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Multi-level climate governance in India: the role of the states in climate action planning and renewable energies

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ABSTRACT

This article sheds light on multi-level climate governance in the particular context of India and scrutinizes the role India's subnational states play in climate policy. It uses an analytical lens that combines multi-level climate governance and "laboratories of experimentation". The first part of the article clarifies the analytical concept of the article and deals with the phenomenon of states experimentation in multi-level climate governance structures from a theoretical background. The second part of the article explores India's multi-level climate governance structure and sheds light on the role of India's states therein with specific emphasis on the development of renewable energy. The third part looks at the multi-tiered climate action planning processes, and considers how central top-down policies and subnational bottom-up approaches are linked. Asking whether the Indian states do not only act as mere implementers of federal top-down policies, but instead create own initiatives for climate action. The article examines state climate action plans with particular focus on renewable energy initiatives integrated in the plans by asking whether the Indian states do not act solely as mere implementers of federal top-down policies, but instead create their own initiatives for climate action, much like the German Bundesländer, for example. Based on document analysis and interviews the article explores whether India's states experiment with individual approaches to develop renewable energy which are, tailored to regional specifics, or whether they mainly implement national objectives.

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1. Introduction

The goal of this paper is to shed light on multi-level climate governance in the particular context of India and to contribute to international comparative subnational climate policy research. The article examines the role India's subnational states play in climate policy. Thus far, the newly emerging literature about climate policy in India laid a strong focus on the national level (Atteridge et al. 2012; Dubash 2012; Michaelowa & Michaelowa 2012; Dubash 2013). This is due to the fact that India has a strongly centralized federal system

and a traditionally dominant decisive role of the national government. However, in recent years literature points to the importance of the subnational states in the formulation and implementation of own climate policies as well (Atteridge et al. 2012; Jörgensen 2012a; Dubash & Jogesh 2014).

International comparative subnational climate research gives evidence of the pivotal role subnational states play in climate policy-making and implementation (see editorial for this special issue). Surprisingly enough, impressive progress has been made at the subnational state level in a large number of best practice cases “across different federal or multilevel governance systems” (Rabe 2008, p. 106). The analytical concepts used for the exploration of multi-level climate governance in India are drawn from the international comparative subnational climate research literature. The role of India’s states is examined through an analytical lens that combines multi-level climate governance and laboratories of experimentation.

The first part of the article clarifies the analytical concept of the article and deals with the phenomenon of states experimentation in multi-level climate governance structures from a theoretical background. The second part of the article explores India’s multi-level climate governance structure and sheds light on the role of India’s states therein with specific emphasis on the development of renewable energy. The promotion of renewable energy was chosen as the primary focus of analysis as it is considered as an important climate mitigation instrument with larger economic and social co-benefits (IPCC 2011; REN21 2013).

The third part looks at the multi-tiered climate action planning processes, and considers how central top-down policies and subnational bottom-up approaches are intertwined. Asking whether the Indian states do not only act as mere implementers of federal top-down policies, the article examines state climate action plans with particular focus on renewable energy initiatives integrated in these plans. The methodological approach as described at page 13 consists of a document analysis and interviews exploring whether, India’s states experiment with individual approaches to develop renewable energy, which are tailored to regional specifics, or whether they mainly implement national objectives.

2. Researching the subnational climate laboratories

Since 2000, there has been an increasing emphasis in the field of comparative intra- as well as international research on the role that subnational states play in the global multi-level climate governance system (Gupta 2007; Gupta et al. 2007; Schreurs & Epstein 2007; Rabe 2004, 2008, 2011; Engel 2006, 2009; Rabe et al. 2006; Schreurs 2008; Betsill & Rabe 2009; Happaerts et al. 2012). This academic debate is interested in a better understanding of subnational states potentials for innovation, experimentation, policy transfer as well as motives and drivers behind policy change. Subnational state policies have been found to be an important factor in climate issues and closely-related areas such as energy security. The subnational state level provides an important interface between the federal and the local level. It administers a variety of functions- executing federal regulations as well as exercising state competencies spelled out in the constitution. Subnational states can block and slow down domestic climate policy, but they can also act as innovators. The role of the states in domestic climate policy has been extensively and systematically analysed in the USA (Rabe 2004, 2008, 2011; Mazmanian et al. 2008; Engel 2009; Nelson et al. 2014), where it can draw on the notion of laboratories for experimentation (Jörgensen 2012a). In regard to multi-level

climate governance research it is interesting to note that subnational laboratories have the chance to independently develop new problem-solutions in different policy domains.

Drawing from Michael Porter's writings on competition and economic development (2000), as well as following the interstate competition approach, Rabe et al. (2006) developed an analytical framework for the research of the drivers and motives of subnational states climate policies in federal systems. They looked at the question of why single states would ignore the collective action problem involved in climate mitigation and act independently from other states and the federal level. Their analysis of the U.S. cases has shown that subnational climate policy is shaped by specific regional motives. The drivers of proactive climate change policies are linked to co-benefits of climate mitigation, the competitive assets of the states and their interest in maximizing their "economic stability and welfare" (Rabe et al. 2006, p. 43), such as energy security for example. Likewise, in the German Bundesländer co-benefits of climate mitigation have been found through energy conservation in the building and housing sector and through the promotion of renewable energy (Jørgensen 2012b).

Rabe et al. (2006) assert that climate regulation on the state level takes advantage of co-benefits and mitigation assets. States that own these assets will push and try to upload their mitigation strategies to the higher level (Rabe et al. 2006, p. 44). Their policy frameworks might become templates for national initiatives or not (Rabe 2004, 2011; Engel 2009).

In the following a brief introduction to the state and structure of India's domestic climate policy will be provided.

3. Renewable energy and climate policy in the federal system of India

Divided into 29 subnational states and 7 union territories, India is described in the academic literature as well as the political discourse as a heavily centralized quasi-federal system (Lijphart 1996, p. 259) or as a minimal federalism (Parikh & Weingast 1997) with the Union Government taking the lead. Centralized policy-making has also been confirmed for environment policy (Reich & Bowonder 1992; Jasanoff 1993; Gupta 2001).

Energy comes under concurrent legislation, hence involving both levels of government. As for climate change, India lacks clear-cut legislative responsibility. Due to the international scope of the problem, as well as the constitutional competency of the Union Government for international agreements and treaties, the main responsibility for climate change agreements lies with the Union Government. Furthermore, legislative responsibilities for climate policy derive from different legal sources. Amongst the few issue areas relevant to climate policy over which the national legislator has exclusive powers are trade representation, the United Nations Organisation, agreements and conventions with foreign countries, atomic power, mineral and oil resources and control of industries. The state governments have exclusive jurisdiction over public health and sanitation, agriculture, land improvement and water.

As for the formal institutional set up, it can be said that, despite the centre's strong legislative powers and executive rights, the subnational state level possesses a number of important legislative powers relevant to climate and energy policy. Yet it is important to note that the scope for bottom-up action should not be overestimated, since it is either limited by financial bottlenecks due dependency on financial transfers from the Centre (Parikh & Weingast 1997). The following section shall shed light on the role different levels and actors actually play in renewable energy and climate policy-making in India. The role of the Union states and the implementation structure will be considered.

3.1. Renewable energy policy

Driven by energy security concerns renewable energy policy and energy conservation have been pursued for nearly five decades in India and can be traced back to the era of the global oil crisis in the 1970s (Anumakonda 2007, p. 540; PEW 2008; IPCC 2011). The institutionalization of regulatory frameworks, incentive schemes and research was initiated as a top-down strategy by the Centre (Anumakonda 2007). The institutional structure was initially limited to the national arena. Founded in 1982, the Department for Non-Conventional Energy Resources, first becoming the Ministry of Non-conventional Energy Sources (MNES) (1992) and later the Ministry of New and Renewable Energy (MNRE) (2006) became a central actor in the promotion of India's renewable energy policy. Various other ministries and national institutions have been involved ever since. After India's economic liberalization in the 1990s, energy policy received new impetus. The renewable energy policy framework has been unfolding since then, setting goals and introducing instruments such as feed-in tariffs, banking of energy, wheeling of powers and third-party sale of power, all of them designed in the national policy arena (Chaudhary et al. 2014). During the 1980s the states were involved in demonstration projects (Chaudhary et al. 2014). Gradually, a few of India's states gained increased relevance as players in the country's renewable energy policy. National agencies began to emphasize the vertical integration of renewable energy policy and the strengthening and activating of respective states capacities. The Electricity Act 2003, which "played a pioneering role" (Schmid 2012, p. 321) specified the division of tasks between the national level and state governments and provided for a supportive framework for state action. Generation of electricity from renewable sources was to be promoted by the State Electricity Regulatory Commissions (SERCs). Subnational states policies play a central role in the implementation of India's renewable energy policy. As will be addressed below, more recently a number of states provide for their own policies and site conditions for investments in renewable energy nowadays. In particular states such as Tamil Nadu, Karnataka, Rajasthan, Maharashtra and Gujarat, which own locational advantages in the wind and the solar sector, performed very well.

Considering India's assessed renewable energy potential of 150 GW (World Bank 2010), renewable energy policies are the ones with the greatest socio-economic potential, including the increase of energy security, employment, improvements in the local environment, the development of infrastructure in rural areas, and further development of high technology industries. Of particular importance therein is the growing market for renewable energy producers in India (IPCC 2011).

3.2. Climate policy

Climate policy first emerged in India as a separate policy field after 2007. This is evidenced by the introduction of India's first National Action Plan for Climate Change (2008) and previous to that plan, the constitution of the Nation Council on Climate Change under the chairmanship of the Prime Minister. Moreover, a Parliamentary Forum on Global Warming and Climate Change was constituted with the aim of encouraging parliamentarians to interact with experts in the domain of climate change. In order to further strengthen the institutional structure, a national level network known as Indian Network for Climate Change Assessment (INCCA) was established. India's climate policy includes a range of sector-based mitigation

as well as adaptation policies and strategies (Sant & Gambhir 2012) and, most important, builds on the long established regulatory frameworks in the energy sector. Renewable energy policy can be regarded as a central element of climate policy in India, particularly in the context of climate mitigation (Anandarajah & Gambhir 2014). India's national action plan on climate change (NAPCC) addresses relevant sectors with eight "National Missions", amongst them the promotion of solar energy, enhanced energy efficiency, sustainable habitat and sustainable agriculture. The plan states national objectives such as the promotion of renewable energies ("Solar Mission") in addition to energy efficiency ("Enhanced Energy Efficiency") (GOI 2008). It deals in particular with the deployment of appropriate technology as well as new and innovative forms of governance and institutional arrangements. These include market, regulatory and voluntary mechanisms in addition to efficient as well as cost effective strategies (GOI 2008).

Since 2007, climate policy emerged, first and foremost, as a top-down approach – a strategy initiated by India's central government (Atteridge 2013). Involved in the overall climate policy and, more broadly, the governance structures are the Prime Minister, a number of federal ministries, the Union parliament, expert groups, the business sector, civil society actors, research institutes and international organizations (Das 2012; Pulver 2012; Lele 2012). Moreover, the Planning Commission and the Financial Commission were highly relevant actors with respect to formulating and choosing policy alternatives as well as their implementation. Both Commissions were used to working at the interface between the central government and the states, and were involved in the implementation of national targets at the subnational level. In India's centralized policy-making, the Planning Commission - which was replaced by the National Institution for Transforming India in winter 2014 – developed the five-year plans that established national objectives. In connection thereto, the Financial Commission is responsible for budgeting the centralised public revenues (Sáez 2002). The goal formulation as well as implementation of the National Missions, is under the aegis of the respective ministries at the national level (Mishra et al. 2011). The mainstreaming of the national climate objectives and the state-wide implementation took place in a rather hierarchically coordinated two-level policy-making structure. The authority to decide on the national goals lies predominantly with the Union government and the obligation to implement at the subnational level (Mishra et al. 2011). According to Vivekanandan (2009), the centralised policy-formulation for the eight National Missions at the Union level lacked input from lower levels. In a report on "Low Carbon Policies for Inclusive Growth", the Planning Commission stressed the importance of a multi-level governance structure (GOI, Planning Commission 2011). There are signs that India's federal states are going to play a more important role in the domestic and international climate policy of the country. In the context of the United Nations Climate Conference of the Parties 2009 in Copenhagen (COP 15), India's domestic climate policy was mainly set out by India's first NAPCC, dating from 2008. Six years later, in the run up to the COP 20 which took place in Lima (2014), 28 Indian states were reported to have prepared state action plans on climate change (SAPCC) which were conceived as an extension of the national strategy (Jogesh and Dubash) and contribution to the development of India's Intended Nationally Determined Contribution (INDC). India's states are expected to become the engines in the realization of ambitious goals for the extension of solar energy and wind capacities as part of India's national climate strategy. Recent change both in the national planning structures, in particular the removal of the Planning Commission and in India's financial federalism redistributing tax revenues in favor

of the states indicates the strengthening of elements of competitive federalism (India's one-man band 2015).

3.3. Renewable energy – the role of india's subnational state laboratories

As for the system of implementation - comparable with the federal systems of Germany and the USA – little progress could be achieved in regard to the Indian NAPCC and the renewable energy framework without the subnational state's implementation efforts. Literature on renewable energy policies in India shows that the states' performances vary. Motivated by economic and political reasons a number of Indian states comparable to US states are becoming motors of diversification in the energy sector.

As opposed to mere implementation of national policies, renewable energy policies in a number of Indian states include additional policy instruments (Anumakonda 2007; Schmid 2012; Sharma et al. 2012). Ten out of the twenty-eight Indian states (Tamil Nadu, Karnataka, Andhra Pradesh, Gujarat, Rajasthan, Maharashtra, Madhya Pradesh, West Bengal, Kerala, and Odisha) were implementing major wind energy programmes in 2009 (Rao & Kishore 2009, p. 984). Rao and Kishore (2009) found that the rates of diffusion of wind power technologies and achievements have been different for different states and correlated with policy parameters. (Rao & Kishore 2009, p. 987) Four Indian states out of the ten – Gujarat, Tamil Nadu, Maharashtra and Andhra Pradesh – account for 60% of the total potential and have 90% of the total installed wind generation capacity (Rao & Kishore 2009, p. 984). Tamil Nadu's share in India's overall installed wind power was 43.94% in 2011 (Sharma 2012, p. 1161).

A study by Schmid (2012) which examines the role of national and state level policies and instruments in nine Indian states found that state level policies, quantity based instruments, and greater participation of private players have contributed to the successful implementation of renewable energy projects. A significant state action is the formulation of outstanding goals in the context of the national and subnational Renewable Energy Purchase Obligations and feed-in tariffs (Schmid 2012; Chaudhary et al. 2014, p. 18) with the purpose of boosting renewable energy in the states (Chaudhary et al. 2014, p. 17). Renewable Purchase Specifications (RPS) have been declared in 26 states. Preferential tariffs have been prescribed in 13 out of 9 states for wind energy projects (WISE 2012). Similarly, another study highlights that CDM benefit sharing and fiscal incentives at the state level are major determinants of renewable energy projects in a state (Sawney & Rahul 2014).

Renewable energy projects alone share about 50% of CER potential of the country (GIZ 2014). Within renewable projects, while wind projects have accrued the majority of CDM benefits, followed by biomass and small hydro projects, solar projects have gained negligible benefits (Sawney & Rahul 2014). However, review of state solar policies declared in the recent past, reveals that CDM has been explicitly considered as a key financial mechanism to drive the sector.

Policy measures in the states also include preferential tariffs, wheeling and banking charges, third party sales, grid quality as well as availability of land for installations and distance from the generation point to feed-in point, Green Energy Funds and taxes. Maharashtra state action includes for instance the designation of special economic zones for wind energy farms, a single window system for the allocation of sites for wind power, and considerations for incentive packages (Sharma et al. 2012). Maharashtra's seminal order for feed-in-tariffs are regarded as best practice cases (Chaudhary et al. 2014, p. 8). Gujarat brought climate policy

on the state agenda and institutionalized a governmental climate protection department in 2009 in order to attract more renewable energy generation projects to the state. Thus competitive advantages and economic benefits drive subnational action, hence creating win-win constellations within climate policy.

4. Climate action planning in the states

The role of subnational state and local agencies in the implementation of India's national climate policy is mentioned in several chapters of the NAPCC. The first signal to the states to taking action had been sent at a conference of state ministers held on August 19th, 2009, when the former Prime Minister Manmohan Singh requested that the states devise state-level climate action plans. These were expected to follow an approach consistent with the principles underlying the NAPCC, and identify strategies aligned with the eight national "Missions".

A majority of the Indian states have already prepared their action plans on climate change and 19 of these documents are in the public domain¹ after being endorsed by the National Steering Committee on Climate Change, plus another 3 that have been considered by the Expert Committee set up by the federal ministry of environment and forests (MoEF). Jogesh and Dubash (in this Special Issue) discuss in detail the process of climate policy formulation in Indian states.

Previous studies indicate that in their climate action planning the states chose their priority sectors according to their development concerns (Mishra et al. 2011, p. 12) striving to take advantage of co-benefits. Co-benefits of climate change are an important concept in the design of India's NAPCC, which is according to assessments very useful and promising though not yet concrete enough to provide for guidance (Dubash et al. 2013). This approach is described in the NAPCC as the identification of measures promoting India's development goals while at the same time yielding "co-benefits of addressing climate change effectively" (GOI 2008, p. 5). Among the subjects singled out in state action plans were: energy efficient power generation, industrial energy efficiency and renewable energy generation. The states' plans highlights the promotion of energy efficiency and generation of green energy, which is regarded as an "important tool for spurring regional economic development" (Mishra et al. 2011, p. 15); Karnataka's Plan in particular featured elements of a political strategy (Mishra et al. 2011, p. 18).

4.1. Renewable energy in state climate action plans

In the following we will focus on the role, renewable energy plays in climate action plans of selected states. As mentioned above, renewable energy -as a clean technology- has emerged as a major response strategy in India not only to address the age-old concerns like energy security and providing access to energy, but with regard to the adoption of the NAPCC in 2008 also as a key mitigation option to counter the threats of climate change. NAPCC targets aim at procuring 15% of the total energy from renewable energy sources by 2020 (GOI 2008). Latest available statistics suggest that grid interactive renewable energy in the country moved up from 3.9 GW in 2002–03 to 31.7 GW in 2013–14, which constitutes about 12.39% of the total installed capacity (GOI 2014). More interestingly, while wind still dominates with a share of about 70%, solar is increasingly picking up. Renewable energy provides various opportunities to apply the co-benefit approach, addressing climate change mitigation and

sustainable economic development including energy access and supply, energy security and local environmental impacts simultaneously (IPCC 2011, p. 195 ff.).

In this study, a select set of state climate action plans were scrutinised and systematically examined in respect to what states are planning to do, including their envisaged objectives, and measures related to the promotion and application of renewable energy technology. The examination sheds light on technological choices as well as policies and sectors selected for renewable energy measures. In the study we examined whether the states' climate action plans indicate that renewable energy policy objectives and measures shall be combined with the generation of desired effects in other policy areas simultaneously. The sectors and policy areas, which lend themselves for consideration of the co-benefits approach are: development goals, sustainable habitat, agriculture, industry, urban development, transportation, fishery and coastal zone management. Different kinds of co-benefits envisaged by the state climate action plans could be distinguished, such as for example technological modernization, access to energy, poverty alleviation, green jobs, and control of air pollution.

Another aspect addressed in the analysis, is the interplay between India's national top-down climate policy and subnational action coming from the bottom-up. The study looks at whether the states primarily implement the federal policy framework and particularly the national missions defined in the NAPCC, or whether they have been ambitious enough to independently experiment with initiatives driven by regional context and requirements.

Finally, still with renewable energy as the focus, policy objectives and measures proposed in the state climate action plans were examined in the study addressing the question whether the scale and scope of the proposed action are either ambitious or cautiously incremental.

We confine our unit of research to 10 state climate action plans² that are available in the public domain after receiving due approval from the state and national governments. The states chosen for the study are (1) Chhattisgarh, (2) Haryana, (3) Jharkhand, (4) Karnataka, (5) Kerala, (6) Madhya Pradesh, (7) Odisha, (8) Rajasthan, (9) Tamil Nadu, and (10) West Bengal. This is a subset of the total number of approved and publicly available SAPCC documents. We have excluded states that would have acted as outliers or not been comparable because of some peculiar/unique characteristics, such as Delhi (highly urban), northeastern states (small in sizes), and Andhra Pradesh (divided into two separate states post-2013). Apart from a systematic content analysis of the select 10 SAPCCs, the study benefitted greatly from a series of stakeholders consultation workshops conducted in 5 states (Assam, Bihar, Chhattisgarh, Kerala, and Odisha) during the first half of 2014. Meetings preceded each of these workshops with high-level officials connected with the preparation and implementation of the SAPCC. Additionally, the paper draws upon the first-hand experience of the second author as a technical consultant to multiple state governments in the preparation of their climate action plans.

4.1.1. Capturing the variations: technological choices, sectors and co-benefits

Renewable energy has been given emphasis in all the studied states, though varyingly. The decomposition of technology specific focus across states reveals some interesting variations. While solar is the key renewable energy technology prioritized in all the ten study states, other technology options like waste to energy, small hydro, biomass and wind have been varyingly identified as priority areas by different subsets of the study states. While the National Solar Mission has clearly acted as a common policy driver for all states, the varying

emphasis with respect to other renewable energy resources can be linked to differing policy frameworks for non-solar resources across states, as presented in Table 1.³

Interestingly, again from Table 1, a variation could be observed in the sectors and areas identified for application of renewable energy, indicating that the states are taking advantages of co-benefits that are relevant to the regional context. The majority of the researched states climate action plans (six out of ten) lay emphasis on applying renewable energy in the farm sector with specific thrust on energizing pump sets, technical modernization of agricultural sector and energisation of cold storages. In particular, there is a lot of emphasis to replace the existing pump sets either run by diesel/kerosene fuels or by grid based systems with solar energy run pump sets. The six states following this obvious co-benefit approach – Chhattisgarh, Haryana, Karnataka, Kerala, Rajasthan and Tamil Nadu – have proposed large-scale application of renewable energy for farm irrigation. The Kerala state action plan espouses introducing various renewable energy applications for farm mechanization; moreover, the plan also declares intent of using renewable energy in the fishery sector (for

Table 1. Renewable energy in states in India: resource profile, applications and policy framework.

| State | RE resource focus in SAPCC | Specific RE application identified in SAPCC | State level RE policy framework/Policy directives |
|----------------|--|--|--|
| Chhattisgarh | Solar, wind, waste to energy | Irrigation/Energisation of pump sets; village electrification through DDG | Biogas policy 2014–15Chhattisgarh solar policy 2012Policy directives on allotments of sites and incentives to small hydel projects 2012Wind energy policy 2002 |
| Haryana | Solar, wind, biomass, small hydro, waste to energy | Irrigation/Energisation of pump sets | Policy for promoting generation of electricity through renewable energy sources 2005Haryana solar power policy 2005 |
| Jharkhand | Solar, biomass, small hydro, waste to energy | Waste to energy | Jharkhand energy policy 2012Jharkhand solar policy 2013 |
| Karnataka | Solar, wind, biomass, small hydro, waste to energy | Irrigation/Energisation of pump sets; waste to energy | Karnataka solar policy 2014–2021Karnataka renewable energy policy, 2009–2014 |
| Kerala | Solar, wind, biomass, waste to energy | Irrigation/Energisation of pump sets; waste to energy; village electrification through DDG | Kerala solar energy policy 2013Wind energy policy 2004Renewable energy policy 2002 |
| Madhya Pradesh | Solar, wind, biomass | Village electrification through DDG | Policy for promotion of solar power based projects in Madhya Pradesh 2012Wind power policy 2012 (amended in 2013)Biomass power policy 2011Small hydro power policy 2011 |
| Odisha | Solar, wind, biomass, small hydro | – | Policy guidelines on power generation from non-conventional energy sources 2005Odisha solar policy 2013 (draft) |
| Rajasthan | Solar, wind, biomass, waste to energy | Irrigation/Energisation of pump sets | Rajasthan solar energy policy 2014Policy for promoting generation of electricity through non-conventional energy sources 2004 (amended in 2008)Policy for promoting generation of electricity from wind 2012Policy for promoting generation of electricity from biomass 2010 |
| Tamil Nadu | Solar, wind, waste to energy | Irrigation/Energisation of pump sets; waste to energy; village electrification through DDG | Tamil Nadu solar energy policy 2012 |
| West Bengal | Solar, Biomass | – | Policy on co-generation and Generation of electricity from renewable sources of energy 2012Policy of government of west bengal on mini/micro hydro |

Table 2. Cross sector spread of renewable energy interventions in SAPCCs.

| State | Agriculture, forestry, fisheries and coastal area management | Industrial sector | Urban development | Transport | Energy | Tourism | Sustainable habitat |
|----------------|--|-------------------|-------------------|-----------|--------|---------|---------------------|
| Chhattisgarh | 1 | – | 3 | 2 | 6 | – | – |
| Haryana | – | – | – | – | 20 | – | – |
| Jharkhand | 3 | 2 | – | – | 6 | – | – |
| Karnataka | 2 | – | 1 | – | 2 | – | – |
| Kerala | 6 | – | 2 | – | 14 | 1 | – |
| Madhya Pradesh | 3 | 2 | – | – | 15 | – | – |
| Odisha | – | – | – | 2 | 7 | – | – |
| Tamil Nadu | 3 | – | – | – | 1 | – | 10 |
| West Bengal | 2 | 1 | 1 | – | – | – | – |

activities like fish harvesting and fish drying) and in tourism. In states such as Haryana and Kerala, application of renewable energy for energizing cold storages is also prioritized. In four of the study states (Chhattisgarh, Kerala, Madhya Pradesh and Tamil Nadu), renewable energy is seen as an important source for providing accelerated access to electricity to people excluded from grid connectivity. Emphasis is laid on generating energy from waste by conducting pilots' experiments in the SAPCCs of Jharkhand, Karnataka, Kerala, and Tamil Nadu.

The co-benefits approach is further reflected in the spread of renewable energy based interventions across sectors. It can be discerned from Table 2 that the SAPCCs identify renewable energy based policy measures as well as technology applications in non-energy sectors such as agriculture, industry, urban development, transportation, tourism and sustainable habitat. Among the identified sectors, agriculture, fisheries and coastal area management are the sectors, where the emphasis on renewable energy is relatively greater compared to other sectors. Application profile of renewable energy as revealed from the state action plans suggests that prominence is laid on creating livelihood activities through wider use of renewable energy in the farm sector.⁴

4.1.2. Implementing the federal framework vs. states independent action

Earlier, in Table 1, we presented various renewable energy policies prevailing in different states and indicated their role as drivers behind the choice of SAPCC interventions. Thus, for instance, Rajasthan's state action plan envisages aligning the activities related to the renewable energy generation to the state solar policy. The Karnataka state action plan, on the other hand, proposes amending the existing biofuel policy of the state, keeping in consideration climate change concerns. Thus climate policy formulation at the state level has also prompted the need to revise or modify existing state policies on renewable energy.

There are specific examples where the federal policy framework is prompting states to have a relook at their existing policies or introduce new policies in the interest of better implementation of nationally determined actions. The Haryana state climate action plan talks of accessing benefits from the Jawaharlal Nehru National Solar Mission and building institutional capacity in the state agencies for the same purpose. It also mentions the needed approval from the central ministry i.e. MNRE for developing renewable energy projects in the

state. In similar vein, Tamil Nadu climate action plan speaks of the need for policy formulation for the LED and solar lighting.

In the choice of policy instruments for renewable energy promotion, the SAPCCs largely draw from the federal policy framework. Odisha and Karnataka climate action plans stress on the implementation of RPOs and feed-in-tariffs for the promotion of renewable energy. Rajasthan state climate action plan speaks of extending fiscal incentives for the renewable energy development in the state. It also proposes setting up of an infrastructure development fund, which would provide necessary finance for renewable energy sector development. Karnataka state climate action plan envisages providing special incentive packages for developing renewable energy in the state. These instruments and incentives are largely driven by the policies and guidelines of the national government, hence could be termed as top-down policy implementation by states. However, states like Madhya Pradesh, Karnataka and Kerala have emphasized the role of green tariffs as an important price based measure to drive the renewable energy sector in their respective states, which can be seen as an innovative approach.

Some states have laid down independent road maps for mobilizing additional resources for the promotion of renewable energy resources. Emphasis on public-private partnership (PPP) form of management options for the promotion of renewable energy has been identified as an option to supplement the scarce budgetary resources available with the states. For instance, states like Kerala and Madhya Pradesh have proposed PPP as a management option for the promotion of renewable energy in their respective states. Such measures are context specific and their identification in SAPCCs is linked to prevailing institutional capacity in the state.

4.1.3. Incremental planning vs. ambitious experimentation

Renewable energy interventions in the states were happening prior to SAPCCs. The majority of renewable energy based activities identified in the SAPCCs are connected to on-going activities, some of which might be happening in small scales and therefore proposed for scaling up under the climate action plans. Application of renewable energy in the farm sector (such as farm irrigation through solar pump sets as envisaged in state action plans of Chhattisgarh, Haryana, Karnataka, Kerala, Rajasthan and Tamil Nadu), or for energizing cold storages (in states like Haryana and Kerala), or for fishery sector activities (in Kerala) are largely continuation of existing programs and therefore categorized as incremental in our study. Similarly, focus on renewable energy to provide access to electricity in states like Chhattisgarh, Haryana, Karnataka, Kerala, Rajasthan and Tamil Nadu, is not entirely new.

The agenda to generate awareness to accelerate the promotion of renewable energy through various means such as educating school and college students in MP, creating awareness amongst rice sellers to adopt biomass technology in Haryana, or creating general awareness among people about renewable energy applications in Kerala and Tamil Nadu is again an additional focus on the on-going activities in this domain. Similarly, capacity building initiatives identified in different state action plans in various forms such as strengthening technical capacities in Haryana or enhancing general capacity in the field of renewable energy as envisaged in Kerala are again incremental activities.

However, there does exist some evidence of more ambitious policy-making in some state action plans in the form of either creating new institutions or devising new ways of management and co-ordination. In discussions with officials of the nodal environment department

in some of the study states, it was clear that the process of preparing the SAPCC itself has been a novel experience. The cross-sector nature of actions has established the need for convergence in government programs. One approach to addressing this need is in terms of new institutional arrangements for management and coordination. Thus, for instance, the Odisha state government is proposing to establish the Odisha Climate Change Agency, which will institutionalize the coordination and knowledge management activities as a “single window contact”; such a proposal is quite innovative and likely to facilitate greater interaction among the stakeholders. Another significant initiative by the state government is establishment of the Green Energy Development Corporation of Odisha Limited (GEDCOL) to promote renewable energy development in the state through private sector participation. Similarly, Jharkhand state climate action plan proposes creating a dedicated Centre to extend technical support to the renewable energy development. One can also find evidence of proposed new ways of management and co-ordination through integration of energy planning for all new developments (e.g. in Kerala state climate action plan), functional integration of renewable energy and energy efficiency programs (e.g. in Kerala state climate action plan) and functional reorganization of existing institutions (e.g. in Odisha state climate action plan) keeping in consideration of the renewable energy development in the state.

In sum, it can be stated that majority of initiatives envisaged in the state climate action plans are of incremental in nature, barring a few initiatives which could be termed as experimental.

4.1.4. Political leadership and policy entrepreneurship from bureaucracy

There is considerable variation amongst the States in terms of the interest and initiative shown by either the political representatives or the chiefs of bureaucracy regarding the preparation and implementation of the SAPCCs. Politically the pioneering effort can be said to have come from Gujarat State which continues to be the only State in the country to have a dedicated Department of Climate Change under the charge of the Chief Minister – the highest level of political authority at the sub-national level. Similarly, in the States of Maharashtra and Sikkim there is high level political support as well as direct involvement of political representatives and executive heads in the preparation of SAPCC and the prioritization of activities under it. In Maharashtra, a State Council on Climate Change has been set up under the chairmanship of the Chief Minister and the Council has been regularly reviewing the progress of the planning of SAPCC activities.

As far as our ten study States are concerned, the Odisha SAPCC seems to have received the most political and bureaucratic support in its preparation and on-going implementation. The preparation phase saw the support to the Plan from the Chief Minister himself, and in its on-going implementation there is regular monitoring and evaluation of progress by a high-level Monitoring and Advisory Committee led by the Chief Secretary (set up in 2011). The commitment to implementing the SAPCC seems to be high with the Chief Secretary indicating that the action plan will be implemented without waiting for central assistance.

For the other study States, political support to SAPCC is weak or clearly lacking and it is individual leadership in the bureaucracy that seems to be driving forward the planning process. Such initiative by individual “champions” is particularly evident in case of Chhattisgarh and Madhya Pradesh where the State nodal officers have been playing a key role. But the need for political support is acutely felt by concerned stakeholders; as one of the state “champions” put it “the immediate real priority is sensitization of the political system”.

4.1.5. The co-option of new actors: signs of third-party governance?

Subnational climate action planning in India is witnessing a growing willingness on part of government authorities to engage with universities and technical institutes having the potential to provide technical and strategic knowledge support to public sector agencies. The impetus seems to have been provided by the INCCA, a country-wide network of over 120 knowledge institutions and over 220 scientists, which was established in 2009 by the federal MoEF to collaborate and carry out integrated assessments of climate change impacts for the country's different sectors and regions. This is a clear example of the government encouraging a coordinated approach to engaging external expertise for strategic knowledge generation in the context of climate change (Sud et al. 2015). At the subnational level, several of the SAPCCs have identified universities and technical institutes located within the states as technical resource centers and provided them with mandates for strategic knowledge generation and information management, capacity building of public officials, and even monitoring of implementation.

Interestingly, most of SAPCCs have identified "PPP" as a route to promote and develop renewable energy in their respective states. Such an approach is quite in line with the national level trend in development planning and implementation. To cite some of the examples, the Haryana SAPCC lays specific emphasis on promoting of solar cities through PPP mode. Similarly, the Karnataka SAPCC speaks of utilizing private sector investments and PPPs as effective modes of solar and wind energy development. In addition, Karnataka SAPCC also recognizes leveraging PPP in renewable energy research and domestic manufacturing of renewable energy equipment. The Madhya Pradesh SAPCC suggests using PPP in the field of biomass projects and solid waste management and various solar equipment production. The Odisha SAPPCC also gives emphasis to PPP route for development of solar energy.

5. Conclusions

Driven by economic and political motives, a large number of subnational states worldwide promote the transition to a low carbon economy by policy frameworks that stimulate renewable energy technologies and markets. The question posed in this paper was whether climate action and particularly the promotion of renewable energy in India could also be investigated successfully through a multi-level climate governance lens, focussing the states as laboratories of experimentation. A number of arguments and observations about India's emerging multi-level climate governance structures suggest that for a country of India's vast size, as well as diverse economic and political dynamics, it appears plausible that policy change will not be driven solely by the Union government in the top-down manner (Jørgensen 2012a). In regard to the institutional scope for action as concerns climate policy, India's states possess a certain degree of self-rule for taking action. They are, as yet, still constrained by lacking financial resources for taking action.

Predictably, with its strongly centralized federal system, policy initiation and formulation in both areas - renewable energy (since the 1980s) and climate change (since 2007) - occurred in a top-down manner giving the federal government a dominant role. However, since the initiation of these policy fields, the subnational states have become crucial in the implementation of the national goals, regulatory frameworks and incentive systems. Following India's economic liberalization in the 1990s, the role of a number of states in renewable energy policy shifted from pure implementation of centrally designed policies,

to more independent policy-making. Building on the national regulatory framework as well as India's Energy Act 2003, a significant variation of state policies and outcomes in the deployment of wind power and solar energy can be evidenced. States performed renewable energy policies as competition strategies; in particular, states owning locational advantages in the wind and the solar sector performed very well. Energy policy studies indicate that the rapid expansion of wind power in a number of states is related to individual programs for the promotion of renewable energies.

In the area of climate policy and planning, a political-administrative institutionalization is taking place since 2008 and a variation in subnational strategies and focal areas for mitigation and adaptation has been observed. As for the implementation of the National Action Plan Climate Change, our study of 10 state climate action plans shows that renewable energy has been given emphasis in all the studied states, though varying. The decomposition of technology specific focus across states reveals a handful of interesting variations. Interestingly, a variation could be observed in the sectors and areas identified for the application of renewable energy, indicating that the states are taking advantages of co-benefits that are relevant to the particular states' regional context as well as the economic and development assets.

The findings suggest that domestic renewable energy and climate policy in India is influenced by emerging multi-level climate governance structures giving India's states a more important role in the design of policy objectives and instruments. Similar to other subnational states and provinces worldwide, Indian states do not act solely as mere implementers of federal top-down policies, rather India's states experiment with individual approaches to develop renewable energy, tailored to regional specifics.

A strengthening of cooperation between the national level and the states appears to be important. Whether or not the states function as laboratories for experimentation cannot be answered within the scope of this study. More research is required with respect to horizontal and vertical diffusion of policies and lesson drawing across states but also involving the national level.

Notes

1. <http://envfor.nic.in/ccd-sapcc> accessed on 15 December 2014.
2. Government of Chhattisgarh. 2013. Chhattisgarh State Action Plan on Climate Change. Government of Haryana. 2011. Haryana State Action Plan on Climate Change. Government of Jharkhand. 2013. Jharkhand State Action Plan on Climate Change. Government of Karnataka. 2012. Karnataka State Action Plan on Climate Change. Government of Kerala. 2014. Kerala State Action Plan on Climate Change. Government of Madhya Pradesh. 2012. Madhya Pradesh State Action Plan on Climate Change. Government of Odisha. 2013. Odisha State Action Plan on Climate Change. Government of Rajasthan. 2011. Rajasthan State Action Plan on Climate Change. Government of Tamil Nadu. 2013. Tamil Nadu State Action Plan on Climate Change. Government of West Bengal. 2011. West Bengal State Action Plan on Climate Change.
3. Renewable energy potential also varies from state to state. While some States have high solar potential others have huge wind potential. The Odisha SAPCC, for instance, gives emphasis to tapping the unrealized potential of renewable energy, particularly biomass and solar energy in the State. Chhattisgarh's SAPCC document aims at identifying the feasibility for gas based and other alternative source power plants. The Kerala SAPCC indicates the promotion of solar and wind energy as key strategies towards addressing energy security and mitigation of climate change.
4. Such an emphasis may also be linked to two inter-connected aspects of farm irrigation in India. One, the prevailing conundrum, where underpricing of electricity is resulting in overdrawal of

water and hence generating huge adverse environmental effects in terms of wastage of water (Mukherji 2007). Closely linked to this is the recent policy pronouncement i.e. Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), which draws a roadmap for feeder separation for different uses of energy in rural areas such as agricultural consumption and domestic consumption, hence greater accountability and transparency in energy use for agriculture sector.

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