall outside the reach of traditional safety nets. Expanding the portability of entitlements—such as food rations, cash transfers, and insurance—is essential for ensuring resilience among mobile populations. Initiatives like the One Nation – One Ration Card (ONORC) are steps in the right direction, but many benefits remain tied to fixed locations or require documentation that is difficult for transient populations to maintain. Meanwhile, workfare programs like MGNREGS can be reframed to include climate-resilient assets such as water harvesting, soil conservation, and green infrastructure. Research is needed to evaluate how to integrate dynamic eligibility, spatial targeting, and climate vulnerability indicators into beneficiary identification and delivery systems, particularly in urban areas where coverage gaps are more pronounced.

IV. Building adaptive and learning-oriented states

Underlying the above is a broader need to embed learning into how Indian states function: institutionalising monitoring systems, enabling flexibility in programme design, and creating space for experimentation and course correction. Climate risks are dynamic and location-specific, so a one-size-fits-all model is unlikely to succeed. Instead, success will come from states that can innovate, fail safely, and scale what works. Research must play a key enabling role in evaluating impact and co-designing policy with government partners and identifying system-wide reforms. Investments in administrative data systems, public dashboards, and open evaluations can help build citizen trust and improve accountability for climate outcomes.

Conclusion

India's ability to meet the challenges of climate change will depend not only on new policies or external finance but on the effectiveness, adaptability, and legitimacy of the Indian state. As this paper has shown, climate change intersects with nearly every domain of state capacity—from delivering public goods in fragile districts to managing environmental regulation, from intergovernmental coordination on transboundary risks to the portability of welfare entitlements for vulnerable, mobile populations.

Effective climate action will require institutional reform, not institutional expansion. Targeted improvements in bureaucratic incentives, inter-

jurisdictional coordination, local government autonomy, and digital infrastructure can go a long way in translating national ambitions into grounded implementation. Strengthening state capacity to design, finance, and evaluate climate-sensitive programs must be prioritised—especially at the subnational level, where many of these challenges are most acutely felt.

The report also underscores that state effectiveness is not only about capability but also about credibility and inclusion. Whether expanding adaptive social protection to underserved groups or ensuring environmental compliance in politically sensitive regions, states must be trusted by their citizens. Enhancing transparency, fostering civic engagement, and building feedback loops through local institutions will be essential to sustain policy momentum.

Research has a central role in this transformation. From testing new policy instruments and institutional structures to generating real-time data for decision-making, India's research and policy communities must work hand in hand to support a learning-oriented state. As climate risks intensify, this partnership—between knowledge and implementation—may well determine whether growth is not just sustained but also equitable and resilient.

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