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Institutional Capacities for Climate Change Adaptation in India - A Pilot Study

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Executive summary

Independent of mitigation of greenhouse gases, climate change impacts will affect countries and communities around the world, although not uniformly. Because of local variations in climate impacts and climate change adaptation needs, it is commonly acknowledged that adaptation is mainly a sub-national responsibility to ensure proper and efficient adaptation measures.

Institutions are important in adaptation because they affect the social distribution of vulnerability to climate change, and national and sub-national institutions have different but complementary roles to play. Sub-national institutions are important in adaptation because of their role in mediating between individual and collective needs and solutions for adaptation. In addition, they manage access to resources thus affecting the vulnerability of the most disadvantaged groups in society.

The Institutional Capacities for Climate Change Adaptation in India (ICAI) project has looked at institutional capacities for climate change adaptation in India, giving most attention to the sub-national levels of government. India's National Action Plan on Climate Change, which covers both mitigation and adaptation, is to serve as a basis for the development of State Action Plans on Climate Change. So far, less than half the states have developed these and most have been prepared by external partners, leading to little ownership in government offices.

Because India has fairly a centralized system of government where strategies and priorities are made in New Delhi, we conducted interviews at all levels of government. In addition to New Delhi, we visited two states, Tamil Nadu and Maharashtra. We looked at four dimensions of institutional capabilities, to gauge attention paid to adaptation: knowledge, systems and protocols, incentives and resources. Through this approach we have been able to see how national adaptation priorities get translated into planning and implementation at the state and levels below.

We found that although awareness and knowledge about climate change is fairly high, the uncertainties in the climate scenarios make them difficult for administrators to use in decision making and strategic planning. Even though awareness and attitudes are changing, we see that the adaptation pattern is highly reactive, based on real events, rather than proactive.

When it comes to systems and protocols, the centralized and concentrated authority, and workloads are two apparent weaknesses. At the same time, well-functioning systems and protocols are in place for disaster risk management, and here lies a learning potential for other sectors.

In terms of incentives, the administrative organization, the role of the media and the top-down mode of governance all undermine incentives to take adaptive measures. Little political

and media attention is paid to the policy area, and this means that even though the knowledge is there, India is not fully engaged with climate change adaptation.

As you read this report we urge you to keep in mind that the results presented here are not representative for all of India as this is a very large, complex and diverse country.

The project team

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Philosopher and sociologist, Dr. St. Clair is Research Director at the International Centre for Climate and Environmental Research-Oslo (CICERO), and former Professor of Sociology at the University of Bergen, Norway. St. Clair is Lead Author of the IPCC AR5 for the Working Group II Report; member of the Joint Programming Initiative Connecting Climate Knowledge For Europe (JPI Climate), president of the International Development Ethics Association, board member of the Rafto Foundation for Human Rights and the Laboratory for Advanced Research on the Global Economy at the LSE's Centre for the Study of Human Rights. St.Clair sits on the editorial boards of the Journals Global Environmental Change, Global Governance, Globalizations, Global Social Policy, and Global Ethics.

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Trude Rauken is a political economist specializing on multi-level governance of climate change adaptation. Her work is mainly concerned with the local level of government, use of scientific knowledge in decision making, vertical integration of adaptation across levels of government and horizontal coordination of adaptation across sectors at the local level.

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Kari-Anne Isaksen holds a master's degree in human geography from the University of Oslo. She is interested in development and environmental issues in general, and interactions between climate discourses and policy in particular. For her master thesis about Indian national climate policy she conducted interviews with key actors in the Indian climate debate. She also has a broad knowledge about Indian politics and society from living and working in the country.

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1 Introduction

India has enjoyed tremendous economic development over the past decades, but this development has been very unbalanced. On the one hand, the country has innovative and dynamic pockets which are creating wealth and driving rapid economic growth but on the other hand, income disparities are increasing. Thus, the middle class is growing rapidly and incomes are rising, but there are also still hundreds of millions of very poor and vulnerable people. Especially vulnerable are India's many farmers. Not surprisingly then, the government claims that poverty reduction through economic development is both its immediate and its long-term focus. What does this mean for climate change adaptation and mitigation in India?

This report, prepared under the Institutional Capacity for Adaptation in India (ICAI) project, presents the results of a small pilot study whose aim is to evaluate institutional capacity for climate change, with a particular focus on the sub-national level. It is based on an extensive review of the existing literature on the role of institutions in adaptation governance (see Appendix) and on field work in New Delhi and in two states in India—Tamil Nadu and Maharashtra. In this report, we analyze select political and administrative institutions in India with respect to adaptive capacity to deal with climate change adaption. We look at both national and sub-national levels of government to see how national goals and strategies for adaptation are translated and materialize at the lower levels. Through in-depth interviews with key informants at the national level and in the two selected states, we are able to identify drivers of and barriers to adaptation action. It should be noted that as Tamil Nadu and Maharashtra are amongst the wealthiest of Indian states, the findings presented here should not be generalized to the rest of the country. Rather, this pilot presents a first set of findings from a very diverse country and indeed, we conclude the report with suggestions for further work, which includes performing a follow-up study in other, poorer states, in particular in the Himalayan region.

Our focus on adaptation is deliberate. Climate change discourse in India is often linked to development issues and greenhouse gas (GHG) emissions. In the global negotiations India is one of the emerging economies cooperating in the BASIC group, which also includes Brazil, China and South Africa[1]. India's stance in the climate negotiations has been clear and consistent throughout, and argues for a common but differentiated responsibility (CBDR). For India, CBDR means that the responsibilities for anthropogenic climate change rest with

[1] The BASIC cooperation and what this means for India domestically and internationally is one of the research questions investigated in the CICERO led INDGLOB project funded by the Norwegian Research Council.

developed countries, which are in turn responsible for mitigating it. This does not mean that India is unwilling to limit its own emissions, but this will only be the case when it coincides with economic development. Hence, if mitigation of GHGs limits economic development, India will not be willing to compromise and this stance is by and large non-negotiable. However, India has committed to keeping its per-capita GHG emissions below that of industrialized nations. This is, of course, a low-risk negotiating stance since it would take many decades, even under the most favorable growth scenarios, for India to approach close to the per-capita emissions of the industrialized nations. But while India may not feel itself responsible for climate change or emissions reductions, it will nonetheless suffer the consequences of climate change. Expected climate change impacts include sea level rise, which will lead to coastal erosion, increasing temperatures, and changing monsoon patterns. These impacts will especially affect the Indian agricultural sector. Changes in rainfall and water availability will affect growing seasons and crop yields and it will be the farmers who are dependent on rain-fed agriculture who are the most vulnerable to climate change impacts. Thus, the pressures on the Government of India to deal proactively with climate change cannot be wished or argued away.

2 The institutional approach to adaptation to climate change

The ability of a region to deal with climate change depends upon (a) the magnitude of the potential impacts of climate change upon the region and (b) the nature and scale of resources to which a region has access and (c) how efficiently and effectively it is able to make use of these resources. In other words, a region's adaptive capacity is a function of its economic and institutional bases, which includes also natural resources, technology and social networks (Adger et al., 2007, Jones et al., 2010). Wealthier regions will have the ability to invest more in infrastructures and technologies to reduce vulnerability to climate change, and more efficient use of these resources may yield greater levels of protection.

Within the literature on climate change adaptation, a number of authors have already highlighted the central role played by institutions in determining climate change adaptation capacities. For example, institutions not only determine the management of climate sensitive aspects of society, but they also affect the social distribution of vulnerability (Næss et al., 2005). However, many scholars have also argued that institutional approaches are rarely taken in adaptive capacity studies, and that there is a need to better understand the relationship between individual learning, the underlying communication pathways and the institutional constraints through which adaptive capacity and adaptation measures are affected both within and among organizations (Pelling et al., 2008),

Institutions are broadly defined as the set of structures, rules and incentives that govern individual and organizational decisions about the use and distribution of resources (Ostrom, 1990). This set of structures and incentives is constantly evolving over time, responding to the needs and interests of the principal actors within the system and to external pressures from actors outside the system. Analyzing institutions therefore allows us to understand how different interventions are likely to play out within a given context. Institutional analyses are generally complemented with a political economy analysis, which more explicitly bring out the power relations within the system as well as serve to explain the more informal parts of the institutional set-up.

For the purpose of analyses, institutional and organizational boundaries can be drawn at several different levels, though often, overlaps and intersections between these boundaries are unavoidable. From the perspective of climate change adaptation, it is common to consider institutions at the national and local levels as a first step and to subsequently investigate different institutions with complementary and overlapping jurisdictions at each of these levels. National and local institutions are said to have different, but nonetheless complementary roles to play. For example, the World Resources Institute (WRI) developed a National Adaptive Capacity (NAC) framework for assessing institutional aspects of adaptation which lists five key functions at the national level that are considered critical for adaptation: assessment,

prioritization, coordination, information management and climate risk management (Dixit et al., 2012).

However, a framework that focuses only at the national level is not sufficient for understanding how national adaptation strategies and capacities are understood and, more importantly, implemented, at the sub-national levels (Dixit et al., 2012). Most adaptation action is taken locally because of local variation in needs and impacts. While national level adaptation strategies and agents may, through their access to superior resources and skills, be better at setting overall goals and approaches for adaptation, local institutions are important translators of national level adaptation strategies and are agents for integrating climate change adaptation into existing policies and decision making systems. Thus, it is also crucial to understand the institutional capacity for adaptation at the sub-national level. Local institutions influence climate vulnerability and adaptation by (i) mediating between individual and collective responses to climate impacts and (ii) governing the access to resources, thus determining the vulnerability of the socially disadvantaged groups, who are typically most vulnerable to climate change (Agrawal, 2008).

Given the importance of institutions and their linkages across different scales, and given the relative lack of research which takes an institutional approach, it becomes essential to investigate how adaptation strategies materialize at different levels of government. A first step to doing this is to look at different dimensions of institutions and governance for climate change adaptation at the different levels of government.

3 Study methodology and approach

India is an immensely diverse country--culturally, economically, and geographically. Each state has its own language. Although a majority of the population is Hindu, there are states where the majority is Sikh, Muslim, or Christian. India has some of the world's most advanced technological industries as well as some of the world's poorest peoples. The wealthiest states have a per-capita income of over US$ 1,000 (not PPP adjusted) while the poorest states have a per capita income less than a fourth of that. Some Indian cities are several times wealthier. It has mountains over 8,000m high, deserts, tropical rain forests and practically every kind of climate imaginable, ranging from the world's wettest, to one of its driest, regions.

In view of this variation, it is clearly important to go beyond the national and try to understand the sub-national levels' institutional environment and governance structures. Nevertheless, from a governance and institutional perspective, it is also necessary to study the national level, because administration is fairly centralized and New Delhi wields considerable power in shaping broad policies towards development and environment.

Thus, in our research, we decided to first look at how the national level of government treats adaptation. From here, we moved on to two selected states, going all the way down to the district level in one of them to see how national priorities are translated to lower levels of decision-making.

Our basic strategy was to conduct key informant interviews across the entire administrative spectrum, which meant starting at the national level in New Delhi and working our way down to the village level in Tamil Nadu. In effect this meant conducting interviews at 5 levels: national, state, district, sub-district and village. We did this in order to develop an understanding of the capacities, opinions, attitudes and resources at the various levels of government, to understand better the division of tasks and responsibilities, and also to track how these changed along the administrative spectrum.

At the national level in New Delhi, we met with officials from the Planning Commission, the Ministry of Environment and Forests (MoEF), the Ministry of Agriculture, the Ministry of Water Resources, and the Ministry of Science and Technology. The MoEF is the nodal ministry in charge of coordinating the National Action Plan for Climate Change (NAPCC), which itself was prepared in 2008 by the Ministry of Science and Technology. The NAPCC has created eight National Missions. These are discussed in some detail later in this report, but for now we mention that two of the most important adaptation related missions are the National Mission for Sustainable Agriculture and the National Water Mission. These are coordinated by the Ministry of Agriculture and the Ministry of Water Resources respectively. The Planning Commission is the central agency which develops strategic plans for the Government and is responsible for the allocation of resources. In the case of climate change,

the Planning Commission argues for the incorporation of the goals of the NAPCC missions in India's Five Year Plans to make sure there is a holistic approach to climate change (Planning Commission 2012). The 12th Five Year Plan has quantified targets for environmental and climate change, forests and livelihoods, wildlife, ecotourism and animal welfare, and ecosystem and biodiversity, as responses to the aims of the eight missions. In New Delhi, we also met with representatives from The Energy and Resources Institute (TERI) and the German Agency for International Cooperation (GIZ), as both these organizations are assisting some states in India in preparing their State Action Plan for Climate Change (SAPCC).

We conducted field visits in two states: Tamil Nadu and Maharashtra. Given time and resource limitations, we chose to do an in-depth study of Tamil Nadu and restricted ourselves to a more superficial survey of the situation in Maharashtra. Given India's size and diversity, these two states are obviously not representative of the whole country. Indeed, no small sample of states could be representative of the country. Both Tamil Nadu and Maharashtra belong to relatively more developed regions of India having large urban populations, high degrees of industrialization and higher rates of literacy. They have each enjoyed some of the highest economic growth rates among Indian states during the past ten years. Although, as in the rest of the country, the majority of the population in these two states is engaged in agriculture, both states have rather diversified economies with strong industrial sectors. In fact, we chose to conduct our study in two of the wealthiest states of the country in order to get an idea of climate change adaptation capacities in well-resourced regions. Our plan is to later complement this study by investigating adaptive capacities in two other states at the other end of the economic spectrum.

3.1 Tamil Nadu

Tamil Nadu is the 7th largest state in India state with a population just over 72 million. It is the most southern state, and its capital is Chennai. Even though a majority of the population lives in rural areas and works in agriculture, Tamil Nadu is one of the most urbanized and industrialized states in India. Its industrial production accounts for one third of the state's economic output, and is centered on the manufacture of heavy vehicles, textile milling, food processing and chemicals. The state's agricultural production is highly dependent on rainfall and the failing of the monsoons can have severe consequences for farmers. To remedy this, both farmers and the government are focusing on developing methods for irrigation, water storage and ground water extraction (Janakarajan and Moench 2006; Senthilkumar et al. 2008).

3.2 Maharashtra

Maharashtra is the second largest state in India, with a population just surpassing 112 million (slightly less than that of Germany and Poland taken together). It is India's wealthiest state, accounting for 15% of the Indian GDP. Maharashtra is also the most industrialized state in the country, with a long history of textile production, and now chemical and technology industries. Its capital, Mumbai, is the financial hub of India and home to the world-famous Bollywood film industry. Like Tamil Nadu, Maharashtra has a large urban population, which accounts for close to 46% of the state's population. Still, almost 65% of the population is employed in agriculture or supporting activities. More than half of agricultural production is rain-fed, leaving farmers vulnerable to insufficient rainfall. Droughts are the most important meteorological challenge to agricultural production, and diverse methods to overcome water stress are being and have been developed (Phadke 2002). Maharashtra also has a very large

and important sugar industry, although this is less exposed to droughts because of extensive irrigation projects which have been developed over the past decades.

3.3 Interviews

In Tamil Nadu, we conducted formal interviews with 10 respondents and in addition three informal interviews. Of the formal interviews, seven were at the state level and three at the district level. In addition we visited a tsunami orphanage for girls and a coastal village which had been affected by the tsunami in 2004. In this village, in order to gauge how the government conducts environmentally related relief and rehabilitation works, we met with a group of fishermen and visited a coastal protection plantation and a housing reconstruction project. In addition, the visit allowed us to observe administration at the district and lower levels. At the state level we interviewed the Agricultural Production Commissioner, the Secretary to Government for Municipal Administration and Water Supply, the Forest Secretary and two of his assistants, the Commissioner of Revenue Administration, the Project Director for the tsunami project management unit, the Special Advisor for the State Planning Commission, the Chief Engineer for the Water Resources Department, and the secretary for disaster management. At the district, we met with the District Collector, and also with the tehsildar (a sub-district administrative officer hired at the district level), a village panchayat president and several community members.

As mentioned above, we spent less time in Maharashtra than in Tamil Nadu. Here we conducted two interviews, both at the state level: one with the Principal Secretary to the Rural Development and Water Conservation Department and the other with the Assistant Chief Secretary to the Agricultural Department. No visits were made to districts or villages.

All interviews were semi-structured, meaning that the same topics were addressed in each interview, but that respondents could elaborate on topics where relevant. To gain insight into how respondents were thinking about climate change and potential impacts, we included questions to gauge respondents' views on relevant climate impacts in their region, from where this knowledge originated, and their attitudes towards this knowledge.

Knowing that adaptation will take place in existing decision-making systems, we wanted to learn more about the current institutional capabilities and hence included questions about systems and protocols that apply in respondents' own work. Within these systems there are already set priorities and we wanted to know how adaptation was considered in relation to these. This meant asking questions about whether or not climate change had increased its salience as an issue for decision-making in relation to or competition with other planning priorities over the past years; who within existing decision-making structures were concerned with climate change issues, where relevant, and whether or not climate change was seen as an important part of the respondent's own work. Another way of gauging the attention paid to climate change was to ask the respondents about their access to economic and administrative resources, whether or not these resources had any particular climate change label on them, in what way resource constraints play out and whether or not the respondent thought he or she had enough resources to devote to climate change issues.

4 Political economy and institutions: politics and public administration in India

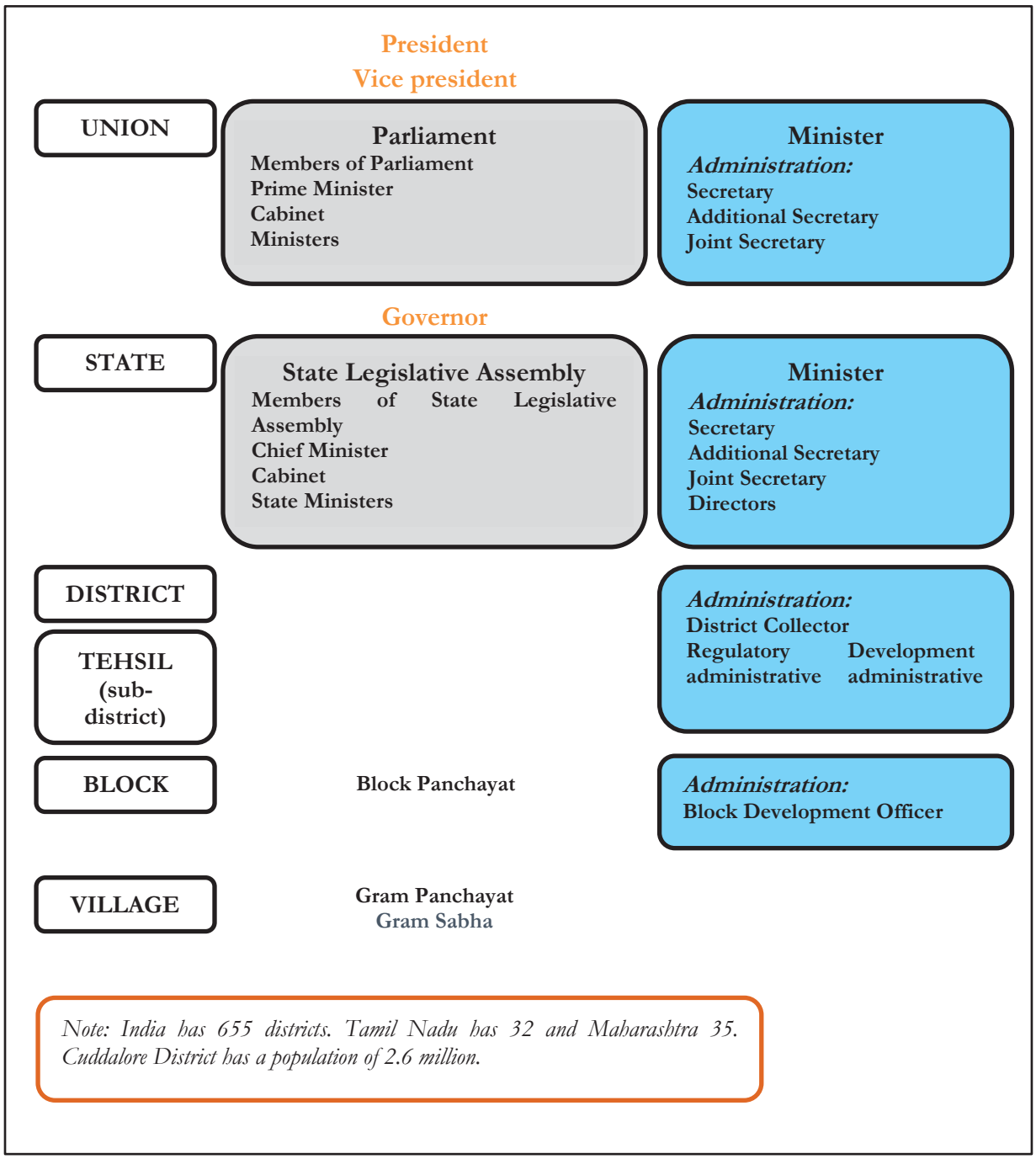
The political and administrative architecture of India is central to understanding its institutional bases. Those familiar with the Indian political and administrative system may wish to skip section 4.1., which describes the system's architecture. Section 4.2., however, will be useful to understand the dynamics behind how political and administrative decisions are taken.

4.1 Political and administrative arrangements

India is a parliamentary republic (see figure 1). The head of state is the President, whose powers and responsibilities are roughly analogous to that of a constitutional monarch in Europe. The President is appointed to a five-year term by the Parliament, which generally seeks a consensus candidate though the preferences of the ruling party in the Parliament hold more weight. Presidents in India have generally been selected from the ranks of retired politicians with due consideration given to a symbolic rotation of identities in terms of religious affiliation, gender, and caste background of the candidate.

The Parliament has two chambers, and real political authority rests in the lower chamber, which consists of 535 Members of Parliament (MP). Each MP is elected from a specific geographical constituency based on the number of votes received. There are no run-offs. Over the last two decades no single political party has received an absolute majority and, consequently, the largest party in Parliament has had to cobble together coalitions, which has created difficulties in legislating, particularly on controversial issues. The main reason for this has been the rise of regional parties reflecting regional identities and interests.

Figure 1, Indian political and administrative structures



India has a federal system of government, with areas of legislative and administrative responsibilities demarcated and divided amongst the union and state governments by the Constitution via three lists: The Union list over which the Union Government has exclusive legislative jurisdiction, the State List over which the state governments have exclusive legislative jurisdiction, and the Concurrent List in which both the Union and the States can legislate, though in the event of contradictions, the Union legislation prevails. In practice, there is a fairly high degree of centralization in terms of administration because of the system

of budgetary allocations. While the Union Government is required to share revenues with the state governments, nationally defined missions often dictate how the money can be spent.

At the central level, administrative tasks are organized according to Ministries, headed by a Minister who is a Member of Parliament. There is a fairly well-known hierarchy of Ministries and these are allocated based on the power base of the MP from the ruling party or in terms of the number of MPs which a political party contributes to the ruling coalition. Ministers therefore may not necessarily be particularly passionate or knowledgeable about the ministries they head. They do, however, exercise a large degree of control over their ministries.

The administrative structure supporting the minister also consists of national and state-level bureaucracies. At the apex of the administrative structure is the Indian Administrative Services (IAS). There are several other central government services such as the Indian Foreign Service, Police Service, Postal Services, Forest Service, etc. The top administrative posts in both the Union and Central Governments are filled by IAS officers. IAS officers are recruited centrally, but after their training they are inducted into the administrative cadres of different states. Therefore, they spend most of their careers in the services of their state governments, with periodic deputations to New Delhi. Lower level positions in the state governments are filled with state administrative services officers who are recruited from within the state itself. Officers from the IAS and state administrative services are generalists, which means that they rotate among different departments. Technically, an administrative officer is assigned to a particular post for around 3 years, but in practice, their tenure rarely lasts this long. Technical recruits, such as engineers, generally spend their entire careers in the departments to which they are recruited.

All recruitment is conducted through examinations and interviews by public service commissions at the central and state levels, and is based on merit. No evidence exists of nepotism or patronage in recruitment to these services. Job tenure is not revocable, except for in the case of criminal misconduct, though in practice civil servants are very infrequently prosecuted or convicted.

4.2 Political economy of governance in India

In this section, we present a brief overview of the political economy of governance in India in terms of its relevance to climate change adaptation. These are a part of our findings. However, it is presented here for organizational purposes.

Indian politics and administration combine contradictory elements of hyper-responsiveness to the electorate and insensitivity to the population in general. This can be traced to the rise of the influence of the highly competitive news media, which has emerged over the last couple of decades as the TV sector was opened up to private broadcast and the explosion of cable TV news channels. An active civil society has reinforced this tendency, allowing certain causes to occupy media space and force the government to act. At the same time, issues that do not enjoy media attention are often ignored.

Politics is often personality, rather than policy- driven. Reversals of policy after a new party comes into power are common. In Tamil Nadu, for example, we drove past an imposing new building and were informed by our taxi-driver that the previous chief minister had had it constructed as the new Secretariat (state government headquarters), but that after his party lost the election, the current chief minister refused to move the government into the building and was instead converting it to a hospital. Another similar defining feature is political

obstructionism, where opposition parties agitate on the streets against the policies and programs of the incumbents.

A system of informal petitioning exists and is quite strong. Some analysts have traced this to tendencies to establish patron-client relationships (Vashney, 2000), but it is partly a necessity of the resource constraints given that rule-based administration is too complex, and there are not enough resources to satisfy all of the demands of the population or even their legal entitlements. These resource limitations force legislators and administrators to ration public resources and public services through access or other non-rules-based allocation systems.

As noted above, bureaucrats have strong job security. They can rarely be dismissed or demoted or superseded in promotions. The intent is, of course, to protect them from political influence. However, the legislators exercise their authority over bureaucrats by determining their postings, and these can often be an effective tool of control. Thus, we see that bureaucrats are constantly shifted around and rarely complete the recommended three-year term in their posting. This is an essential component within the system of rent-seeking and corruption within Indian governance.

However, in recent months, an interesting social opposition has emerged to the entrenched systems of rent-seeking. Reports of mismanagement and corruption have been released by the Comptroller and Auditor General of India, leading to losses of billions to the public exchequer and these have been widely publicized, putting legislators on the defensive. Simultaneous agitation by civil society actors, again supported by the media, have forced to Parliament to enact new anti-corruption legislation. This has resulted in an anti-incumbency sentiment and the emergence of a new non-traditional political party in the recent local government elections in New Delhi that has successfully campaigned on an anti-corruption platform.

To conclude:

1. Administration in India is officially highly formalized but in practice based on informal mechanisms including petitioning and ad-hoc responses.

2. The political class micro-manages administrative functions.

3. Citizens can bypass the administrative structures and appeal directly to politicians, and then instructions are passed on through the administrative machinery.

4. Competition in the media has made citizens more assertive and in some cases the politicians more responsive.

5 The Indian Climate Change Action Plans

In 2008, India adopted its National Action Plan for Climate Change (see Box 1 for a full overview). As mentioned above, the NAPCC includes eight national missions. For adaptation, NAPCC stresses three sectors as particularly important: agriculture, water and forestry. Two of them have national missions in the NAPCC, agriculture and water. These are inherently connected and both very important to India's economic development.

Considering agriculture's importance to the Indian economy and to poverty alleviation, climate change impacts on this sector can have a large impact on the country's development and its food security. The National Mission for Sustainable Agriculture (NMSA) has four focus areas: dryland agriculture, risk management, access to information and use of biotechnology. This means developing crops resistant to more droughts and pests, better water/soil conservation methods and ensuring training and stakeholder interaction and financial support for farming equipment. The priority areas to improve risk management are better insurance schemes, increased certainty in weather models, accessible information in local language, GIS and remote sensing methodologies improvement, vulnerability mapping and development of forward looking contingency plans (Government of India 2008). The NMSA also underlines that it is important to provide access to information for farmers about soil, weather, water resources and land-use on a regional level, better monitoring of water availability, information about off-season crops and dissemination of relevant climate and socio-economic knowledge at the block level.

Water is directly linked to agriculture. Many parts of the country are water stressed today and are likely to be water scarce by 2050 (Government of India 2008). The National Water Mission (NWM) suggests new regulatory regimes for entitlements, pricing and incentives for more water efficient conduct. The NWM sees it as necessary to have a better understanding of present and future water availability and suggests studies covering water modelling, flood mapping, monitoring techniques and weather and rain gauge stations. The mission also acknowledges the need for better systems for auditing and regulating ground water use as well as better storage capacity to ensure good management of these resources. Very concretely, storage and irrigation technology and capacity need to be improved for various users and needs. To better conserve wetlands, key tasks are to get a better understanding of the effects of projects on wetlands, develop a wetland inventory, increase awareness of the need to protect wetland ecosystems, and enhance control of wetland resources through developing, passing and implementing a regulatory regime that treat wetlands wisely (Government of India 2008).

Both missions identify areas that are important for adaptation, but they say little on how priorities should be made. Additionally, suggestions for operationalization are missing. Instead it can seem as if the NAPCC presumes that the institutional capabilities are in place at the sub-

national levels to prioritize tasks and operationalize them. If this is not the case, the missions run the risk of not being implemented. Given the dependency of marginalized groups on local institutions, their ability to plan and implement climate change adaptation measures is important for reducing vulnerability at the local level.

Box 1. India's National Action Plan for Climate Change (NAPCC)

The NAPCC from 2008 covers both mitigation and adaptation (Government of India, 2008). The NAPCC does not make any climate mitigation promises that will be in conflict with the economic growth rate. At the same time it identifies synergies between economic growth and limiting GHG emissions with clean energy sources, energy efficiency goals etc. At the same time it is imperative that all parts of society understand the threats of climate change. Under NAPCC there are eight national missions:

1. **National Solar Mission (Mitigation)**
   - Increase the share of solar power in the energy mix
2. **National Mission for Enhanced Energy Efficiency (Mitigation)**
   - Market based mechanism for energy efficiency in energy intense industries
   - Energy efficient appliances
3. **National Mission on Sustainable Habitat (Mitigation)**
   - Energy conservation building code
   - Recycling and waste management
   - Better urban planning and improved public transport systems
4. **National Water Mission (Adaptation)**
   - Increase water use efficiency by 20%
   - Conserve water
   - Minimize water waste
   - Ensure equitable distribution
5. **National Mission for Sustaining the Himalayan Ecosystem (Adaptation)**
   - Enhanced understanding of glacial changes
   - Cross border cooperation on glacier monitoring
   - Promotion of community based adaptation for Himalayan farmers
   - Maintain 2/3 of area in mountainous regions under forest
6. **National Mission for a Green India (Mitigation)**
   - Increase carbon sink capacity
   - Increase forested land from 23% to 33%
   - Rs 6000 crore allocated to the Joint Forest Management Committees for afforestation
7. **National Mission for Sustainable Agriculture (Adaptation)**
   - Identify and develop new crops that are more resistant to a changing climate
   - Climate services to be able to recommend changes in practices
   - Improve productivity of rain fed agriculture
8. **National Mission on Strategic Knowledge for Climate Change**
   - Identify and respond to climate change
   - Better understanding of socio-economic impacts of climate change
   - Climate change research fund
   - Knowledge dissemination

According to the NAPCC, the states are supposed to develop their own State Action Plans on Climate Change (SAPCC) where they demonstrate how the eight missions from the NAPCC will be prioritized and implemented at the state level. From the perspective of some civil society organizations, Indian states are not demonstrating leadership on climate change issues. A critique of SAPCCs published by one such organization faults them for not having targets,

timelines, financial implications and allocations, and for not emphasizing agriculture, food security, water, and the rights of forest dwellers (Jha, 2011). Another report (Mandal et al., 2013) argues that there is a lack of scientific knowledge and inadequate investment in climate science at the state level. While it may be disputed whether or not the plans are good enough, we should also keep in mind that these are initial steps in an ongoing process being conducted in an environment of imperfect and disputed knowledge and limited resources.

One respondent, who was involved in the preparation of the NAPCC, informed us that it was produced in an intense effort compressed into six weeks in order to have it ready for the summit meeting in which the Prime Minister was to declare India's position on climate change. Perhaps it is then not surprising that in terms of planning for climate change adaptation, especially in water management and agriculture, climate change per se is being mainstreamed in an unclear manner. Now, the impacts of climate change are potentially disruptive for important administrative functions such as agricultural support, water supply and disaster management. Therefore, the general approach of the NAPCC has so far been to strengthen normal administrative functions such as those aimed at improving water use efficiency, which is something they would be doing anyway even if climate change did not exist. This approach also has some support amongst researchers of climate change adaptation. For example, Smit and Pilifosova (2003) argue that climate change and equity goals can be jointly pursued by initiatives that promote the welfare of the poorest members of society. Yet, an unanswered question remains: What is the value-added of climate change concerns in administrative reforms? Has the government been doing anything differently in response to climate change concerns or has it merely re-labelled existing concerns? For example, non-irrigated agriculture has always been an issue of concern given that (a) a majority of farmers still practice dryland agriculture and (b) Indian monsoons have always been irregular, and when they fail, they tend to cause immiseration.

6 Field research findings

This section describes the findings from our interviews with central and state government officials. Our interviews were structured in such a way as to enable us to analyze institutional capabilities for climate change adaptation along four dimensions: (i) knowledge and attitudes, (ii) systems and protocols, (iii) incentives, and (iv) resources.

The first dimension, knowledge and attitudes, helps us to gauge the level of understanding that legislators and administrators have of climate relevant issues, which in turn can help us predict what kinds of actions they will be willing to take to increase adaptation capabilities and with what degree of enthusiasm.

The second dimension, systems and protocols, helps us to understand how decisions are taken and executed, which in turn can help us identify potential bottlenecks in adopting and implementing climate change adaptation strategies.

The third dimension, incentives, helps us to understand underlying motivations and behavior of legislators and especially administrators, which in turn can help us think of better designs for interventions aimed at increasing climate change adaptability and reducing vulnerabilities, especially for the economically and socially marginalized segments of society.

The fourth dimension, resources, helps us to understand how far the governments at different levels can go in terms of implementing programs and projects for climate change adaptation.

6.1 Dimension 1: Knowledge and attitudes

To gauge our respondents' knowledge and attitudes with regards to climate change in general and adaptation in particular, we asked several questions related to (a) their familiarity with the various important climate change documents that have been produced, such as the IPCC reports and National and State action plans, (b) their knowledge of the potential impacts of climate change on different segments of the population, (c) their opinions on how climate change would affect the tasks and responsibilities of their departments, (d) their opinions and observations on the knowledge and attitudes of other politicians on issues related to climate change, (e) and their sense of urgency with regards to climate change. We were particularly interested in understanding how far climate awareness permeates into planning and administration at the local (state and district levels). For example, if a respondent has knowledge about climate change, but cannot link it to specific practices within the organization, then that would provide us an insight into both the level of specific actionable knowledge as well as about prioritization.

We find that general knowledge about the causes and consequences of climate change is fairly well-diffused throughout the administrative structure, right down to the district level. Below this level, i.e., at the block and village levels, knowledge about climate change is sparse, though when queried in terms of weather patterns, there is a lot of awareness and concern about the

changes that have been witnessed over the last years regarding average temperatures and rainfall patterns. For example, fishermen from a village we visited in Cuddalore district of Tamil Nadu reported rising sea temperature which has resulted in fish now having to be caught in deeper waters than before. (They also report that the government is compensating them for lower catches.) An agricultural officer who was otherwise unaware of the SAPCC was nevertheless quite aware that climate change will affect the agricultural sector severely, not just in terms of monsoon variability, but in terms of how average temperatures affect crop production and pest incidence.

None of our respondents were specifically charged with climate change related responsibilities, yet all of them had a basic understanding of how climate change would affect India in terms of changing monsoon patterns (in terms of both duration and intensity) and its subsequent impacts in terms of more frequent extreme weather events (droughts as well as flooding) and coastal erosion. At more senior levels in both the national and state governments, respondents were aware of the main causes of climate change, and generally were of the opinion that Western countries' emissions are largely to blame for climate change. The main source of information about climate change was the general media, although several respondents did indicate that climate change is a subject of discussion in their periodic training and refresher courses.

To a varying degree, the respondents managed to see the link between climate impacts and vulnerability. Several underlined the vulnerability of marginalized groups and in particular the poorest farmers dependent on dryland agriculture and explained how their situation could become even more difficult as a result of climate change. In Tamil Nadu, especially the agriculuture setor, had close cooperation with the universities in order to increase the knowledge base about how climate change may affect agricultural production, but at the same time this knowledge was not being used to create awareness among farmers.

Knowledge about official climate change reports is sketchy. While most (but not all) of the respondents are aware of the existence of the government documents that have been or are under production (such as the NAPCC issued by the MoEF and the SAPCCs being produced by the states), none of them had actually read the reports or seemed particularly concerned about their contents.

The mode of production of these reports can allow us to make some hypotheses about both knowledge and general attitudes about climate change. India's NAPCC requires the states to produce their own SAPCCs. Some 13 states have so far prepared these plans and, as far as we can tell, the production of all of these plans has been outsourced to consultants, and it did not appear to us that these consultants had formed a very close working relationship with their counterparts in government. Moreover, most of the reports that have been completed have been prepared under a co-operation agreement with the German agency GIZ, so to a large extent, the process has been donor driven.

In terms of attitudes towards climate change, we found the responses to be more varied. While none of the respondents felt that climate change adaptation was a high priority given other more immediate and pressing needs of public administration and poverty alleviation, some respondents felt that climate change was hyped by the media and a "certain segment" of the Indian population (i.e., urban, young, upper class environmentalists) acting in concert with their counterparts from "Western countries".

Another fairly widespread attitude about climate change from an administrative perspective is that the level of scientific knowledge and understanding about the impacts of climate change is still too vague and uncertain to be useful for decision-making. The current set of climate change scenarios, which have been produced use a scale much larger than that which is useful for administrative action. A dilemma is that by reducing the scale of the area under consideration, even more uncertainty is introduced about future events so that they still cannot be used by administrators.

Because of the sensitivity of the climate issue in terms of international negotiations and commitments, overall direction for developing climate change policy and actions has been placed within the Prime Minister's Office (PMO) with the MoEF acting as the nodal ministry. Some respondents said that the placement of climate change within the PMO was an indication that the government was taking the issue seriously and providing leadership. In terms of climate change adaptation issues, however, it does not appear to have had any appreciable effect.

At the state level, respondents indicated that the chief ministers (of Tamil Nadu and Maharashtra) had made some public statements about climate change, but that they had not so far indicated that it was a pressing administrative priority.

When it comes to the general public one respondent (a retired senior administrator) noted that people are so far not receptive to climate change knowledge per se and that it should be treated as a process of sensitization.

Knowledge and attitudes are inter-linked. According to one respondent,

> "Unless there is a study or other kinds of evidence clearly quantifying and indicating the risks emanating through climate change, legislators are unlikely to be persuaded to take strong measures."

However, awareness and attitudes are changing quickly. One respondent, a mid-level bureaucrat, indicated that he believes that all concerned communities are becoming aware that natural disasters are becoming more unpredictable, more frequent and more intense:

> "The Orissa cyclone (which left over 20,000 dead) was a turning point. Even 10 days after the disaster, we were finding dead bodies hanging from the trees. After this the general attitude towards disaster management changed throughout the country. Even at the community level, while earlier they might have been uncooperative or reluctant to think about or work for capacity building for disaster management, now they are quite open about it and very cooperative. Before, they felt that "if it does not affect me, then i don't have to worry about it.'"

The same respondent also felt that:

> "Community attitudes have changed. They are more aware now and their expectations are much higher. Whereas earlier they might have been satisfied with being saved, now they expect [electric power] generators given that cyclones now come with a few days' advance warning and they know that the administration knows there will be power cuts."

This symbiotic expectations-responsiveness cycle is new and encouraging, but also points to an inherent limitation for climate adaptation measures. A reactive adaptation pattern is common in many areas because measures are based on real events rather than uncertain

scenarios. Thus for concrete and immediate issues, we can expect that the government and administration will take energetic steps to address the issue, but for others that cannot be so concretely examined, little attention will be paid.

Part of the reason for this is the role of the news media. Over the last decade or so, cable television channels have been proliferating, including news channels. The intense publicity that is generated by these competing channels on one of their favorite topics--governance failures--makes it very difficult for legislators and administrators to avoid responsibility for faults that can credibly be attributed to them. Hence, we have seen that in the case of disaster relief, major improvements have been witnessed, which is not the case in other mundane governance areas which do not pique media attention.

6.2 Dimension 2: Systems and protocols

We asked questions about systems and protocols to get an idea about general institutional capabilities. These capabilities are not necessarily climate change specific, but as they are important to understanding how well the organizations are prepared to perform their core tasks, they also help us to understand how the organization will approach climate change. Within this set of questions, we asked about leadership, planning structures, and communication and outreach with the main stakeholders.

As we noted in the previous section, public administration in India is centralized and hierarchical with power and resources flowing down from the top. Leadership on the issue of climate change thus has to be seen in terms of the signals being sent from the political heads, i.e., the Prime Minister and the concerned ministries at the national level and the Chief Minister at the state levels.

So far it has not been possible to accurately gauge the level of communication regarding climate change issues. At the lowest levels, government agents are always out in the field trouble shooting and meeting with constituents. For example, villages in Tamil Nadu have an outreach program conducted by the district administration which includes a monthly mass contact where administrators from the district go out to field together. Inasmuch as climate change is being subsumed into the government's usual business, one could make the argument that there is fairly consistent communication. Major initiatives of the government also regularly create forums for experts and civil society groups to interact with government officials and provide inputs and opinions. One example of such forums was the "National Consultation Workshop on Preparation of State Level Strategy and Action Plan on Climate Change" (see MoEF 2010).

However, in terms of systems and protocols, two important institutional weaknesses are apparent: authority is extremely centralized and concentrated, as are workloads. As one respondent eloquently phrased it:

> "Decision making is concentrated among the few who have power, those who have the power do not have the time to think about strategic planning and those that have the time cannot be entrusted with such tasks."

This means that all decisions have to be thoroughly vetted and all implementation fully overseen by senior officers. In fact, one respondent who was in charge of civil supplies said that he would receive multiple calls daily from legislators enquiring to make sure that no items would be in short supply in the (private) markets during the annual Diwali festival. One

reason for this is that India being a vibrant media-frenzy democracy, neither senior legislators nor senior administrators can afford to be caught off guard. Since internal disciplinary measures cannot be employed (government tenure is very strong and positive incentives weak to non-existent), delegation and attribution of responsibility is difficult. Another reason for this is that as part of their electoral strategies, politicians actively promote a clientalistic approach to government.

This tendency towards micromanagement coupled with legislators' frequent usurpation of administrator's time for personal requirements means that there is little space for forward looking or innovative planning. One respondent told us, "we would like to do what is important, but we end up doing what is urgent, which is not usually important."

It also means that normal bureaucratic protocols are often subverted. We were told of one case in which the lining of irrigation canals by the water resources department to prevent seepage and loss was stopped by legislators. Apparently, farmers who feared that the lining would prevent water from recharging their wells and enlisted the support of their legislator. While this led to a "good" (i.e., responsive government), too much reliance on such interventions means that appropriate standard protocols are not developed, that administrators tend to view community members as obstructions to their work, and that benefits and protection often accrue only to the "squeaky wheels".

Everything important happens in mission mode in India. A mission is a centrally defined focus area with vast sums being allocated through the planning commission. Missions penetrate almost all areas of government responsibility: there is a National Urban Renewal Mission, a National Rural Health Mission, a National Total Sanitation Campaign and even a National Milk Mission and a National Translation Mission. Typically, the Union Government provides about 50-75% of the funds and state governments have to provide the rest. This co-funding means that to some extent, there has to be local ownership, but clearly the priorities are defined in New Delhi, i.e., with central guidance and funding.

One area where the governance situation is a lot more positive and where systems and protocols are strong, however, is disaster management. Here capabilities are particularly well-developed, especially at the local level and especially along the coastal belt. This year alone, several severe tropical storms have battered the eastern coast of the country, but because of huge investments in predictive capabilities and administrative capacities, the intensity of these storms was timely and accurately predicted and appropriate evacuation and protection measures were taken. As a result, very few lives were lost.

A program, the Coastal Disaster Risk Reduction Program, mentioned by one of the respondents, is illustrative. The program involves setting up loudspeakers in all of the almost 600 hamlets along the Tamil Nadu coast, which have been identified as vulnerable and basically involves capacity building at the local level, which means teaching the community about the meaning of different types of sirens and what measures they should take. The capacities are to be developed by the state administration's field workers. When asked about the role NGOs and CSOs play or could play in the process, the respondent commented that although some of these organizations are good, the big problem is scalability.

While disaster management is one of the key concerns raised by climate change, especially from the adaptation standpoint, one respondent responsible for disaster management said that "regarding climate change, the MoEF handles the theory, they have the specialists. We only

handle the outcomes based on immediate weather reports. One of the main lessons we learned from Uttarakhand is that we have to be always prepared."

For agriculture, the picture is mixed. There are weather watch groups chaired by the secretary of agriculture in each state. Each week the group meets to discuss the predictions, water reservoir levels, and long term scenarios and makes action plans for different departments. However, in New Delhi we were informed at the Ministry of Agriculture that detailed cropping plans based on weather information are provided for all of the districts in the country, but when we made enquiries at the district level, they were not aware of such plans.

6.3 Dimension 3: Incentives

Three factors that have been mentioned previously play a large role in determining incentives for how legislators and administrators work on climate change issues.

First, administrators are generalists and for various reasons they are shunted around between different departments quite frequently. This results in the fact that they are more inclined to work on relationships and smooth functioning of their departments than to focus on strategic planning. One respondent confirmed this state of affairs:

> "There is frequent shifting of the bureaucrats, so again, the incentive to occupy oneself with longer term strategic planning is limited. They are aware of climate change, but they do not take account of it in their strategic planning."

Second, government policies are also media driven to quite some extent. Since climate change has not yet appeared as an important governance concern, there seems to be little interest in prioritizing it over other more pressing concerns that would have more clearly marked electoral consequences.

Finally, governance and responsibility in India is congested at the top. Therefore, both legislators and administrators prefer policy reforms that do not require careful oversight and that are likely to work practically automatically after they are first instituted. That is why they gravitate towards technological solutions where the "supply chain of administration" is shortened. An illustration of this is direct deposit of funds in the case of the National Rural Employment Guarantee Act. Instead of routing cash payments through their field offices, which could lead to leakages, administrators would prefer making direct deposits to the beneficiaries' bank accounts. Such technological solutions, especially those based on mobile platforms, are generally preferred by policymakers. Similarly, early warning systems for extreme weather events that are based on sending SMS are also both liked and effective. This means that reducing climate based vulnerabilities would find more uptake if the solutions could find appropriate technological packaging. As a corollary, solutions that are management-intensive will not be attractive for legislators and administrators.

6.4 Dimension 4: Resources

To answer the question about whether adequate resources are being allocated to climate change adaptation, we must take a more nuanced approach. On the surface, it would not be difficult to argue that in fact climate change in general and adaptation in particular are being allocated few financial or technical resources. Moreover, the recent global economic slowdown has reduced the planned outlays for climate change adaptation actions. On the other hand, many of the adaptation objectives of the NAPCC are being realized through other

channels, such as through irrigation projects and long standing investments in meteorological systems and technologies.

But, in any case, resource constraints are not just financial. There are also severe constraints in administrative capacity, especially at the sub-national levels. There is a very large human scale to the operations of the various levels of government in India. One of our respondents mentioned his previous position at the municipal corporation, where he noted that he was in charge of 19,000 people, pointedly contrasting it with the situation in Norway. This is not an isolated case. Under the agriculture department there are 14,000 technical and support staff. While these numbers may give the impression that the government staffing is huge (and perhaps wasteful), the truth is that in critical areas, including project management capacities, the government is severely understaffed. Indeed, in many cases, there is under-utilization of already earmarked funds for projects, so the constraints are less financial and more administrative.

As in decision making, there is also a heavy centralization of funds, which exacerbates the problem of administrative capacities constraints. The centralization of authority and resources is especially apparent at the district level and consequently at lower levels of administration also. According to one respondent from Tamil Nadu:

> "Policies are framed in Chennai, especially at the senior level. The funds are also allocated from Chennai. We have no experience or expertise here at the district level. If we have to engage an organization or consultant, it would cost too much. So, the CM has to decide and approve. We send some proposals based on local demands and interests and knowledge in February/March, but the funding is totally discretionary."

Another resource that is lacking is local level knowledge networks. There is a national mission on strategic knowledge for climate change, but little useful adaptation knowledge has been produced so far. Here lies a potential for building capacity that has not yet been realized.

The private sector can rarely fill the breach. For example, take the case of crop insurance, an area in which the World Bank is also trying to solve systemic weaknesses. According to one respondent:

> "The agriculture department handles crop insurance, but it is not a very useful system. If the crop insurance is to compensate farmers adequately for their losses, it will be too expensive. If it is cheap, then it will not be sufficient. As a result, generally there is a village wide coverage that charges a 2.5% premium, but the benefits are not much. In the end, it is always a gamble with the monsoons, and in the end it is always the government which will have to provide relief. We can't leave it to the private sector."

Summing up:

The findings show that knowledge and awareness about climate change among the interviewees is fairly high; the uncertainties in the climate scenarios make them problematic to use in decision making; centralized systems create disincentives for adaptation at the sub-national levels; and there is a lack of financial resources and administrative capacities with which to implement climate adaptation measures.

7 Concluding remarks and implications for Norwegian climate cooperation in India

The ICAI pilot study set out to identify how climate change adaptation is treated across different levels of government in India. Through interviews from the national to the village level, we have been able to understand how central level goals and priorities for adaptation are being translated and implemented at the sub-national levels in two states. It should be noted here that the findings, claims and conclusions presented in this report are linked to an investigation in two of the wealthiest states in India; the situation may be quite different in other parts of the country.

Dividing the topics into knowledge and attitudes, systems and protocols, incentives and resources enabled us to identify drivers and barriers for adaptation work at different administrative levels. What became apparent through our interviews is that even though there is much knowledge and awareness about climate change across these levels, little action is taken because of other more pressing priorities related to poverty management and alleviation. Our respondents displayed knowledge about climate change and its consequences in their regions, but there was little ownership or sense of responsibility, indicating that adaptation is not a priority. Part of the explanation for this is to be found in the uncertainty inherent in the future climate scenarios, which make them difficult for administrators to use as a basis for planning. Additionally, when climate change strategies are to a large extent externally, or donor-driven, the potential for ownership within government becomes limited. Furthermore, in India, where political and administrative attention is now being driven by a competitive and vociferous media, a complex problem like climate change adaptation may not be given appropriate news coverage. This again reduces the incentive for political attention to be given to adaptation measures.

One area stood out though. When it comes to disasters and extreme weather events, systems and protocols are very much in place. Still, this is a reactive adaptation pattern, and it is fairly common across countries and is also the case in Norway (Amundsen et al., 2010, Rauken and Kelman, 2010, Dannevig et al., 2012). In the studies from Norway it was found that the well-preparedness for natural disasters has led to a sense of complacency and attitude that climate change will not lead to any challenge that cannot be overcome. This was not the case in the two states we studied, and is probably because lives and livelihoods are much more directly threatened by extreme weather events. All these issues are relevant for Norwegian bilateral relations with India.

This short study has started scratching the surface of questions regarding which institutional capabilities are found at both national and sub-national levels of the Indian government and public administration for climate change adaptation. Moreover, the findings presented here are not generalizable to the rest of India, but speak to the situation in two realtively wealthy states.

Given that resources are not available to do a full spectrum analysis of the different Indian states in terms of climate change impacts, vulnerabilities and adaptive capacities, we suggest that a useful approach would be to balance the investigation presented in this report with a study of less- or least-well developed and economically resourced states. The need to understand the situation across a variety of Indian states has been expressed earlier by the Norwegian Embassy in New Delhi and the Norwegian Ministry of Climate and Environment, who wish to obtain more in depth understanding of adaptation needs across this large and diverse country. We propose a similar study on two of the less developed states in the Himalayan mountain region, where there are high levels of vulnerability as well as physical, logistical and administrative challenges, in order to get a better understanding of the variation in adaptation needs and contraints in India. Indeed, the Himalayan ecosystem is quite unique, which is why a separate national mission for the region was included in India's NAPCC. On this basis, Norway would be able to strengthen its bilateral cooperation with India on climate change adaptation and in terms of analyzing India's stance in the international climate negotiations.

7.1 Proposals for follow-up work

All Parties bring domestic factors to the negotiations table and these are shaped by actions and preferences at different levels. The preferences are not set, but they are rather in flux. Thus we argue that it is important to not only identify what shapes preferences, but also how they change. At the same time, as long as adaptation is largely a local issue when it comes to planning and implementation, the role of the sub-national levels must be emphasized in order to understand what shapes India's stance in the negotiations.

It is our view that a complementary pilot that deepens our already acquired knowledge will help in understanding the changing preferences and in the preparation for a stakeholder workshop suggested by the Norwegian Ministry of Climate and Environment. This should be further planned with three issues in mind. First, as our findings show that adaptation does not receive a lot of attention and the workshop could be a helpful start in sharing knowledge to solve local dilemmas. Secondly, Tamil Nadu works closely with the Anna University in Chennai on issues related to climate change and agriculture and the workshop would also serve as a good opportunity to get acquainted with the cooperation and how the state uses scientific knowledge in its planning and implementation. Thirdly, the ICAI field work has also resulted in a list of contacts, which should be maintained and strengthened. Keeping in mind that the administration has high turnover the workshop would be good for establishing the contacts between the Ministry and Tamil Nadu, but the long term relationship building needs to have a continuous focus.

8 Appendix

Summary of literature on institutional capacity for climate adaptation. Author: Kari-Anne Isaksen

ADAPTATION AND ADAPTIVE CAPACITY

Adger et al. 2007: Assessment of adaptation practices, options, constraints and capacity (IPCC AR 4)

Adaptation to climate change takes place through adjustments to reduce vulnerability or enhance resilient in response to observed or expected changes in climate and extreme weather events. Adaptive capacity is defined as "the ability or potential of a system to respond successfully to climate variability and change, and include adjustments in both behavior and in resources and technologies" (Adger et al. 2007:272). The capacity to adapt is dynamic and influenced by economic and natural resources, social networks, institutions and governance, human resources and technology. Much of the current understanding of adaptive capacity comes from vulnerability assessments. It is found that some dimensions of adaptive capacity are generic, while others are specific to particular climate change impacts. The authors argue that an emerging literature on the institutional requirements for adaptation suggests that there is an important role of public policy for adaptation to climate change.

Moser and Ekstrom, 2010. A framework to diagnose barriers to climate change adaptation

This article presents a framework to identify barriers to climate with three sets of components: (1) a staged depiction of an idealized, rational approach to adaptation decision-making, (2) a set of interconnected structural elements including actors, the larger context in which they function and the object on which they act, and (3) a simple matrix to help locate points of intervention to overcome given barriers. By identifying barriers one might get the opportunity to better allocate resources and build adaptive capacity.

Jones et al. 2010: Towards a characterization of adaptive capacity: a framework for analyzing adaptive capacity at the local level

The authors outline the framework 'Local Adaptive Capacity Framework' (LAC), which is developed as part of the Africa Climate Change Resilience Alliance (ACCRA) programme. Based on findings during ACCRA's consultative process, they identify five characteristics that are conductive to adaptive capacity: (1) the asset base, (2) institutions and entitlements, (3) knowledge and information, (4) innovation and (5) flexible forward-looking decision-making.

Institutions and entitlement contribute to high adaptive capacity when an appropriate and evolving institutional environment allows fair access and entitlement to key assets and capitals

exists. Adaptive capacity is socially differentiated along lines of age, gender, class and ethnicity, and institutions play an important role in ensuring equitable access to resources that can promote adaptive capacity. One should therefore assess how institutions empower and disempower people: which individuals, groups and communities have the right to be heard? Whose interests influences? In terms of decision-making it is important that the system is able to anticipate, incorporate and respond to changes with regards to its governance structures and future planning.

Adger et al. 2005. Successful adaptation to climate change across scales

The authors review the nature of adaptation and the implications of different spatial scales for adaptation processes. Adaptation is understood both as building adaptive capacity and implementing adaptation decisions, and it is a continuous process. There are three cornerstones of adaptation: (1) reduce the sensitivity of the system to climate change, (2) alter the exposure of the system to climate change, and (3) increase the resilience of the system to cope with changes. All these dimensions can be implemented at any scale.

Adaptation actions are undertaken with different objectives. Defining success simply in terms of the effectiveness in meeting the objectives is not enough, because an adaptation action might impose negative externalities at other temporal or spatial scales or for other's adaptive capacity. The authors outline a set of normative criteria judging the success of adaptation at different scales: effectiveness, efficiency, equity and legitimacy. The degree of success critically depends on the capacity to adapt and the distribution of that capacity. The relative importance of success criteria is contested and will vary over time.

Three major lessons from the literature on cross-scale dynamics for implementing adaptation are highlighted: (1) the issue of adaptation can become crucible for amplifying existing conflicts over objectives between private and public agents; (2) the institutional interactions in adaptation to climate change at different scales are not neutral pattern dependent on the physical risks. Rather, they are the outcome of interactions between the benefits of actions and the costs of inaction. And (3) adaptation across scales in ecological systems adds complexity.

Smit and Wandel 2006: Adaptation, adaptive capacity and vulnerability

This article reviews the concept of adaptation from various fields and finds that adaptation in human communities is closely associated with, and reflective of, adaptive capacity and vulnerability. Vulnerability is related to both differential exposure and sensitivity of communities. Regarding studies of implementation of adaptation, success is found when measures that address climate change risks are incorporated into existing decisions structures relating to risk management, land use planning, livelihood enhancements, water and other resource, management systems, development initiatives etc.

Smit and Pilifosova: Adaptation to Climate Change in the Context of Sustainable Development and Equity

This paper discusses adaptation and adaptive capacity broadly. It is argued that climate adaptation and equity goals can be jointly pursued by initiatives that promote the welfare of the poorest members of society, and inclusion of climatic risks in the design and implementation of development initiatives is necessary to reduce vulnerability and enhance sustainability. Interestingly the paper also looks into public adaptation decisions, and finds that public adaptation strategies frequently are forms of risk management. Some studies

demonstrate the ineffectiveness of reactive crisis management approaches and the need for proactive and cooperative planning. When discussing determinants of adaptive capacity the following features are mentioned: economic resources, technology, infrastructure, information and skills, institutions and equity.

INSTITUTIONAL CAPACITY

Blomquist and Ostrom 1985: Institutional Capacity and Resolution of a Commons Dilemma

This paper highlights the role of institutional arrangements used in the management of the West Basin as a case of a solution to a commons dilemma situation. The water management system of the West basin was designed primarily by the water producers themselves, but public institutions and officials were involved. The ability to use, create, and alter public institutions were important for the formulation and implementation of the actions agreed upon by the local producers. The authors use and build upon Lewis and Cowens' "resolution without institutions" approach. According to that approach an outcome rests upon five necessary conditions: information, communication, symmetry, enforcement, and monitoring. Blomquist and Ostrom add the institutional dimensions.

Fukuda-Parr et al. 2002. Capacity for Development. New Solutions to Old problems. Executive Summary

This article evaluates how capacity development has been understood within the development sphere. Capacity can be defined, simply, as the ability to perform functions, solve problems, and set and achieve objectives. As countries transform, they have to develop different capabilities, and new challenges demand new types of capabilities. It is emphasized that national capacity is not just the sum of individual capacity, since capacity development takes place not just in individuals, but also between them, in the institutions and the networks they create.

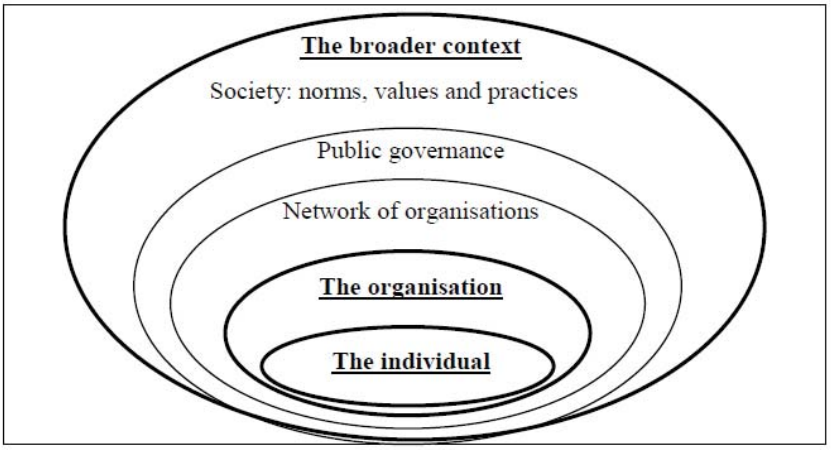
It is argued that the role of local knowledge, institutions and social capital has been underestimated in the process of economic and social development and that this should be addressed in order for capacity development to be successful in the future. They suggest that the nature of capacity development and capacity development at different levels - individual skills, institutions and societal capacities – should be investigated further. The nature of knowledge, where it is located and how it can or cannot be transferred and shared, should also be studied more.

OECD 2003: Institutional Capacity and Climate Actions

The paper thrust that an institutional approach, based on capacity assessment, could provide useful insight on national level capacity for mitigation. It is emphasized that a country's capacity stems more from the interrelationships within a country's institutional system, rather than from particular elements of that system. The concept of institutional capacity has evolved over the last years; from focus on strengthen individual organizations and providing technical and management training to support integrated planning and decision-making process between institutions. Today, institutional capacity often implies a broader focus on empowerment, social capital, and an enabling environment, as well as the culture, values and

power relations that have an impact on us.

Figure 1: a holistic view of institutional capacity



Source: adapted from Segnestam & al., 2002

Table 1: Climate-specific and climate-relevant capacity needs

	Climate-specific capacity	Climate-relevant capacity
Individuals	Sufficient government staff, experts, business and NGO representatives for the national assessment, the formulation of the national strategy, the design and implementation of climate-specific policies and measures, as well as for monitoring, reporting and review. Reasonable level of climate-specific skills and training Interest in climate change issues	Sufficient government and non-government experts developing climate-relevant policies in: energy, transport, agriculture, forestry, industry, R&D, economy, finances, education. General training opportunities Financial/non-financial incentives
Organisations	Specific mandate on climate change Climate "unit" within an organization Higher management "championing" climate change	Compatibility of other mandates of the organization with climate objectives, overall management structure and processes, level of human and financial resources, overall ability to fulfil missions
Network of organisations	Procedures and financial provisions, level of co-operation on climate issues, leadership of an organization, allocation of responsibilities, stability/adaptability of the institutional framework	Underlying public sector practices and procedures for policy integration
Public governance	Ability to influence mainstream policy-making in taking into account the climate change issue	Political stability, voice and accountability; ability to implement sound climate-relevant policies and to provide a sound business environment, civil service independence, ability to collect sufficient resources; rule of law and control of corruption
Social norms, values, practices	Knowledge about climate change and positive attitude towards climate mitigation measures	Acceptance of laws; positive attitude toward environmental protection, attitude of co-operation among citizens

INSTITUTIONAL CAPACITY FOR CLIMATE ADAPTATION

National level:

WRI 2012: Ready or Not. Assessing Institutional Aspects of National Capacity for Climate Change Adaptation

WRI has designed the National Adaptive Capacity (NAC) framework, for national-level government policy-making on adaptation. The NAC framework evaluates national institutions' performance on five key functions: assessment, prioritizing, coordination, information management and climate risk management.

Based on three pilots in Nepal, Bolivia and Ireland, WRI argues that the framework can be used for: (1) developing indicators for baseline setting and monitoring, (2) catalysing action to fill performance gap, (3) gathering and synthesizing evidence and (4) meeting needs of different users. It was also found that the role of prioritization needs to be conceptualised further. The concept of coordination might also need more flexibility in order to account for the large diversity of institutional arrangements in different countries. Moreover, climate risk management is a different function than the four other, and it needs to be elaborated on how the four firsts relate to the fifth. It is argued that NAC alone cannot answer how national-level capacity translates to implementation of adaptation activities at the local level. There is a need to explore linkages between national-level institutional functions and adaptation action at subnational level.

Local level:

Agrawal 2008: The Role of Local Institutions in Adaptation to Climate Change

This paper suggests that adaptation to climate change is inevitably local and that institutions influence adaptation and climate vulnerability in three critical ways: (1) they structure impacts and vulnerability, (2) they mediate between individual and collective responses to climate impacts and thereby shape outcomes of adaptation, and (3) they act as the means of delivery of external resources to facilitate adaptation, and thus govern access to such resources.

Institutions are important because climate change will affect disadvantaged social groups disproportionately - and local institutions centrally influence how different social groups gain access to and are able to use assets and resources. In addition to the capacity of single intuitions, the author emphasises institutional linkages (institutional access and institutional articulation). Based on review of literature on community institutions for resource governance and on decentralised governance more generally, the author identifies a set of relevant factors for effective local institutions: characteristics of institutions, characteristics of the context of institutions, characteristics of people served by the institutions and characteristics of the ecological context. It is argued that there is a lack of in-depth empirical and comparative analysis of adaptation and institutions, adaptive development and how institutions can facilitates this at e.g. household level.

Social Development Notes July 2008: Local Institutions and Climate Change Adaptation

This note, based on data from the UNFCCC coping strategies data base, presents many of the same findings as Agrawal (2008). It is argued that local institutions are important because adaptation is local and local institutions have previously shaped how rural residents have responded to environmental challenges. Three types of local institutions are relevant for

adaptation: civic, public and private (in their formal and informal forms). Five categories of local adaptation responses are investigated: Mobility, storage, diversification, communal pooling and market exchange. It is emphasized that institutional linkages and networks is important for adaptive capacity, e.g. linkages between households and institutions and linkages between various institutions. It is found that the most common classes of adaptation responses are diversification and communal pooling on their own, and diversification and exchange as a pair. Furthermore, a combination of civic and public institutions is most commonly facilitating adaptation. External support to local adaptation efforts has been typically in the form of information and financial support.

Agrawal and Perrin 2008: Climate Adaptation, Local Institutions, and Rural Livelihoods

This paper outlines an analytical framework (from Agrawal 2008) to view the relationship between rural institutions, adaptation and livelihoods of the rural poor. The authors apply the framework on 118 cases from the UNFCCC's local coping strategies database, and find that in nearly all cases local institutions are necessary enablers of the capacity of households and social groups to deploy adaptation practices. Civil society institutions, often in collaboration with public institutions, play an important role, while private and market institutions play a minor role for adaptation in rural areas. Based on an analysis of 18 National Adaptation Programmes of Action (NAPAs) the authors find that NAPAs put more emphasize on strengthen national institutions than local ones.

Næss et al. 2005: Institutional Adaptation to climate change: Flood responses at the municipal level in Norway

This article examines the role institutions play in response to floods in two municipalities in Norway. It looks at factors that constrain or facilitate the ability of local level institutions to undertake adaptation measures, as well as how interactions with institutions at other geographical levels have shaped the measures taken. An increasing body of literature suggests that institutional factors are crucial in adaptation. Institutions affect the social distribution of vulnerability, as well as determine the management of climate-sensitive aspects of society, and in turn, the capacity to adapt successfully. Many decisions regarding climate-induced hazards are local, but local decisions are at the same time shaped by interactions with structures at higher geographical scales that may mandate, encourage and inform actions. Interaction and power relationships within an institutional structure determine how the decision-making process develops and who has a voice in the process. Important aspects are the centralization of the policymaking, the decision-making process includes conflicting interests, and power in decision-making situations can be expressed as power by the elite to shape preferences and conceptions of a policy issue in a particular direction. From the case it is found that local institutional relations and power structures have acted as filter through which new perspectives must pass, slowing down the process of social learning.

Goldman and Riosmena 2013: Adaptive capacity in Tanzania Maasailand: Changing strategies to cope with drought in fragmented landscapes

This study examines how adaptive capacity is mediated by institutional and landscape changes. The authors argue that, as the relationship between livelihoods, landscapes, and institutions change, so do the particular entitlement bundles needed to cope. Adaptive capacity is understood as: (1) tied to entitlement and asset bundles, (2) intimately connected to formal, informal, trans-local institutions, and (3) scale dependent.

The East African pastoralists' livelihoods have traditionally been co-produced with a savanna mosaic landscape managed as a common property system by formal and informal customary institution. A decoupling has happen because of diversification and privatization of ownership. Mobility is a key coping mechanism to avoid cattle loss due to drought. However, mobility now requires large amounts of money new forms of knowledge and connections outside of customary reciprocity networks.

Van den Berg 2011. Climate Change Adaptation in Dutch Municipalities: Risk Pereceptions and Institutional Capacity

This study explores the effects of institutional capacity on local adaptation initiatives in the Netherlands. The case study demonstrates that local adaptation was determined by local contextual factors rather than past experience with flooding or expected risk. Knowledge proved to be a key element in institutional capacity for climate adaptation. It was found to be more capacity in urban municipalities where there was a greater understanding and awareness of threats of climate change and literally more hands to work on the issue.

Informal institutions:

High et al. 2005: Understanding informal institutions: Networks and communities in rural development.

By drawing upon literature on informal institutions in the new intuitional economics, networks in sociology, governance theory, the concept of social capital and the informal in management studies, this paper presents a theoretical framework for understanding informal structures in rural development in terms of networks and communities.

Institutional change has traditionally been seen as a key entry point for fostering the capacity of communities and organizations to engage positively with rural development. The authors, based on North (1990) and Ostrom (1990) define institutions as the rules, norms and strategies which shape individual and organizational behavior. Formal and informal institutions do not operate in isolation from each other – they are both part of the overall institutional architecture. Communities are understood as groups of people who are perceived in terms of a shared identity. Networks arise across boundaries of differences, and unlike communities, common interest is not assumed, but instead it is negotiated. Both networks and communities are founded in relationships of trust. The authors argue that studies of adaptive capacity should ask questions about different kinds of institutions and relationships.

Social learning and science-policy linkages:

Pelling et al. 2008: Shadow places for social learning: a relational understanding of adaptive capacity to climate change within organisations

The authors use theory from social learning and institutional aspects of multilevel environmental governance to study organizational adaptive capacity. They look at social learning and adaptive capacity within a local dairy farmers group and two supporting public sector bodies in Wales. It is argued that institutional approaches are seldom used in studies of adaptive capacity, and little research has investigated the relationship between individual learning and the underlying communication pathways and institutional constraints throughout which adaptive capacity and action are negotiated within and between organizations. The authors use the concept of 'shadow systems' to study the space of informal interaction that lies outside of but interacting with formal institutions and relationships (Stacey 1996). Furthermore, they emphasize social institutionalized learning as a part of adaptation. They

propose six pathways through which adaptive capacity can be indicated and adaptive actions operated:

Table 1. Six adaptive pathways.

Summary	Example
1 Organisational internal action The organisation takes collective action within its environment in order to facilitate adaptation to environmental changes.	The organisation changes its management structure or practice.
2 Organisational external action The organisation takes collective action to modify its relationship with the external environment, or an element of the environment itself.	The organisation changes its external communication strategy.
3 Agent-centred command and control The agent follows centrally prescribed pathways in undertaking a realignment of capacity to facilitate adaptive action.	In complying with work guidelines a manager adjusts work routines to meet performance targets.
4 Agent-centred resource management The agent unilaterally changes the selection or use of resources to undertake predetermined adaptive action.	Although no guidelines exist, a manager adjusts work routines to meet performance targets.
5 Agent-centred reflexive adaptation Learning from experience causes the actor to reassess the goals as well as the methods and resource uses that shape adaptive strategies	A manager decides that the preexisting aims of work are undermining sustainability and so changes these aims and consequent work routines.
6 Agent-centred institutional modification The agent undertakes to alter the institutional context within which it operates so as to shift the institutions which control its scope for future adaptive capacity and action.	A scientific advisor lobbies policymakers to change policy priorities.

Daniell et al. 2011: Aiding multi-level decision-making processes for climate change mitigation and adaptation

This article suggests research methods for aiding multi-level decision-making. Four examples of regionally focused multi-level case studies from diverse socio-political contexts are outlined. The authors discuss the possible advantages of informal research-supported processes, the complexity of organization processes for aiding multi-level decision-making processes and to what extent progress towards integrated regional policies for climate change aware that sustainable development can be achieved through research-supported processes.

GOVERNANCE

Dubash and Morgan 2012. Understanding the rise of the regulatory state of the South

This paper explores whether, and how, the rise of the regulatory state of the South, and its implications for processes of governance, are distinct from cases in the North. It is suggested that three aspects are important in characterizing the rise of the regulatory state in the South: (1) the presence of powerful external pressure, (2) the greater intensity of redistributive politics in settings with poor infrastructure, and (3) limited state capacity.

Tremeer 2013. Governance of Wicked Climate Adaptation Problems

Given the wicked characteristics of the climate change issue, the author investigates which theories are useful starting points for the governance of climate adaptation. Wicked problems are challenging to governance because: (1) the formulation of the problem is the problem, (2) every wicked problem can be considered a symptom of another problem, (3) wicked problems are highly resistant to solutions, and (4) wicked problems can induce wicked experiences among ambitious governance actors that aim at influencing societal problems.

Theories and concepts that focus on reflexivity, resilience, responsiveness and revitalization are discussed. These concepts address different aspects of wicked problems at the governance level. A logical step would be to try to integrate these different concepts into one theory, but the author rather suggests an approach of theoretical multiplicity. Multiple theories will continue to be needed simultaneously for dealing with the complex societal sustainability issues. Only variety beats variety, also at the theoretical level.

Van Nieuwaal et al. 2009. A state of the Art of Governance Literature on Adaptation to Climate Change. Towards a Research Agenda

This report provides an overview of governance literature on adaptation strategies, and suggests a research agenda on conceptual frameworks, assessment tools, adaptive policies and strategies and science-policy relations. The report elaborates on a broad definition of governance, which includes network, market and hierarchy - it includes both structure and process and it stresses the multilevel character. Governance is thus not primarily a matter of government. Literature on governance of adaptation from three scholarly domains – environmental studies, planning and development and public administration – are assessed, and a research agenda for each of them is outlined. A general finding is that the natural scientists dominate the field of (governance of) adaptation, and much knowledge from socials sciences has been left unused. Little attention has been paid to organizational and institutional dynamics.

Young and Lipton 2006: Adaptive Governance and Climate Change in the Tropical Highlands of Western South America

The case study shows that throughout the Andes, many of the agro-pastoral activities and decision are made and implemented on a household and community level. This level is increasingly integrated into larger formal and informal institutions by transnational linkages and market forces. The case study thus serves as an example of the interlinkages that exist among different institutional frameworks all operating within the same area.

UNDP: Executive summary. Preparing Low-emission climate-resilient development strategies

This report builds upon a series of manuals and guidebooks that UNDP has used in their work. UNDP suggests a methodology for developing national and sub-national climate policy, emphasizing building upon existing strategies and development plans and including a vast range of stakeholders and sectors throughout the assessment and implementation stage. The methodology includes five main steps: (1) Develop a multi-stakeholder planning process; (2) Prepare climate change profiles and vulnerability scenarios; (3) Identify strategic options leading to more equitable low-emission climate resilient development trajectories; (4) Identify policies and financing options to implement priority climate change actions; (5) Prepare low-emissions climate resilient development roadmap.

<u>Sub-national climate policy:</u>

(The two articles below are not very relevant to this study, but it might be important to be aware of examples of increasing attention to sub-national climate policy.)

Schreurs 2008: From the Bottom Up: Local and Subnational Climate Change Politics

This article investigates the role of subnational climate policy by presenting several cases from the within USA, the EU, Japan and China. How local governments sometimes choose to act as agenda setters, influence national government policies and the role of international networks are investigated. It is argued that local governments often show interest in developing independent climate change policies. Another critical lesson is that institutional settings matter in terms of the potential for local governments to take the initiative.

Setzer 2009: Subnational and transnational climate change governance: evidence from the state and city of São Paulo, Brazil

This paper looks at factors shaping climate policy in the city and state of São Paulo, and whether participation in transnational networks of sub-national governments is fostering action.

INDIA SPECIFIC:

Mishra et al. 2013: Sub-national actions on climate change and implications for international collaboration

This paper gives important general insight in the preparation of SAPCCs and presents a case study of SAPCCs in six states (west Bengal, Karnataka, Rajasthan, Madhya Pradesh, Orissa and Assam). It is found that a variety of institutional arrangements have emerged at the state level, ranging from Climate Change cells in nodal departments to a dedicated Department of Climate Change in the case of Gujarat. There is also a considerable variation among states in terms of the form and extent of stakeholders' participation in the process of SAPCC preparation. A common challenge for scientific assessments in India is the availability of data, and its quality, at the local level. For the formation of SAPCC, it is argued that lack of relevant strategic knowledge at the local level has been an obstacle. Most of the SAPCCs have relied on nationally conducted exercises such as the National Communication to the UNFCCC or the work done by the Indian network for Climate Change Assessment (INCCA) for scientific input.

Assam State Action Plan on Climate Change, 2012-2017

The assessment of climate change projections is based mainly on research articles, assessments by Indian Network on Comprehensive Climate Change Assessment (INCCA) and other public reports. It is argued that more knowledge is needed about the melting of glaciers in the Himalayas and the consequences for the river systems in Assam.

The vision of the Assam SAPCC is to "envisages a sustainable and climate resilient development pathway through a synergistic combination of adaptation & mitigation measures with focus on research, appropriate technology, capacity creation and governance." There are six main areas in the action plan: Sustainable livelihoods, mitigating natural disaster and crisis management, health, urban planning, energy sufficiency and efficiency and bio resources protection and sustainable management of forest and wild life. Initiatives within the six areas include strengthening institutions and capacity building. For example, within the Sustainable livelihoods area the state government of Assam intends to strengthen the role of farm

cooperatives and enhance strategic partnership between government agencies and research organizations.

For implementation of the SAPCC an institutional framework has been designed, with a task force based at the Chiefs Secretary's Office, an intermediate Steering Committee coordinated by the Department of Environment and Forest and Nodal Departments for each of the five initiatives. It is acknowledged that implementation of the SAPCC will required additional allocation of at least 10% of the budget.

Atteridge et al. 2012: Climate Policy in India: What Shapes International, National and State Policy?

Regarding state level climate policy it is argued that it has progressed under the influence of particular economic development objectives. They also points at the different institutional arrangements in the states and suggest that it might impact the direction of state climate policy.

CPR 2013: State Action Plans on Climate Change in India. Framing, processes, and drivers. A report on the round table dialogue organized by Centre for Policy Research 17 April 2013

Some key issues emerged from the discussion among state officials, researchers, representatives from donor agencies and NGOs and consultants:

- Lack of clarity of the framing of SAPCC; are they climate specific or broader sustainable development plans?
- Lack of available data on regional climate science relevant for the states.
- There is a general understanding that the central government wants the state to focus on adaptation and vulnerability. States have thus included mitigation to varying degree.
- In some cases states have included stakeholders, such as civil societies, experts and business, in the preparation process, but there were concerns of how this was finally integrated in the final document.
- Donors and consultants can play an important catalytic role in SAPCCs.
- Finance was regarded by many as bottleneck for implementing the SAPCCs.
- The formation of SAPCC represents an important start, much work remain for it to become a transformative planning exercise.

CSE 2012. Towards Climate Resilient Communities: Emerging Policies and Practices. A summary of workshop.

The workshop was attended by around 20 NGOs and civil society organizations from across India and South Asia. Some of the conclusions were that integrated planning that is coming out as a result of adaptation is good. One needs to work at the local level long enough to understand these long-scale adaptation processes. And furthermore that state and national policies should take stock of autonomous adaptation practices already taking place and acknowledge what's already happening on the ground. The main knowledge is already with people and local approach is therefore the way forward.

Jha 2011. Much ado about the States Action Plan on Climate Change; its business as usual for the government

A critique of the SAPCCs published by the Indian civil society organization Pairvi. SAPCCs are criticized for not having targets, timelines, financial implications and allocations. As well not emphasizing agriculture, food security, water and the rights of the forest dwellers.

Mandal et al. 2013. Developing Financial Strategies for Implementing the State Action Plans on Climate Change

The report focuses on ways for states to access central government funds for implementation of SAPCCs, and thus analyze various institutional arrangements for center-state disbursements of funds. It is argued that there is a lack of scientific knowledge and inadequate investment in climate science at the state level. It is also found that many SAPCCs contain cost estimates which are not robust and credible, and only a few states have identified sources of funding for their proposed actions. Moreover, it is emphasized that the focus should be on capacity building activities to ensure effective implementation of actions and independent monitoring and evaluation of activities and outputs within each state.

MoEF 2010. Summary of Discussion. National Consultation Workshop on Preparation of State Level Strategy and Action Plan on Climate Change

The workshop was attended by 150 delegates from various central ministries, state governments, climate change experts, civil society agencies and development agencies. It was agreed to develop a standard methodology for vulnerability assessment. The need to build capacity of stakeholders so that they can collate, analyze and make use of information made available by scientists and researchers was emphasized. Participants also raised the issue of financing mechanisms for implementing SAPCC, and were subsequently informed that ministries will be allocated funds for the National Missions and it was suggested to look at funding options for bilateral and multilateral agencies. The Common Framework for the development of SAPCCs was agreed upon.

Kelkar et al. 2008. Vulnerability and adaptation to climate variability and water stress in Uttarakhand State, India

This paper presents a participatory approach to investigate vulnerability and adaptive capacity to climate variability and water stress in the Lakhwar watershed in Uttarakhand, India. Mismatches between top- down policy recommendations and ground-level needs and aspirations were identified. It is difficult to reconcile a situation where there is severe lack of water and near abandonment of farming as a livelihood, with the National Water Policy (2002) which lays emphasis on the sale of water, and the right of the government or gram sabhas to sell excess water.

Vulnerability assessments:

Bhattacharya 2007. Lessons Learnt from Vulnerability and adaptation Assessment from India's First National Communication

Based on analyzing the process of vulnerability and adaptation assessments in India's first national communication it is concluded that human dimensions of vulnerability could be better assessed, and that institutional and human capacity is scarce.

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CICERO (Center for International Climate and Environmental Research - Oslo)
CICERO (Center for International Climate and Environmental Research - Oslo) was established by the Norwegian government in 1990 as a policy research foundation associated with the University of Oslo. CICERO's research and information helps to keep the Norwegian public informed about developments in climate change and climate policy.

The complexity of climate and environment problems requires global solutions and international cooperation. CICERO's multi-disciplinary research in the areas of the natural sciences, economics and politics is needed to give policy-makers the best possible information on which to base decisions affecting the Earth's climate.

The research at CICERO concentrates on:

- Chemical processes in the atmosphere
- Impacts of climate change on human society and the natural environment caused by emissions of greenhouse gases
- Domestic and international climate policy instruments
- International negotiations on environmental agreements

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