

## Climate Governance and Federalism in India

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### 9.1 Introduction

The art of governing India is in no small part the navigation of tensions in Indian federalism. The country is large – both in geographic size and population – has an extraordinary cultural diversity, and is composed of constituent units with radically different economic histories. Indian federalism has moved back and forth between periods of central dominance to coordinate divergent interests and state autonomy to satisfy local demands.

These oscillations, over the seven decades since independence, influence India's prospects for climate action today. The federation began life with a strong national government ('the Centre') sustained by ruling party alignment in the Centre and states, and animated by a focus on centralized industrial growth (Tillin 2019). Centrifugal forces occasioned by the assertion of regional identities then led to a new era, in which upstart regional parties focused on populist agriculture and electricity policy (Dubash and Rajan 2001), among other areas, to bolster their electoral prospects. At the end of the twentieth century, economic liberalization heralded the birth of competition and growing disparities between states (Sáez 2002; Subramaniam and Kumar 2012). We have now returned to a period of central dominance (Aiyar and Tillin 2020), which, as we shall see, is beginning to shape India's energy transition.

It is on this ever-shifting federal terrain that a modern edifice of climate governance must be built. Where, then, is the firm ground? Are there enduring characteristics of Centre–state relations that let us arrive at a relatively stable description of Indian climate governance? In this chapter, we put forward a synthetic account of the forces shaping climate governance in India's federal architecture, building on descriptions of environmental federalism (Arora and Srivastava 2019; Chakrabarti and Srivastava 2015; Huang and Gupta 2014); state actions in climate policy (Dubash and Jogesh 2014; Jørgensen et al. 2015; Kumar 2018); and several recent policy moves by both the Centre and states.

India's highly centralized form of federalism, once famously categorized as *'sui generis'*, (Sarkaria et al. 1988), offers a context for climate governance that differs from most other chapters in this volume. Though much more centralized than the classical US model, it is many steps short of Germany's top-down administrative federalism. India's states enjoy substantial autonomy in many areas of mitigation and adaptation, but the federal government holds the reins of state finances, constitutes the bulk of bureaucratic capacity, and exercises jurisdictional authority in several areas of climate policy. This creates an awkward climate governance gap because many climate actions require sustained attention and policymaking from the constituent units. This asymmetry makes close and fairly nuanced forms of cooperation between the Centre and states a structural necessity in climate matters.

The federal system has begun to adapt to this structural weakness. The Centre has been involved in developing new financial mechanisms and supplementing state capacity for climate action. The states have, in response, occasionally taken fragments of the national agenda and adapted them to local political contexts that were hitherto innocent of 'climate' politics – at least phrased as such – thereby fulfilling the potential for localized experimentation latent in federations. Some of these experiments have shaped the national policy landscape through vertical diffusion, having been picked up by the central government and injected into the idiom of governance across India's states.

What emerges is a federal system that episodically attempts to rebalance itself through new institutions, experimentation, and diffusion. But this righting reflex is the function of a series of uncoordinated variables – spurts of policy activity driven by foreign policy objectives, independent developments in fiscal federalism, and opportunistic states – and falls short of a new compact in Indian federalism. Climate policies thus episodically appear, and fade away, across the federal landscape.

After providing an overview of climate change in India and its policy responses, this chapter describes India's federal architecture and environmental governance processes before showing how the federal system is adapting to the climate challenge. In the conclusion, it reflects on the inherent vulnerabilities of this form of climate governance.

## 9.2 Climate Change and India

India's importance in the climate crisis is rooted in the country's size, growth rate, and low economic starting point. It is a country of 1.2 billion people with weak development indicators (Conceição 2019) but has grown rapidly in recent decades as it pushes to join the ranks of middle-income countries. Its per capita income, adjusted for purchasing parity, grew 162 per cent in the two decades since

2000 (World Bank 2020).<sup>1</sup> Emissions have grown concomitantly, slightly more than doubling between 1994 and 2016. Three-fourths of India's emissions are from the energy sector (40 per cent of all emissions are from electricity generation and 9 per cent from road transport); agriculture is around 15 per cent; and industrial processes and product use nearly 8 per cent (Government of India 2021). In 2018, it was the third largest emitter (Global Carbon Project 2019). At the same time, its per capita emissions are a third of the global average, placing equity concerns at the centre of its assessment of mitigation responsibilities (Dubash et al. 2018).

India has long held a diplomatic stance that seeks to avoid constraints on its development. The use of per capita metrics to underscore equity concerns around decarbonization are, consequently, an early and consistently prominent feature of Indian climate politics (Dubash et al. 2018). Its position has been central to the evolution and practice of the principle of 'common but differentiated responsibility' (Sengupta 2013), which places the onus of emissions reductions on developed countries that, India argues, caused global warming through excessive per capita emissions as they grew (C. Dasgupta 2019).

Despite a stable diplomatic scaffolding for its interests, India has been responsive to shifts in global climate politics. A spurt of climate policymaking from 2007 to 2009, triggered by mitigation pressures on developing countries during the Copenhagen Conference of Parties (COP), resulted in a National Action Plan on Climate Change (NAPCC) that laid the institutional and programmatic foundations for action across a set of eight 'missions' that covered both mitigation and adaptation themes. The central government used the NAPCC to draw the contours of state climate governance in this period by requiring the creation of State Action Plans on Climate Change (SAPCCs), thus placing climate change on the agenda of central and state governments for the first time (Pillai and Dubash 2021).

India made its first numerical emissions pledge at Copenhagen, followed by expanded and relatively more ambitious pledges at the Paris COP in 2015 (Dubash et al. 2018). India's 2022 NDC centred on pledges to reduce its emissions intensity by 45 per cent between 2005 and 2030; increase non-fossil fuel sources to about 50 per cent of installed electricity capacity by 2030 (with technology transfers and international finance); and create an additional carbon sink of 2.5–3 bn tons of CO<sub>2</sub> equivalent. It has also increased engagement in the broader regime complex for global climate governance, with participation in multi-lateral forums for hydrofluorocarbons and aviation regulation (Ghosh 2019) among others.<sup>2</sup>

Domestically, India does not have formal climate legislation at either the federal or state levels. Major political moments, such as the ratification of the Paris Agreement, have not stimulated legislative activity either through consideration of

climate in new laws or amendments to existing laws. An important reason is the centrality of ‘co-benefits’ – the simultaneous achievement of development and climate gains – as a motivating narrative (Dubash 2013), which has thus far been accommodated within the scope of existing legislation. Consequently, the institutional structure is composed of a thicket of sectoral climate plans and relevant legislation that antedate the rise of climate change in the governance discourse of the late 2000s. Such laws include the *Electricity Act* of 2003,<sup>3</sup> which creates a legal basis for the nation-wide promotion of renewables; an energy conservation law (2001); and legislation on forests, water, air, biodiversity, and the like. The current governance approach is thus contingent on the creative interpretation and deployment of a variety of sectoral institutions and frameworks.

This architecture must adapt to the challenges of a country particularly vulnerable to climate change. The IPCC (Intergovernmental Panel on Climate Change) projects that countries in South and Southeast Asia will be most at risk from coastal flooding at all levels of warming, with India ranking among the most vulnerable globally (Hoegh-Guldberg et al. 2018, 231). Its long coastline will witness an increase in severe cyclonic storms while the densely populated Indo-Gangetic Plain will face the retreat of the Himalayan glaciers that nourish it (Krishnan et al. 2020). An economy dependent on agriculture will have to manage an increased propensity for droughts and a decrease in summer monsoonal rainfall (Krishnan et al. 2020). Cities will suffer from heat stress, with Kolkata potentially suffering from ‘deadly’ heat waves annually with 2 degrees of warming (Hoegh-Guldberg et al. 2018, 242). Poorer populations are more likely to be exposed to compounding climate effects, from droughts to water stress, habitat degradation, and lower crop yields (Hoegh-Guldberg et al. 2018, 245). India’s federal structure – particularly the states’ ability to respond and the Centre’s capacity to even out capacity differences – assumes particular salience in this context.

### 9.3 India’s Top-Heavy Federalism

India was forged at a moment of political upheaval and partition, forcing the Constituent Assembly to adopt a centralized federal model to ensure stability. This was also in keeping with emerging trends in federalism in the wake of the Second World War, when large federations began building empowered central governments capable of delivering welfare in pensions, insurance, and healthcare (Tillin 2019). In post-independent India, the inclination was for a powerful central government that sought to shape provincial policy through central planning (Tillin 2019).<sup>4</sup>

The Sarkaria Commission Report, a prominent reform effort to address irritants in federal relations, described what resulted as ‘a *sui generis* system of two-tier

polity in which the predominant strength of the Union is blended with the essence of co-operative federalism'. Several features of the Constitution, they thought, 'appear to have been deliberately designed to institutionalize the concept of co-operation' (Sarkaria et al. 1988, 1.3.28) rather than full-fledged state autonomy. Other commentators have described the structure as 'quasi-federal' (Wheare 1964, 28). As we show below, the states enjoy legislative powers in several areas, but these domains are often influenced by the Centre. This places India somewhere between the classical model of devolution in the USA and Germany's highly integrated 'administrative federalism' (see Hueglin and Fenna 2015 and Mueller and Fenna 2022 for more on the varieties of federalism).

The original Constitution did not recognize the environment as a distinct area of governance, but related sections, subsequent amendments, and patterns in central legislation have since lent the federal government a dominant role. Article 253 of the Constitution importantly allows the Centre to legislate on the subject matter of international treaties, regardless of whether they concern matters exclusively under state jurisdiction (Huang and Gupta 2014). This provision has been particularly important in the development of Indian environmental law and has paved the way for landmark central legislation including the *Environment Protection Act 1986* (Chakrabarti 2015). The Act gives sweeping powers to the central government, allowing the Centre to 'take all such measures as it deems necessary' to protect the environment and gives it power to lay down 'standards for emission or discharge of environmental pollutants from various sources whatsoever' – though 'environmental pollutants' has not yet been interpreted to include carbon by any court.<sup>5</sup>

In climate governance, the division of powers in the Constitution (laid out in Schedule VII) leaves both the Centre and states with important roles, calling for a mix of top-down direction-setting and resource flows, and bottom-up state-driven policy. The Constitution gives the Centre a hand in several realms of climate governance such as mines and petroleum, industry, and interstate waters. The 42nd amendment to the Constitution, passed during a period of unprecedented centralization and a suspension of democratic rights, placed forests and wildlife in the concurrent list of the Constitution (Chakrabarti 2015) – allowing both levels of government to legislate, with the Centre prevailing in the event of a conflict. The legacy of Indira Gandhi, recently interpreted as an environmentalist prime minister (Ramesh 2017), underpins the Centre's ability to dictate the use of forest lands, and consequently influence related areas of agriculture and water governance. The Centre also enjoys residual powers that allow it to legislate in areas not explicitly listed in the Constitution.

On the other hand, several important areas of climate governance – such as local government, agriculture, and water governance – are the constitutional preserve of

state governments. But state policy in these areas is constantly shaped by numerous national schemes (Ministry of Finance 2020) and centrally designed ‘model legislations’ offered to states. Electricity, which produces over two-fifths of India’s emissions (Government of India 2018) and is a crucible of state politics, is in the concurrent list, with the Centre historically defining the framework within which states operate<sup>6</sup> while the states determine policies and the extent to which central guidance is implemented. The states thus play the primary role in adaptation and a substantial role in mitigation, thereby underscoring the need for new federal institutions to rebalance governance capability to the states in these areas.

The fiscal power of the Centre accentuates its structural dominance. States are responsible for implementation, but major sources of tax revenue are allocated to the federal government (Finance Commission of India n.d.). This imbalance has led to corrective institutional channels such as the Finance Commission, a Constitutional body that recommends tax devolution, its distribution between states and various conditional grants, and the Planning Commission, which until 2014 prescribed funds for state development plans (Aiyar and Kapur 2019). The prominence of conditional transfers in this mechanism further restricts state autonomy because they prescribe policy in nearly every governance area (Parikh and Weingast 1997; Rao and Singh 2004). Tillin captures the extent of central dominance (Figure 9.1) by showing that, on average, states raise only 45 per cent of their revenue from sources under their jurisdiction. An important feature is the wide disparity in states’ fiscal autonomy.

This asymmetrical federal layout in legal and fiscal realms emphasizes the importance of institutional forums in reaching an agreement on the pace, depth, and cost of climate governance. Climate-specific interactions are channelled through the National Steering Committee on Climate Change (NSCCC), a body composed of several senior central bureaucrats and some chief bureaucrats from the states. The body is less a platform for deliberation than one designed to monitor state actions by ensuring ‘uniformity and coherence’ in the SAPCCs, provide guidance on individual projects, and approve financial allocations for them (MEFCC 2017). Alongside the NSCCC sits an assemblage of non-climate forums that could affect climate outcomes, such as an annual meeting of energy ministers (Ministry of Power 2018); a forum of electricity regulators (Forum of Regulators 2005); and a currently inactive Inter-state Council that could play a role in several areas including the vexing question of governing interstate river disputes (Chokkakula 2019).

#### **9.4 Emergent Climate Corrections to Top-Heavy Federalism**

Recent developments in the federal system show that the Centre and states are redefining their roles to advance climate policy within the constraints of India’s

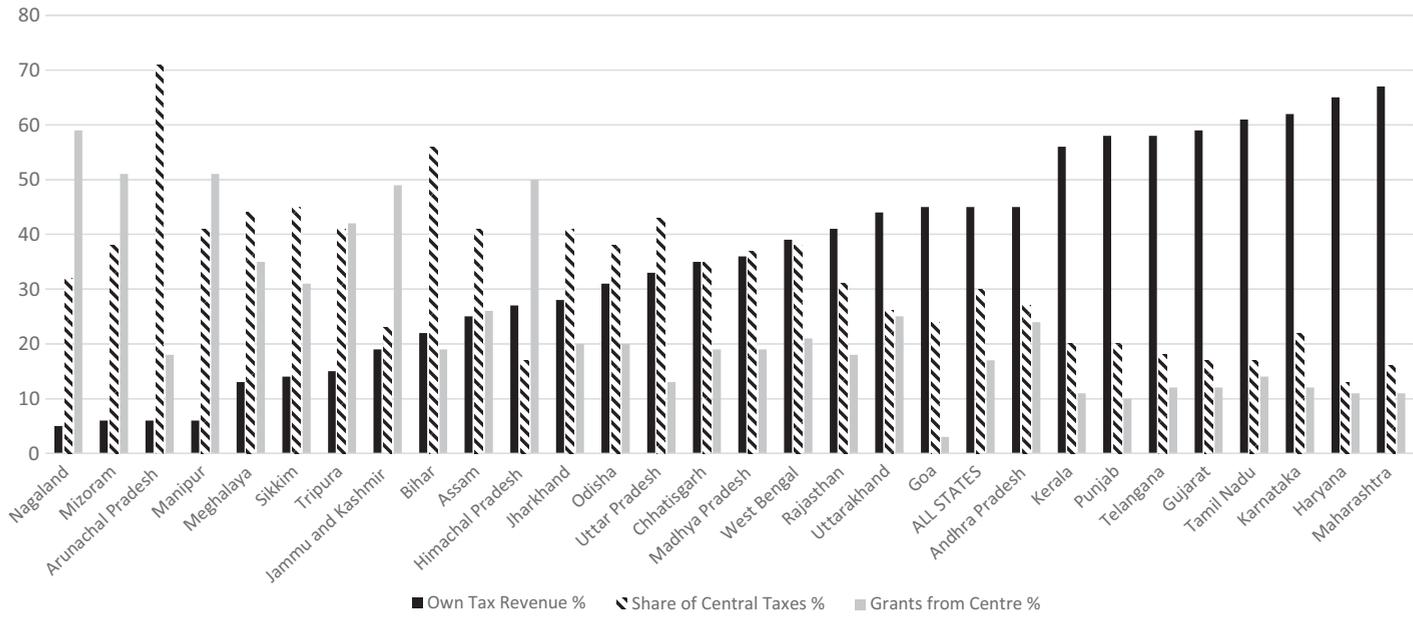


Figure 9.1 State dependence on central transfers in 2016–17 (adapted from Tillin 2019, p. 72).

federal inheritance. This includes the emergence of new priorities in fiscal federalism; national frameworks and capacity to stimulate state action; and political work in the states to make climate priorities locally relevant, policies that are occasionally picked up at the national level.

### ***9.4.1 Federal Finance Flows***

The structure of fiscal federalism described in the previous section leaves climate actions partially contingent on new and repurposed financial channels. Over the last decade, fiscal mechanisms have begun to evolve shades of climate responsiveness though these are undeniably subtle tones on a broader canvas. As we show below, they include the incorporation of vulnerabilities into tax devolution by the Finance Commission, the adaptation of some large central government schemes to climate goals, instruments for project-specific central support, and the deployment of central state-owned enterprises to underwrite the renewable transition.

#### *9.4.1.1 Environmental Focus in Finance Commissions*

Moves from recent Finance Commissions to include forestry and disaster management variables in their decision framework are among the more important developments in India's nascent climate federalism. The 14th Commission (2015–20) took a bold step in incorporating the state's forest cover as a variable in deciding the quantum of devolution, giving it a 7.5 per cent weightage among four other criteria. The 15th Commission (2021–6) then increased the weight to 10 per cent (XIV Finance Commission 2013; XV Finance Commission 2020). These Commissions argued that states must be compensated for the large opportunity cost in maintaining forests, thus potentially creating political space for pro-forest policies. The 15th Commission, interestingly, uses India's international commitment to increasing forest cover, among other things, to justify its actions – representing a minor link between international processes and India's fiscal structure.

The 15th Commission also reframes the task of disaster management by forcefully arguing for a move away from a disaster-response paradigm to one based on preparedness. They establish substantial fiscal transfers based on metrics related to state capacity, risk exposure, and vulnerability. Given the consultative nature of the Finance Commission, these developments might indicate growing political recognition of climate risks. Indeed, the interim report of the 15th Commission notes that both state and central governments 'argued that issues relating to environment and climate change need to be given greater impetus' during consultations (XV Finance Commission 2019, 4).

#### 9.4.1.2 Central Schemes in Climate-Relevant Sectors

The Finance Commission's priorities sit alongside the Centre's role in shaping state priorities through its national programmes. For example, of the thirty-five mitigation actions listed in India's 2018 Biennial Update Report to the UNFCCC, over one-quarter (ten) have the central government intervening in areas under state control such as agriculture, local government, and industry.<sup>7</sup> Seventeen interventions fall in the concurrent list that are the joint responsibility of the Centre and states while the rest fall under exclusive central or state control (Government of India 2018, 142–50).

This is in keeping with a long-standing tradition of central involvement in state responsibilities through Centrally Sponsored Schemes (programmes designed and largely funded by the Centre) and state plans (Parikh and Weingast 1997). For the period of India's 11th Year Plan (2007–11), CSSs accounted for 40 per cent of central transfers to the states (Aiyar and Tillin 2020), putting it in a league similar to devolution and grants from the Finance Commission. In 2014–15, there were '66 CSSs ... financing all the major social policy programmes of the time' (Aiyar and Kapur 2019, 192). CSSs will thus almost inevitably play a role in stimulating future climate action in the states but suffers from unidirectionality; there are no institutional mechanisms that allow states to contribute to design decisions (Tillin 2019).

#### 9.4.1.3 Federal Financial Experiments

In the wider landscape of state climate finance, these large financial conduits combine with smaller, but still notable, institutional innovations. The NSCCC, the designated body for federal interactions on climate projects, gives the states more discretion in defining their climate priorities than central schemes or Finance Commission flows, but for far smaller sums.<sup>8</sup> States conceive climate programmes and present them to the senior bureaucrats of the NSCCC, which might then offer assistance, approval, and funding (Parliamentary Committee on Estimates 2018). It must be pointed out, however, that minutes of NSCCC meetings obtained through Right to Information requests reveal displeasure within the NSCCC from senior environment ministry officials, who criticized project proposal quality and lamented the slow utilization of funds (MEFCC 2017).

A second institutional innovation comes in the subtle backroom role the Centre plays in adding renewable capacity across the states. The Centre's power trading companies are, for example, the listed buyers for about half of all solar capacity auctioned in India and act as a buffer between private generators and financially precarious state utilities (India RE Navigator 2020). The Centre also drives the hectic pace of India's renewable capacity expansion and indirectly shapes the

states' electricity mixes; our analysis of solar capacity auctions from 2010 to 2020 shows that central enterprises were responsible for auctions of almost twice as much solar capacity as state agencies.<sup>9</sup> At the more punitive end, it also tries to reassure investors and developers by imposing penalties on states for defaults on renewable contracts (by withholding fund transfers), thereby leveraging its dominant financial position (Atal et al. 2018).

### ***9.4.2 Central Frameworks and Capacity***

The federal government has also played a role in establishing normative frameworks for climate action in the states, indeed pushing them to think about climate change when it was not a priority, while also occasionally directing specialized capacity to state capitals. This notionally balances the uneven levels of interest in climate change in state capitals and their nearly universal bureaucratic constraints.

#### *9.4.2.1 Central Frameworks for State Climate Policies*

Unlike several instances in this volume, subnational policymaking in India did not develop organically. It was instead mandated by the central government during a period of heightened climate activity. The creation of the NAPCC forced the environment ministry to consider ways of seeding climate policy in the states, resulting in SAPCCs in thirty-two states and federal territories by 2018 (Parliamentary Committee on Estimates 2018).<sup>10</sup> Though the process has had limited effects, with some observers criticizing them for 'falling woefully short of dealing with the climate-related challenges India is facing' (Kumar 2018, 36), the process put climate policy on the agenda of state governments.

This top-down process has had its drawbacks, notably in the smothering effect of the NAPCC. The SAPCCs were found to replicate the NAPCC, likely because few states embarked on rigorous investigations of their vulnerabilities (Dubash and Jogesh 2014; Kumar 2018). Additionally, central influence constrained the planning exercise by forcing states to prioritize adaptation over mitigation actions to prevent them from undercutting India's international negotiation position (Dubash and Jogesh 2014).

The SAPCC effort was further weakened because they did not lead to a dedicated flow of central financing. States were instead expected to meet expenses through their approved 12th Plan outlays for discretionary expenditure and several smaller pools of central finance (MEFCC 2014). The absence of a large capital infusion seems to have diminished the states' enthusiasm (Kumar 2018). While SAPCC projects could receive funding on a project-by-project basis through the

NSCCC mechanism, this is of small quantum, has high transaction costs, and is subject to central approval.

The Centre reportedly also advised states to dovetail their actions with central schemes like the massive national rural employment programme (Kumar 2018). There were early indications that some states actively experimented with this approach and considered combinations with external donor funding (Dubash and Jogesh 2014). This fiscal tension is compounded by an alleged perception in Delhi that states were hoping to execute a money-grab to finance other developmental initiatives, 'out of greed and not specific need', through the SAPCCs (Kumar 2018, 24). The emergence of a separate channel of climate funds seems unlikely in the fiscal precarity induced by Covid-19.

The federal government has also tried to play a catalytic role by setting policy frameworks in the mitigation arena. It has established clear expectations of a speedy transition by setting ambitious national renewable targets and urging state regulators to force a rapid shift in distribution utility purchase decisions. This approach has, however, revealed institutional tensions. Most state regulators have notified purchase obligations well below suggested trajectories, and financially distressed distribution utilities have remained largely uncompliant (Vembadi et al. 2018). The Centre, in response, suggested an amendment to the framework *Electricity Act 2003* that allowed the Centre to mandate rather than suggest purchase obligation trajectories in the states while increasing penalties for non-compliance.

The Centre's agenda-setting role extends to other important areas as well. In the electric vehicle (EV) domain, it established a subsidy scheme for the manufacture of EVs and has signalled ambitious national targets (Arora 2018), thus stimulating recent policy activity in several states. The Centre was also the first mover with regard to energy efficiency, establishing national institutions and paving the way for the creation of a decentralized network of Energy Service Companies – though the efficacy of this model has been questioned (Harrison and Kostka 2018).

#### 9.4.2.2 *The Centre's Influence on Capacity*

The Centre also occasionally attempts to address deficiencies in state-level bureaucratic capacity. The challenge is particularly acute in the complex and evolving area of climate policymaking. A longstanding technical advisor to state governments on climate matters notes that state governments have failed to spend monies channelled through the NSCCC mainly because they are unable to conceptualize and execute large climate projects.<sup>11</sup>

Signals from the central government play a role in mobilizing state bureaucrats. Bhardwaj and Khosla (2021) show that performance in delivering high-profile climate-related CSSs come with perks in the form of promotions, monetary

rewards, and prestige. The structure of Indian state bureaucracies, led by Indian Administrative Service (IAS) officers eager to make the leap to Delhi, encourages ‘allegiance to the bureaucratic hierarchy at the Centre’ and pushes the IAS cream to prioritize central schemes in their interaction with subordinate state bureaucrats (Aiyar and Kapur 2019, 210). The Centre’s agenda-setting role cannot, however, compensate for a glaring lack of capacity at lower levels. Dasgupta and Kapur (2017) surveyed India’s Block Development Offices, an important village-level unit of governance, to find 42 per cent of posts vacant. The localized nature of the climate challenge will likely amplify capacity deficits faced by precariously poised local bureaucrats.

To address some of these challenges, the central government occasionally funnels expertise to the states. For example, the central government convened technical advisors such as UNDP, the UK’s Department for International Development, and Germany’s GIZ after the SAPCCs were announced, asking these organizations to assist states in plan development.<sup>12</sup> These organizations employed consultants and civil society organizations in what amounted to a short-term fix to the capacity constraint (Dubash and Jogesh 2014). This is not a one-off, with state governments receiving assistance for ongoing SAPCC revisions as well.<sup>13</sup>

Taken together, the federal contribution to climate federalism is notionally catalytic. It works through the gradual layering of climate-linkages into state financial flows, the stimulation of planning activity, the creation of soft bureaucratic incentives, and by funnelling technical capacity to the states at key moments. In the next section, we turn to how states respond to these federal moves.

### *9.4.3 Political Translation in the States*

Some state leaders have managed to elevate the profile of climate-related developmental activities by making a political case for them, thus overcoming low levels of electoral concern about climate change. We use broad-brush examples in this section to show that this process has occurred in a diversity of states, from rich, urban ones like Kerala to poorer agricultural states like Bihar, and across a variety of themes, from air pollution to flooding. This translation process sometimes leads to policy innovations that diffuse vertically to become the standard for national action, giving some credence to the idea of Indian states as laboratories in climate policymaking.

#### *9.4.3.1 Experiments with Co-benefits*

Climate change only found mention in the election manifestos of major national parties for the first time in the general election of 2019. In the ruling party’s

manifesto, it comprised 116 words of 18,327 (0.6 per cent) and was confined to a section on infrastructure. The subject was given only slightly more attention in the principal opposition party's manifesto, occupying 4.6 per cent across multiple sections (Dolsak and Prakash 2019). Parliament has seen little substantive discussion on the issue over the last decade (Dubash 2019).

Operating within the logic of co-benefits, however, states have managed to bridge this political gap well enough to build a noticeable body of climate policy. Alongside the thirty-two adaptation-focused climate action plans mandated by the federal government, states have established at least fifteen solar policies, ten energy conservation building codes, and twenty electric vehicle policies, apart from several LED-village lighting campaigns, energy-efficiency programmes, and afforestation initiatives (Karkun 2021; Kaur and Singh 2019). State policy profiles vary, but leaders exhibit a common inclination towards energy efficiency schemes, which is probably a reflection of high energy prices.

North India's air pollution problem is illustrative of how policies can gain from local political concerns. Air pollution is a complex federal environmental issue because it affects a large swathe of the country's north, including the national capital, and is partially caused by the burning of paddy stubble in the predominantly agricultural states of Punjab and Haryana (Jalan and Dholakia 2019; Sharma and Dikshit 2016). After elevating the issue's profile in campaigning for Delhi's 2020 elections (Sharan 2019), its chief minister unveiled an electric vehicle policy whose primary objective is bringing down pollution (Government of Delhi 2020). The policy contained generous consumer subsidies for Delhi's large urban population and is mostly funded by an 'Air Ambience Fund' built on longstanding diesel taxes. The chief minister's remarks at the launch also positioned the policy as a salve to economic damage caused by Covid-19 lockdowns and laid claim to Delhi's global leadership on the issue.

In nearby Punjab, the state government positioned its response to stubble burning as climate salient as early as 2015 by making a successful proposal to the NSCCC for a technology development programme for the 'gainful utilization' of paddy straw (MEFCC 2017), among a slew of other incentive-based measures (Chaba 2020; Harish and Ghosh 2020) that refrain from exacting costs on the crucial farmer vote bloc. Speaking at a recent national forum, a senior government official from Punjab described these actions as part of a 'climate smart' agricultural strategy (Shekar 2020).

Some state leaders have gone so far as to turn to climate messaging at crucial political moments. In 2018, after the worst floods in Kerala since 1924, the government released a sprawling plan to 'build back better' using climate-first principles. It proposed a major overhaul of infrastructure, institutional coordination, and policies across most areas of governance in service of a 'new Kerala'

(Government of Kerala 2020, 11). The political moment at which this plan emerged gives it a different tenor than previous attempts at climate planning; it came at a crucial and unsteady period in a first-time chief minister's tenure (Padmanabhan 2018). Similarly, the chief minister of Bihar, an agricultural state that experiences frequent and damaging floods, made the unprecedented move of highlighting climate change in his 2020 campaign. This involved a widely covered four-day tour of the state that highlighted new policy measures in water management and agriculture apart from participation in a climate roundtable hosted by the UN Secretary General – which is unusual for an Indian chief minister (Mishra 2019; Press Trust of India 2020).

#### 9.4.3.2 *Vertical Diffusion and Institutional Innovation*

Such efforts occasionally result in policy innovations that attain national salience. An emblematic recent example is a scheme for solar-powered agricultural pumps in the southern state of Maharashtra. Its ambition of connecting many of its farms to large solar plants could relieve distribution utilities of the burden of supplying subsidized electricity for irrigation (Maharashtra State Electricity Distribution Company Limited 2019). The idea has been eagerly embraced by the central government through a national programme that subsidizes 10 GW of decentralized solar plants (MNRE 2019).

The reasons for Maharashtra's leadership lie in the political economy of its energy development. It has lacked sufficient capacity to meet the demands of its rapidly growing base of small and medium industries in the 1990s, prompting it to implement pioneering wind energy policy (Chaudhary et al. 2014). Maharashtra also established the first clean energy fund in the country (2006), investing in infrastructure and renewable projects through a small tax on commercial and industrial electricity consumers. This was a precursor to the National Clean Energy and Environment Fund, which redirected coal taxes to clean energy projects (Chitnis et al. 2017).

Maharashtra has also established important regulatory precedents. In the months after the restructuring of the Indian electricity sector in 2003, the state electricity regulator put out a 'seminal' order for feed-in-tariffs that was later adopted by the national electricity regulator (Chaudhary et al. 2014, 19). The Maharashtra regulator also established the first Renewable Purchase Standard in the country, an idea subsequently picked up in the National Electricity Policy (2005) and now the primary driver of the renewables transition.

Some states are experimenting with new institutional arrangements, which could constitute an important frontier in experimentation. Climate bodies have emerged in Gujarat, Odisha, Tamil Nadu, and Maharashtra, for example. They are meant to coordinate between state departments and, in some cases, with the central

government (Government of Gujarat 2018; Government of Odisha n.d.; Rawal 2021; Sivakumar 2021). The Rebuild Kerala Development Programme, mentioned earlier, is coordinated by a Secretariat (Government of Kerala 2020). Tamil Nadu has established a registered state company to raise funds and implement programmes. The effectiveness of these bodies is, however, unknown.

## 9.5 Conclusion

The top-heavy nature of Indian federalism sits uneasily with the nature of the climate problem in a large country where consequences of climate change and energy transitions are felt by constituent units foremost. This dissonance between centralized federal institutions and the nature of the climate problem enmeshes the Centre and states in a multi-faceted cooperative relationship, one perhaps more intense than in classical versions of federalism seen elsewhere in this volume.

The modern institutional bias towards the Centre arises from a historical skew in power and resources to the federal government, deliberately crafted in the tumult after Indian independence and just as the global conversation on federalism became more accepting of federal dominance in economic and social policy. Since climate governance is nearly all-encompassing in the scope of actions it demands, the Centre must allocate financial and intellectual resources to stimulate and occasionally supplement action in nearly every area of state jurisdiction. Yet the nature of this top-down force is deeply conditioned by the central government's foreign policy. The government of India has worked assiduously to resist the constriction of its developmental space by international climate change pressures.

The ideas that underlie the federal government's approach to climate change – of necessarily seeking co-benefits to mitigation action and adhering to the principle of common but differentiated responsibilities – filter through to the states and thus establish the normative boundaries for appropriate climate action. This was particularly evident when the SAPCCs were first conceived, and instructions passed down to the states; state governments moulded their actions to a national template and refrained from emphasizing mitigation.

Within this framework, however, state governments have demonstrated a willingness to build political narratives around climate vulnerability at crucial political junctures – as with Kerala and Bihar – which is a precondition to climate policy experimentation. Maharashtra has led in mitigation policy and created a template for several national policies. States, in furtherance of their own developmental and political goals, gently push the boundaries of climate action.

The configuration undoubtedly presents risks. The first of these is inadequate fiscal devolution from the Centre. States have complained vocally that they have not been receiving their fair share in recent years as economic growth has slowed.

A second threat arises from the possibility of a central government that fails to incorporate climate change policy in its programmes and fiscal transfers. The Centre's normative and fiscal power places an upper limit on the depth and pace of state policy. Cumulatively, this configuration could have a chilling effect on state action and rob the multi-level governance system of its promise.

The risks are no less vexing with the states. Large variations in state capacity will become more evident as the impact of climate change grows and calls for drastic mitigation increase. Climate change also threatens to make the equalizing role of the Centre more complex by exacerbating regional inequities. A second state-based threat comes from the absence of a disciplining force from below; climate change's low political salience threatens to result in a patchwork of disconnected and possibly discordant climate initiatives.

This system will face challenges in an era of ambitious, and harder to achieve, carbon targets like net-zero. India's system of cooperation, episodic rebalancing of resources, and bursts of climate policymaking will have to yield to a more predictable, consensual model of action. Moves away from the co-benefits approach will require a new federal compact where states have access to institutions for collective decision making on targets, pace, resources, and policy. Unlike both the USA and Germany, the two countries at opposite ends of our notional spectrum, the voices of Indian states are muted in the upper house of Parliament. It will also demand new ideas about burden-sharing and equity, and, on the flip side, the Centre's punitive powers to punish free-riders. And not least, it places a much greater focus on the alchemical powers of the states, who will be forced to weave the climate crisis into areas of governance always consumed by other priorities.

### Notes

- 1 2017 constant international dollars.
- 2 Cooling and industrial gasses with global warming potentials much higher than CO<sub>2</sub>.
- 3 Electricity Act, 36 of 2003 (2003).
- 4 India has three tiers of government. The Union, or federal, government is led by the prime minister and a cabinet of ministers who run over fifty ministries. Laws are made by a bicameral Parliament with an indirectly elected upper house (a council of states). Schedule VII of the Constitution divides legislative powers between the Union and state governments through three lists: the first demarcating the jurisdiction of the Centre, the second of the states, and the third establishing a concurrent list where the Centre and states share authority. State governments therefore enjoy sole legislative power in some areas. States are led by a chief minister and a cabinet who are part of a unicameral or bicameral legislature. The third tier of elected local government is composed of three nested layers from the district to village levels, and a separate system for cities. Climate governance responsibilities are dispersed across these three levels, from Centre to village, with a crucial role played by over a quarter-million village level governments responsible for grass-roots service delivery and key aspects of resilience and disaster preparedness.
- 5 Environment (Protection) Act, 29 of 1986 (1986).
- 6 Electricity Act, 36 of 2003 (2003); Electricity (Supply) Act, 54 of 1948 (1948).

- 7 In keeping with the co-benefits paradigm, these are policies and programmes with developmental objectives whose emission savings have been quantified rather than policies with up-front emission reduction goals. They range from the National Solar Mission and Energy Efficient Buildings Programme to programmes on micro-irrigation, avoiding crop residue burning and improving the efficiency of streetlights.
- 8 Funds for NSCCC approved projects are sourced from the National Adaptation Fund for Climate Change implemented through a bank under central government jurisdiction, the National Bank for Agriculture and Rural Development. The size of the fund from 2015 to 2017 was INR 350 crore (approximately USD 47m at 2020 rates) (Parliamentary Committee on Estimates, 2018).
- 9 Data for this analysis were sourced from Bridge to India's repository of solar capacity auction results. Available at: <https://india-re-navigator.com/utility/tender-tracker>.
- 10 Rashmi, R. R. Former Special Secretary, Indian Ministry of Environment Forests and Climate Change. (5 November 2019). Personal interview.; Ramesh, J. Former environment minister. (4 May 2020). Personal interview.
- 11 Chaturvedi, A. Director – Climate Change, GIZ India (28 January 2020). Personal interview.
- 12 Chaturvedi, A. op. cit.; Mitra, S. Senior Climate and Environment Advisor (5 February 2020). Personal Interview.; Soni, P. Chief – Climate Change, Resilience and Energy (23 January 2020). Personal Interview.
- 13 Chaturvedi, A. op. cit.

## References

- Aiyar, Yamini, and Avani Kapur. 2019. 'The Centralization vs. Decentralization Tug of War and the Emerging Narrative of Fiscal Federalism for Social Policy in India'. *Regional & Federal Studies* 29 (2), 187–217. doi: 10.1080/13597566.2018.1511978.
- Aiyar, Yamini, and Louise Tillin. 2020. "'One Nation", BJP, and the Future of Indian Federalism'. *India Review* 19 (2), 117–35. doi: 10.1080/14736489.2020.1744994.
- Arora, Bhanvi. 2018. 'India Says Never Targeted 100% Electric Mobility By 2030, Scales Down Aim'. *Bloomberg Quint*, 8 March. [www.bloomberquint.com/business/india-says-never-targeted-100-electric-mobility-by-2030-scales-down-aim](http://www.bloomberquint.com/business/india-says-never-targeted-100-electric-mobility-by-2030-scales-down-aim).
- Arora, Balveer, and Nidhi Srivastava. 2019. 'Green Federalism'. *Seminar* 717. [www.india-seminar.com/2019/717/717\\_balveer\\_and\\_nidhi.htm](http://www.india-seminar.com/2019/717/717_balveer_and_nidhi.htm).
- Atal, Vinit, Gireesh Shrimali, and Vaibhav Pratap Singh. 2018. *Addressing Off-Taker Risk in Renewable Projects in India: A framework for designing a payment security mechanism as a credit enhancement device* [Technical Paper]. Climate Policy Initiative, 8 May. [www.climatepolicyinitiative.org/wp-content/uploads/2018/05/A-Framework-for-Designing-a-Payment-Security-Mechanism-as-a-Credit-Enhancement-Device-4.pdf](http://www.climatepolicyinitiative.org/wp-content/uploads/2018/05/A-Framework-for-Designing-a-Payment-Security-Mechanism-as-a-Credit-Enhancement-Device-4.pdf).
- Bhardwaj, Ankit, and Radhika Khosla. 2021. 'Superimposition: How Indian city bureaucracies are responding to climate change'. *Environment and Planning E: Nature and Space* 4 (3), 1139–70. doi: 10.1177/2514848620949096.
- Chaba, Anju Agnihotri. 2020. 'Explained: Why Punjab rent waiver on farm machines will not help much'. *Indian Express*, 10 October. <https://indianexpress.com/article/explained/punjab-farmers-stubble-burning-machines-on-rent-6717113>.
- Chakrabarti, P. G. Dhar. 2015. 'Federalism and Environmental Policy in India'. In *Green Federalism: Experiences and practices*, eds. P. G. Dhar Chakrabarti and Nidhi Srivastava, 61–71. New Delhi: The Energy and Resources Institute.
- Chakrabarti, P. G. Dhar, and Nidhi Srivastava, eds. 2015. *Green Federalism: Experiences and practices*. New Delhi: The Energy and Resources Institute.

- Chaudhary, Ankur, Ankita Narain, Chetan Krishna, and Ambuj Sagar. 2014. *Who Shapes Climate Action in India? Insights from the wind and solar energy sectors* (Evidence Report No. 56). Brighton: Institute of Development Studies. <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/3537>.
- Chitnis, Ashwini, Shripad Dharmadhikary, Shantanu Dixit, et al. 2017. *Many Sparks but Little Light: The practice and rhetoric of electricity sector reforms in India*. Prayas Energy Group. [www.prayaspune.org/peg/publications/item/332-many-sparks-but-little-light-the-rhetoric-and-practice-of-electricity-sector-reforms-in-india.html](http://www.prayaspune.org/peg/publications/item/332-many-sparks-but-little-light-the-rhetoric-and-practice-of-electricity-sector-reforms-in-india.html).
- Chokkakula, Srinivas. 2019. 'Interstate River Water Governance: Shifting the focus from conflict resolution to enabling cooperation'. In *Policy Challenges 2019–2024*, 118–21. Centre for Policy Research. <https://cprindia.org/wp-content/uploads/2022/03/Policy-Challenges-2019-2024.pdf>.
- Conceição, Pedro. 2019. *Human Development Report 2019: Beyond income, beyond averages, beyond today*. New York: United Nations Development Programme. <https://hdr.undp.org/en/content/human-development-report-2019>.
- Dasgupta, Aditya, and Devesh Kapur. 2017. 'The Political Economy of Bureaucratic Overload: Evidence from Rural Development Officials in India'. *SSRN*. doi: 10.2139/ssrn.3057602.
- Dasgupta, Chandrashekhar. 2019. 'Present at the Creation: The making of the framework convention on climate change'. In *India in a Warming World: Integrating climate change and development*, ed. Navroz K. Dubash, 142–56. New Delhi: Oxford University Press. doi: 10.1093/oso/9780199498734.001.0001.
- Dolsak, Nives, and Aseem Prakash. 2019. 'Are India's Political Parties Ignoring Climate Change?' *Forbes*, 13 April. [www.forbes.com/sites/prakashdolsak/2019/04/13/are-indias-political-parties-ignoring-climate-change](http://www.forbes.com/sites/prakashdolsak/2019/04/13/are-indias-political-parties-ignoring-climate-change).
- Dubash, Navroz K. 2013. 'The Politics of Climate Change in India: Narratives of equity and cobenefits'. *Wiley Interdisciplinary Reviews: Climate Change* 4 (3), 191–201. doi: 10.1002/wcc.210.
- Dubash, Navroz K. 2019. 'An Introduction to India's Evolving Climate Change Debate: From diplomatic insulation to policy integration'. In *India in a Warming World: Integrating climate change and development*, ed. Navroz K. Dubash, 2–28. New Delhi: Oxford University Press. doi: 10.1093/oso/9780199498734.001.0001.
- Dubash, Navroz K., and Anu Jogesh. 2014. 'From Margins to Mainstream? State Climate Planning in India as a "Door Opener" to a Sustainable Future'. *Centre for Policy Research*, 18 February. <https://cprindia.org/briefsreports/from-margins-to-mainstream-state-climate-change-planning-in-india-as-a-door-opener-to-a-sustainable-future>.
- Dubash, Navroz K., Radhika Khosla, Ulka Kelkar, and Sharachandra Lele. 2018. 'India and Climate Change: Evolving ideas and increasing policy engagement'. *Annual Review of Environment and Resources* 43 (1), 395–424. doi: 10.1146/annurev-environ-102017-025809.
- Dubash, Navroz K., and Sudhir Chella Rajan. 2001. 'Power Politics: Process of power sector reform in India'. *Economic and Political Weekly* 36 (35), 3367–87, 3389–90. <https://www.jstor.org/stable/4411059>.
- Finance Commission of India. n.d. *Finance Commissions: A Historical Perspective*. <https://fincomindia.nic.in/ShowContent.aspx?uid1=2&uid2=1&uid3=0&uid4=0>, last accessed 30 June 2021.
- Forum of Regulators. 2005. *Minutes of the First Meeting of the Forum of Regulators*. [www.forumofregulators.gov.in/Meetings.aspx](http://www.forumofregulators.gov.in/Meetings.aspx).
- Ghosh, Shibani. 2019. *Indian Environmental Law: Key concepts and principles*. Hyderabad: Orient Black Swan. <https://orientblackswan.com/details?id=9789352875795>.

- Global Carbon Project. 2019. *Global Carbon Budget 2019: Summary Highlights*. [www.globalcarbonproject.org/carbonbudget/19/highlights.htm](http://www.globalcarbonproject.org/carbonbudget/19/highlights.htm).
- Government of Delhi. 2020. *Delhi Electric Vehicles Policy, 2020*. [https://transport.delhi.gov.in/sites/default/files/All-PDF/Delhi\\_Electric\\_Vehicles\\_Policy\\_2020.pdf](https://transport.delhi.gov.in/sites/default/files/All-PDF/Delhi_Electric_Vehicles_Policy_2020.pdf).
- Government of Gujarat. 2018. *Overview*. Climate Change Department. <https://ccd.gujarat.gov.in/overview.htm>.
- Government of India. 2018. *India: Second biennial update report to the United Nations framework convention on climate change*. Ministry of Environment, Forest and Climate Change. [http://folk.uio.no/roberan/ind/india\\_proj201709.shtml](http://folk.uio.no/roberan/ind/india_proj201709.shtml).
- Government of India. 2021. *India: Third biennial update report to the United Nations framework convention on climate change*. Ministry of Environment, Forest and Climate Change. [http://folk.uio.no/roberan/ind/india\\_proj201709.shtml](http://folk.uio.no/roberan/ind/india_proj201709.shtml).
- Government of India. 2022. *India's Updated First Nationally Determined Contribution Under Paris Agreement (2021–2030)*. <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>.
- Government of Kerala. 2020. *Rebuild Kerala Development Programme*. [https://rebuild.kerala.gov.in/reports/RKDP\\_Master%2021May2019.pdf](https://rebuild.kerala.gov.in/reports/RKDP_Master%2021May2019.pdf).
- Government of Odisha. n.d. *Aims and Objectives*. Climate Change Cell, Odisha. <http://climatechangecellodisha.org>, last accessed 4 November 2020.
- Harish, S., and S. Ghosh. 2020. *Pursuing a Clean Air Agenda in India During the COVID Crisis*. Centre for Policy Research. [www.cprindia.org/research/reports/pursuing-clean-air-agenda-india-during-covid-crisis](http://www.cprindia.org/research/reports/pursuing-clean-air-agenda-india-during-covid-crisis).
- Harrison, T., and G. Kostka. 2018. 'Bureaucratic Manoeuvres and the Local Politics of Climate Change Mitigation in China and India'. *Development Policy Review*. <https://doi.org/10.1111/dpr.12386>.
- Hoegh-Guldberg, Ove, Daniela Jacob, Michael Taylor, et al. 2018. 'Impacts of 1.5°C Global Warming on Natural and Human Systems'. In *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*, eds. V. Masson-Delmotte, P. Zhai, H.-O. Pörtner, et al., 175–312. Intergovernmental Panel on Climate Change. [www.ipcc.ch/sr15](http://www.ipcc.ch/sr15).
- Huang, Jing, and Shreekanth Gupta, eds. 2014. *Environmental Policies in Asia: Perspectives from seven Asian countries*. Singapore: World Scientific. doi: 10.1142/9109.
- Hueglin, T. O., and A. Fenna. 2015. *Comparative Federalism: A systematic inquiry*, 2nd ed. Toronto: University of Toronto Press.
- India Re Navigator. 2020. *Utility Scale Solar Tenders*. Bridge to India. <https://india-re-navigator.com/utility/tender-tracker>.
- Jalan, Ishita, and Hem H. Dholakia. 2019. *What is Polluting Delhi's Air? Understanding uncertainties in emissions inventories*. New Delhi: Council on Energy, Environment and Water. [www.ceew.in/publications/what-is-polluting-delhi-air](http://www.ceew.in/publications/what-is-polluting-delhi-air).
- Jørgensen, Kirsten, Arabinda Mishra, and Gopal K. Sarangi. 2015. 'Multi-level Climate Governance in India: The role of the states in climate action planning and renewable energies'. *Journal of Integrative Environmental Sciences* 12 (4), 267–83. doi: 10.1080/1943815X.2015.1093507.
- Karkun, Arunesh. 2021. *Can EVs Solve India's Air Pollution Crisis?* New Delhi: Centre for Policy Research, Environmental Policy. <https://environmentality.cprindia.org/blog/can-evs-solve-the-air-pollution-crisis>.

- Kaur, Nehmat, and Jarnail Singh. 2019. *Driving Climate Action: State Leadership in India*. The Climate Group, 17 May. [www.indiaenvironmentportal.org.in/files/file/india\\_report.pdf](http://www.indiaenvironmentportal.org.in/files/file/india_report.pdf).
- Krishnan, R., J. Sanjay, and Chellappan Gnanaseelan, eds. 2020. *Assessment of Climate Change over the Indian Region: A report of the Ministry of Earth Sciences (MoES), Government of India*. Singapore: Springer Open. doi: 10.1007/978-981-15-4327-2.
- Kumar, Vineet. 2018. *Coping with Climate Change: An analysis of India's state action plans on climate change*. New Delhi: Centre for Science and Environment.
- Maharashtra State Electricity Distribution Company Limited. 2019. *Mukhyamantri Saur Krushi Pump Yojana*. Mahavitaran. <https://www.mahadiscom.in/solar/index.html>.
- MEFCC (Ministry of Environment, Forests and Climate Change, Govt. of India). 2014. *Guidelines for Funding State Action Plan on Climate Change (SAPCC) under Climate Change Action Program (CCAP)*. <https://dste.py.gov.in/sites/default/files/guidelinesforfundingsapcc.pdf>.
- MEFCC. 2017. *Right to Information Request MOENF/R/2017/51130/1*.
- Ministry of Finance, Govt. of India. 2020. *Central Sector Schemes*. [www.indiabudget.gov.in/expenditure\\_profile.php](http://www.indiabudget.gov.in/expenditure_profile.php).
- Ministry of Power, Govt. of India. 2018. *Minutes of the Conference of Power and NRE Minister's of States/UTs held on 3rd July, 2018 at Shimla, Himachal Pradesh*. [https://powermin.nic.in/sites/default/files/webform/notices/Final\\_approved\\_minutes.pdf](https://powermin.nic.in/sites/default/files/webform/notices/Final_approved_minutes.pdf).
- Mishra, D. 2019. 'What's Climate Change Got to Do with Bihar politics'. *The Print*, 4 December. <https://theprint.in/politics/whats-climate-change-got-to-do-with-bihar-politics-nitish-kumar-to-explain-on-his-yatra/330049>.
- MNRE (Ministry of New and Renewable Energy, Govt. of India). 2019. *Guidelines for Implementation of Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) Scheme*.
- Mueller, S., and A. Fenna. 2022. 'Dual Versus Administrative Federalism: Origins and evolution of two models'. *Publius: The Journal of Federalism* 52 (4): 525–52. <https://doi.org/10.1093/publius/pjac008>.
- Padmanabhan, A. 2018. 'Can Kerala Floods be a Defining Moment for Pinarayi Vijayan?' *Mint*, 27 August. [www.livemint.com/Opinion/3LRdCB1wkZSIC21e2uVfBP/Can-Kerala-floods-be-a-defining-moment-for-Pinarayi-Vijayan.html](http://www.livemint.com/Opinion/3LRdCB1wkZSIC21e2uVfBP/Can-Kerala-floods-be-a-defining-moment-for-Pinarayi-Vijayan.html).
- Parikh, S., and B. R. Weingast. 1997. 'Comparative Theory of Federalism: India'. *Virginia Law Review* 83, 1593.
- Parliamentary Committee on Estimates. 2018. *Performance of the National Action Plan on Climate Change* (No. 30).
- Pillai, A. V., and N. K. Dubash. 2021. 'The Limits of Opportunism: The uneven emergence of climate institutions in India'. *Environmental Politics* 30 (sup1), 93–117. doi: 10.1080/09644016.2021.1933800.
- Press Trust of India. 2020. 'Nitish Kumar Shares Bihar's Sustainable Development Efforts at UN Climate Meet'. *NDTV.Com*, September. [www.ndtv.com/india-news/nitish-kumar-shares-bihars-sustainable-development-efforts-at-un-climate-meet-2300781](http://www.ndtv.com/india-news/nitish-kumar-shares-bihars-sustainable-development-efforts-at-un-climate-meet-2300781).
- Ramesh, J. 2017. *Indira Gandhi: A life in nature*. Noida: Simon & Schuster India.
- Rao, M. G., and N. Singh. 2004. *Asymmetric Federalism in India (UC Santa Cruz International Economics Working Paper No. 04-08)*. doi: 10.2139/ssrn.537782.
- Rawal, S. 2021. 'Maharashtra Forms Council for Climate Change to Prepare Action Plan'. *Hindustan Times*, 2 September. [www.hindustantimes.com/cities/mumbai-news/maharashtra-forms-council-for-climate-change-to-prepare-action-plan-101630528745993.html](http://www.hindustantimes.com/cities/mumbai-news/maharashtra-forms-council-for-climate-change-to-prepare-action-plan-101630528745993.html).

- Sáez, L. 2002. *Federalism without a Center: The impact of political and economic reform on India's federal system*. Thousand Oaks, CA: Sage Publications.
- Sarkaria, R. S., B. Sivaraman, and S. R. Sen. 1988. *Report of the Sarkaria Commission*. New Delhi: Ministry of Home Affairs.
- Sengupta, S. 2013. 'Defending "Differentiation": India's foreign policy on climate change from Rio to Copenhagen'. In *India's Foreign Policy: A reader*, 1st ed., eds. Kanti P. Bajpai, and Harsh V. Pant. New Delhi: Oxford University Press.
- Sharan, D. 2019. 'Kejriwal Claims Pollution in Delhi Down 25% in Four Years'. *Mint*, September. [www.livemint.com/politics/news/kejriwal-claims-pollution-in-delhi-down-25-in-four-years-1567760284899.html](http://www.livemint.com/politics/news/kejriwal-claims-pollution-in-delhi-down-25-in-four-years-1567760284899.html).
- Sharma, M., and O. Dikshit. 2016. *Comprehensive Study on Air Pollution and Green House Gases (GHGs) in Delhi*. Kanpur: Indian Institute of Technology Kanpur.
- Shekar, A. 2020. *Punjab: Climate smart agriculture/air pollution*. The Climate Group - State Climate Leadership Forum, Webinar, 24 September.
- Sivakumar, B. 2021. 'TN Govt Forms Green Climate Company to Conserve Forests and Wetlands'. *The Federal*, 6 November. <https://thefederal.com/states/south/tamil-nadu/tn-govt-forms-green-climate-company-to-serve-forests-and-wetlands>.
- Subramaniam, A., and U. Kumar. 2012. 'Growth in India's States in the First Decade of the 21st Century: Four facts'. *Economic and Political Weekly* 47 (3), 7–8.
- Tillin, L. 2019. *Indian Federalism*. New Delhi: Oxford University Press India.
- Vembadi, Shiv, Nikita Das, and Ashwin Gambhir. 2018. *175 GW Renewables by 2022: A September 2018 update*. Prayas Energy Group. <https://prayaspune.org/peg/publications/item/405-175-gw-renewables-by-2022-a-september-2018-update.html>.
- Wheare, K. C. 1964. *Federal Government*, 4th ed. New York: Oxford University Press.
- World Bank. 2020. *GDP per capita, PPP (constant 2017 international \$)—India*. <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD?locations=IN>.
- XIV Finance Commission. 2013. *Report of the 14th Finance Commission*. XIV Finance Commission. <https://fincomindia.nic.in/ShowContent.aspx?uid1=3&uid2=0&uid3=0&uid4=0>.
- XV Finance Commission. 2019. *Report for the Year 2020–21*. XV Finance Commission.
- XV Finance Commission. 2020. *Finance Commission in Covid Times: Report for 2021–26*. XIV Finance Commission. [http://finance.cg.gov.in/15%20Finance%20Commission/Report/XVFC-Complete\\_Report-E.pdf](http://finance.cg.gov.in/15%20Finance%20Commission/Report/XVFC-Complete_Report-E.pdf).