G I G A *Working Papers*

German ■ Institute of Global and Area Studies
Leibniz-Institut für Globale und Regionale Studien

GIGA Research Programme:
Power, Norms and Governance in International Relations
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**Who Drives Change?
Comparing the Evolution of Domestic Climate
Governance in India and South Africa**

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No 174   **August 2011**

GIGA Working Papers

Edited by the
GIGA German Institute of Global and Area Studies
Leibniz-Institut für Globale und Regionale Studien

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Abstract

This paper compares and contrasts the nature and scope of change in the domestic climate governance of India and South Africa between 2007 and 2010. It uses an actor-centered approach to analyze the drivers of change. An exploratory test of fit shows that the concept of "communities of practice" captures the trends and actor relations well for the South African case, while more simple networks could be identified in India. Using data from an expert survey and from semi-structured interviews, this paper finds that both countries have generally not yet surpassed the level of second-order change, or double-loop learning. Differences exist for more specific parts of climate governance. Three resulting hypotheses give conditions for the development of either communities of practice or of networks, as conceptualized in formal network analysis. They target (1) the number of participating actors, (2) the size of the scientific landscape and the degree of competition among scientists, and (3) the centrality of a governmental actor with a certain knowledge and attitude within a network.

Keywords: Climate change, governance, communities of practice, networks, India, South Africa

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1 Introduction

The analysis and explanation of policy change is one of the key topics in political science, and change is also what is needed for the effective governance of climate change. The change towards a low-carbon economy and a system that fosters adaptation to climate change presents a special challenge for the so-called BASIC countries—Brazil, India, South Africa and China—that have received a lot of attention during the last rounds of the international climate change negotiations within the United Nations Framework Convention on Climate Change (UNFCCC). These emerging economies and rising or regional powers (Nolte 2010) not only gain weight in the international political system, but also have a growing impact on ecosystems while they struggle to sustain economic growth and development. The pressure

for a change of domestic governance is on—both through international climate negotiations and from a domestic socioecological, vulnerability-centered perspective.

Four major theoretical approaches compete in the policy change literature. The advocacy coalition framework (Sabatier/Jenkins-Smith 1993; Sabatier 1999), the multiple streams model (Kingdon 1984), punctuated equilibrium theory (Baumgartner/Jones 1993), and the more large-N focused diffusion theory (Berry/Berry 1999) belong to the classics in public policy research. While the advocacy coalition framework and policy diffusion have been applied in environmental policy research with some success (for example, Litfin 2000), two major limitations to the implementation of these approaches exist.

First, they take a mostly positivist stance and therefore exclude the influence of ideas, norms, and discourse proposed by constructivists and post-positivists. The advocacy coalition approach has been explicitly criticized for this (Hajer 1995; Parsons 2000). Various contributions stress that climate change and our reactions to it are, at least partly, socially constructed, as the production of knowledge and policy overlap, and different norms, values, and discourses shape both the perception of and the reactions to climate change (for example, Pettenger 2007). These arguments are convincing, particularly because normative arguments and framing are often-used strategies in the debates about climate change.

Second, the classic frameworks on policy change focus on policy, not governance, and are thus state-centric from the outset. Such a view falls short in capturing the actions or various types of measures that actors already take across different levels and scales. The variation between national responses to climate change is increasingly coming into focus, and network approaches are gaining in popularity here (Harrison/Sundstrom 2010; Broadbent 2010). The connection between networks, learning, and change is a promising one for climate governance, as the first contributions by natural resource management scholars have shown (Olsson et al. 2006; Armitage 2008; Pahl-Wostl 2009). The intersection of governance, network-type approaches, learning, and change builds the theoretical backbone of this paper.

Comparative, comprehensive assessments of the nature of change in domestic climate governance in the BASIC countries and other major carbon emitters among developing countries—and an analysis of the actors behind it—are rare. This is particularly true for India and South Africa. Here, existing research focuses on International Relations questions and the Clean Development Mechanism (Vihma 2011; Benecke 2009), discusses emission trajectories and possibilities for mitigation (for example, Goldblatt 2010), or provides case studies of local adaptation practices (Roberts 2010). More encompassing assessments of overall climate governance do not sufficiently take networks between actor groups into account (Rajamani 2009; Dubash 2009; Koch et al. 2007).

My aim, then, is to contribute to the closing of an empirical research gap, while connecting the empirical data to current theoretical trends. To understand the nature of change and the actors behind it, I give the concept of "communities of practice" (Adler 2005; 2008) versus a basic version of social network analysis an exploratory test of fit for the cases of India and

South Africa. The paper asks three subsequent questions: Has a change in domestic climate governance taken place in India and South Africa? If so, how far-reaching is it? And, finally, who drives this change?

A series of semi-structured interviews and the results of an expert survey build the foundations for empirical analysis. The differences and similarities identified through this explorative test serve to generate hypotheses that target the number, relevance, and professional background of participating actors. This proceeding is particularly useful in cross-regional comparative studies, such as the present one, that are in particular danger of conceptual stretching (Collier/Mahon 1993). The generation of hypotheses through comparative designs is also a well-established technique in grounded theory and qualitative comparative politics (George/Bennett 2005).

I structure the paper in five sections. The first presents the theoretical framework for this study. It briefly outlines the approach of communities of practice based on Adler (2005; 2008) and contrasts it with formal network analysis. I thus take an actor-centered approach, and concentrate on the time period of 2007 to 2010. In the second section, I explain the mixed methods approach used for data collection in India and South Africa and the measurement of change, as well as comment on the case selection. The third and fourth sections present the empirical results, with the former focusing on the existence and nature of change in both countries' domestic climate governance, and the latter analyzing the actors and actor groups that drive these processes. Here, I also discuss the explanatory power of communities of practice and networks, respectively. A concluding section then sums up the main results, and generates hypotheses based on this comparison.

2   Theoretical Framework: From Networks to Communities of Practice

2.1 Communities of Practice and Cognitive Evolution

This section introduces Emmanuel Adler's (2005; 2008) cognitive evolution theory and its central category "communities of practice." Adler developed it as a communitarian approach to explain collective learning and change in IR, based on constructivist thinking. I have extensively discussed and advanced his approach with a focus on knowledge and learning elsewhere (Never 2011). Here, I restrict myself to a brief description of the main elements relevant for the empirical actor-centered analysis, and contrast them to formal network approaches in the next subsection. The empirical results will then show which of these approaches, if any, may better explain the actor constellations and change processes in India and South Africa.

Adler draws on Etienne Wenger's (1998) concept of communities of practice. Communities of practice are informal networks whose members are not only bound by the exchange of information, but by a sense of joint enterprise or a common identity. The identity slowly de-

velops through members' engagement with each other. Essentially, communities of practice are learning networks that develop and share new ideas, knowledge, and practices. Even though Adler does not use the term "trust" explicitly, members' relationships are characterized by it. Trust develops between individual members and as a group characteristic. Members of communities of practice can have diverse professional backgrounds, and cross-cut organizational and geographical boundaries, as well as levels of action (from local to international).

The function of communities of practice does not end with learning within the community. It also matters what they actually practically do and achieve. Through the process of cognitive evolution, they are important for changing the dominant political mindset and the conceptual categories or background knowledge that actors refer to. In consequence, this changes political strategies and outcomes, and thus the foundations of both domestic and global climate governance. As carriers of social structures, communities of practice connect structure and agency: they are set "where structure and agency overlap and where knowledge, power, and community intersect" (Adler 2008: 199).

Cognitive evolution refers to the process of collective learning through which communities of practice expand their influence and induce change. Collective learning here means a social process or social learning. Cognitive evolution also describes how communities of practice get established and how the new background knowledge that they produce (the shared ideas, knowledge, and practices) becomes institutionalized. This, in turn, changes social structures and the context on which governance actors base their perceptions, decisions, and actions.

Adler defines several facilitators of new background knowledge spreading and inducing change in the political arena:

a) the expansion of communities of practice,
b) the inclusion of key policymakers or other critical individuals,
c) the acceptance of new knowledge and practices by government networks, and
d) the passing of a tipping point or cognitive threshold (Adler 2005; 2008).

Several of these points indicate the relevance of power to the theory. Adler sometimes uses the rather fuzzy term "cognitive authority" to describe power, but also follows the well-established definition of Barnett and Duvall (2005) who differentiate between compulsory, structural, institutional, and discursive power. This definition is convincing because it combines a resource- and process-based perspective, as well as positivist and post-positivist dimensions.

Change, in Adler's view, includes the transformation of intersubjective structures: the transformation of the context and beliefs, values, and understanding of reality that Pahl-Wostl also defines as triple-loop learning (Pahl-Wostl 2009), and that Hall calls third-order change (Hall 1993). Single-loop learning—or first-order change—is a simple shift of strategies. Double-loop learning—or second-order change—alters underlying assumptions, goals,

and priorities, but within structural constraints (Pahl-Wostl 2009: 322). Pahl-Wostl connects triple-loop learning with informal networks to explain change in resource governance in a fruitful way. Her inclusion of feedback loops and reflexivity represents an advantage over Adler's approach. In this paper, I follow the understanding that change can have different orders or scope, and thus requires different stages of learning. Change and its measurement can, hence, not be dichotomous, but gradual—more refined, comprehensive measurement is required (see Section 3.1).

2.2   Differences and Similarities to Social Network Analysis

Generally, networks can be described as a set of ties between a set of actors that may change over time; network analysis is thus interested in relations and structures. The meaning of the ties between actors has to be clearly conceptualized in network analysis approaches. Networks can be formal or informal. Communities of practice could be understood as a certain type of informal network. Adler proposes that communities of practice can serve as an umbrella concept for other related concepts such as epistemic communities, transnational advocacy networks, or discourse coalitions, if variations in these potential subsets are allowed for (Adler 2005).

There are two broad groups of network analyses—formal or social network analysis (SNA) and more descriptive approaches—that have been criticized for using networks as a "heuristic device" (Christopoulos 2007), and for not sufficiently distinguishing between networks, networked governance, and governance (Parker 2007; Christopoulos 2007). My reflections target primarily formal SNA to avoid further "conceptual fog" (Christopoulos 2007: 481) at the nexus of networks, policy-making, and governance. SNA is primarily interested in explaining the relations between actors and network developments through structural characteristics—at the level of ties between two actors, through group structure or positional measures, and the impacts of attitudes that ego (the actor in focus) and its alters (the actors ego is related to) have. SNA is interested in what happens *inside* the network, and how this may explain the development of networks over time. Some of the metaphorical-descriptive approaches of network analysis have taken the whole network as an actor (independent variable), in order to analyze their impacts on policy (Keck/Sikkink 1998; Kahler 2009). Here, a combination of SNA with another method would be necessary to improve causal explanations. SNA incorporates non-structural characteristics of the network through actor attributes and covariates, while keeping the overall network structure. Adler's communities of practice and cognitive evolution are, ultimately, rather more interested in how the communities induce and affect change processes *outside* the network. Membership in and the structure of communities of practice matter as well here, hence the connection between structure and agency, as explained above.

Further, some of the distinctly constructivist elements that create a group characteristic separate communities of practice and SNA: namely, the "we feeling" and identity-building,

and a general sense of trust. SNA targets questions of identity and trust as well, but—if not combined with other methods—is often based on the rational-structural argument of networks being based on resource exchange and dependency (for example, Compston 2009). This conflicts somewhat with constructivist arguments, as it may (but does not have to) imply a competitive, even game-theoretical, situation within the network.

Trust in SNA is usually measured at the dyadic level between two actors, and in some studies as an expression of general trust in colleagues or in an organization as a whole (Luo 2005). Collective-level trust or the cultural element of trust have not received enough attention in SNA (Levin et al. 2004; Adler/Kwon 2002). This is a difference with communities of practice. Trust at the dyadic level relates to tie strength, and is relevant for information and knowledge exchange (Levin et al. 2004), as well as for the building of social capital (Adler/Kwon 2002). Evidence for the relevance of strong or weak ties, types of trust, and knowledge are mixed (Granovetter 1973; Levin et al. 2004). Most of these approaches start from the understanding that a specific actor within the network wants knowledge from another actor within the network (one-way), instead of allowing for the co-production of knowledge as well. The underlying understanding of learning may be slightly different here than in communities of practice, and the building of background knowledge that eventually spreads beyond communities of practice is a concept that seems to be hard to measure through quantitative-based network approaches.

Identity-building in SNA is measured through tie strength and attribute-based measures such as homophily or closure/transitivity when looking at a shared norm, for example. Since identity is a rather fluid concept, this could be a helpful addition to communities of practice and other constructivist approaches (Hafner-Burton et al. 2009). But, shared attributes of actors or affiliations do not guarantee a common identity in political science terms, so applications would have to be made with care.

Finally, SNA's understanding of power differs from the understanding of Barnett/Duvall outlined above, because it is related to structural positions *within* the network only. Centrality measures such as betweenness, and concepts such as "brokerage" and "structural holes" (Burt 1992) are relevant here. This again resembles a competitive, almost game-theoretical situation, which seems somewhat contradictory to potentially benign, constructivist concepts. While there may be an overlap between SNA and communities of practice in terms of the key individuals (which may or may not be in a central broker position), the application of a network-type approach to explain change *outside* of the network requires a more encompassing definition of power.

For the comparative assessment below, I use a basic understanding of formal network analysis that is based on structures, relational measures, and resource exchanges to explain the internal dynamics of networks.

3   Methods

3.1   A Mixed Methods Approach and the Measurement of Change

This paper uses a mixed methods approach to measure change in India's and South Africa's domestic climate governance, and to explore the actors—and their connections—behind the developments. Given my non-dichotomous understanding of change, I use a combination of three different methods: a quantitative assessment based on regulation density, as proposed by Knill et al. (2010), the results of an expert survey, and qualitative answers from a number of semi-structured interviews. In South Africa, 35 interviews were conducted between January 20 and March 13, 2010, and 30 interviews in India between October 8 and November 25, 2010. The expert judgments and the interviews also serve the identification of actors and their roles and connections. Results will be integrated in a concurrent triangulation in order to achieve higher validity (Creswell et al. 2008).

Expert judgments or surveys generate a consensus opinion on a phenomenon or problem otherwise hard to observe or analyze directly (Benoit/Wiesehomeier 2009), such as, in this paper, the nature of change and collective-learning processes. The selection of experts—and their actual expertise and authoritative knowledge—is more important than the number of participants. The validity of expert judgments can be assessed by comparing the results to existing studies. However, no such studies exist on either South Africa or India. Thus, the expertise, accounted for by setting benchmarks, provides the validity of the survey (Benoit/ Wiesehomeier 2009). In this survey, the number and quality of publications, activities, and reputation of experts served as benchmarks. These were assessed beforehand. In addition, a number of questions in the survey with regard to the participant's years of experience in the field, major events in the respective country's climate policy developments, and their projected climate change impacts completed the evaluation of the level of expertise of each participant. The conduct of the expert survey was part of a larger project and therefore contained 14 questions addressing a variety of issues. One question directly targeted communities of practice, and two questions addressed the change in the respective country's climate governance.

The number of respondents in India (10 experts) and in South Africa (13 experts) surpassed the minimum number of five experts that has been set in other expert surveys (for example, Ray 1999). Of the 13 experts in South Africa, eight are academics (both social scientists and natural scientists), four are consultants, and one has a legal background. The professional background of the Indian experts is similar: six are academics, three are experts from think tank-type NGOs, and one is a consultant.

Anonymity has been agreed on with each interviewee. Interviewees were members of the government and administration, large and transnational companies and business associations, environmental civil society groups, consultancy groups, and academia. In South Africa, 11 respondents to the expert survey were also interviewed before answering the questionnaire. The same applies to nine respondents in India. Interviews were conducted in a semi-

structured way. Notes were then coded with the mixed methods software QDA Miner, using the inductive-deductive method of content analysis proposed by Mayring (2003).

3.2 Case Selection

Case selection in comparative studies usually follows, or at least approximates, the most-similar-systems design (MSSD), the most-different-systems design (MDSD), or the method of structured, focused comparison (Landman 2009; George/Bennett 2005). In contrast, the aim of this paper is an exploratory test of fit of the concept communities of practice versus a basic version of social network analysis, and the generation of hypotheses based on the first results obtained. Further work building on the outcomes of this paper can target the identification and testing of causal relationships and should more closely approximate MSSD. Given the exploratory nature of this paper and the purposive absence of clear causal variables as yet, the following criteria for country and case selection can count as a rough approximate to a structured, focused comparison:

a) Significant and rising emissions of greenhouse gases. This implies pressure to act in mitigation.

b) Ratification of the UNFCCC and Kyoto Protocol, but no mandatory emission reductions in the first commitment period until 2012 (Non-Annex I country).

c) Similar projections concerning the impacts of climate change, and the high degree of overall vulnerability of the society. This implies pressure to act in adaptation.

d) Similar form of political system and administration (for example, democratic and federal).

e) A certain weight and activity in international climate negotiations. This should guarantee a minimum of interest in a political handling of climate change.

Despite the strong links between levels of climate governance, international climate negotiations, and international peer pressures they are treated as external constraints for the purposes of this paper.

Taking the first three conditions together, the sample includes up to ten countries: Argentina, Brazil, China, the Democratic Republic of Congo, India, Indonesia, Iran, Mexico, South Africa, and South Korea. The exact number depends on the baseline year for the measurement of emissions, the inclusion or exclusion of land-use, land-use change and forestry (LULUCF), as well as the similarity of projections about the impacts of climate change and the vulnerability of a society towards them. Only six of these countries have shown a continuous engagement in the international climate negotiation processes (ENB various years): Brazil, China, India, Indonesia, Mexico, and South Africa. China would be the only non-democratic country in this group and therefore has to be discarded. It appears useful to select countries which face a similar batch of problems both in terms of mitigation and adaption, in other words where similar governance fields are affected. This leaves us with the possible comparisons between Brazil and Indonesia, or Mexico, South Africa, and India. Brazil and Indonesia

may be special cases within the sample, due to the particular relevance of forest management and the set of instruments included in REDD.[1] For an exploratory, hypothesis-generating approach, the comparison of two cases appeared sufficient and for those two cases to come from the BASIC group appeared reasonable. Even though this is somewhat of a selection bias, Mexico was thus excluded from the comparison.

The time-period of analysis is January 2007 to December 2010, because the momentum of international climate governance, and therefore potential change in domestic climate governance, increased significantly from approximately 2006/2007 onwards. Analysis is restricted to the national level of governance and includes the big business sector only. For these reasons, the cases of this paper are India and South Africa, and, more precisely, their national level of domestic climate governance between 2007 and 2010.

4   The Development of Domestic Climate Governance and the Scope of Change

4.1   Regulation Density and other Governance Mechanisms

This part describes the main developments in India's and South Africa's domestic climate governance between 2007 and 2010, and assesses whether a change has taken placed based on the regulation density. Knill and his co-authors (2010) split regulation density into the amount of policies over time and the amount of governmental instruments—such as taxation—over time. I neglect their second dimension of measurement for policy change, regulation intensity, because it relates to the severity and the impact of the regulations. This is hard to measure since it would require an up-to-date measurement of greenhouse gas emissions, among other factors. On the one hand, regulation intensity is not easily assessed when comparative data for the countries under investigation is not fully available; on the other hand, the domestic climate policy is still very much in development in both India and South Africa. A brief overview about governance measures exceeding governmental actions will also be given.

South Africa developed its first National Climate Change Strategy of 2004 (South Africa 2004), but no concrete measures were implemented. Actual momentum only occurred from approximately 2007 onwards. It is safe to assume that the publication of the IPCC's 4th Assessment Report in early 2007 triggered a lot of global attention, from which South Africa was not exempt. In December 2007 the ruling party, the African National Congress (ANC), adopted a declaration on climate change for the first time (ANC 2007). While not a concrete policy step, this lifted climate change onto the ANC agenda and certainly raised awareness among ANC policy-makers. In July 2008 the Long-Term Mitigation Scenario was published

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1   Reducing Emissions from Deforestation and Forest Degradation (REDD) is a special area within climate governance. It is a mechanism under the UNFCCC that seeks to reduce emissions through market and financial incentives.

(LTMS 2008). The LTMS is a scientific document that lays out different possible options for mitigating South Africa's emissions. In November 2010, a Green Paper on South Africa's national climate policy was published that is supposed to become a White Paper in 2011. Following its goal to conduct an environmental fiscal reform (South Africa Treasury 2010), Treasury introduced a charge of 2 cent[2]/kwh on non-renewable electricity in 2009, a small carbon tax on new vehicles in October 2010, and published a discussion paper for the introduction of a widespread carbon tax in December 2010. These actions promise to lead towards the 34 percent emission-reduction goal (compared to the 'business-as-usual scenario' signed in the Copenhagen Accord) and to promote adaptation measures. Also, nearly all government departments at the national level now have a climate change appointee or a climate change team. With respect to business, awareness and activities are picking up, but more in terms of mitigation than of adaptation (Vogel 2009).

Some elements of energy governance are co-beneficial to climate change, and are often re-declared as part of South Africa's climate change response. The Energy Efficiency Accord of 2005 is a voluntary public–private partnership that is co-beneficial to climate protection, and the Demand-Side Management program of the parastatal electricity provider Eskom can also count as such a measure. Finally, the introduction of a renewable energy-feed in tariff (REFIT) also serves climate governance goals, but difficulties in integrating South Africa's energy and climate governance exist (Tyler 2010).

With respect to private governance, large and transnational companies are responding to the Carbon Disclosure Project (CDP) survey on companies' greenhouse gas emissions and response to climate change, with a consistently high response rate from 2007 to 2010 (CDP Reports, various years). The National Business Initiative (NBI) promotes business action on climate change and has organized a series of workshops following the National Summit on Climate Change in 2009. Several companies have started to engage in climate change projects as part of their Corporate Social Responsibility strategy, or sponsor research chairs on climate change, for instance as the mining company Exxaro has done (Exxaro 2010). The number of registered Clean Development Mechanism (CDM) projects has increased from eight projects in 2007 to 18 projects at the end of 2010 (South Africa Department of Energy 2011). The overall number of policies, strategies, and other governance initiatives has thus clearly increased between 2007 and 2010.

For the beginning of 2007, no comprehensive domestic Indian climate policy can be identified. In October 2007 the Bureau of Energy Efficiency (BEE) published a paper discussing issues of energy security and climate change, and how existing programs benefit adaptation to climate change (BEE 2007). This paper outlines that 2 percent of India's Gross Domestic Product (GDP) is already spent on measures and programs that are co-beneficial to climate governance. While this may be the case, some doubts remain as agricultural crop research

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2   One South African cent is approximately 0.1 Euro cent.

programs, for instance, would have to draw on recent local climate change impacts projections to be sound—these are not available yet.

In 2008 the National Action Plan on Climate Change (NAPCC) was published, which is composed of eight broad missions that include mitigation and adaptation, as well as research promotion. Each of these missions has been assigned to one or more ministries at the national level that are responsible for the further development of specific measures and driving the implementation processes of the missions in each of the federal states. According to almost all of my interview partners, only the National Mission on Energy Efficiency and the Solar Mission have really taken off in terms of concrete planning, financial investments, and steps towards implementation at the subnational level. Both of these missions draw on existing policies and initiatives. The energy efficiency mission, for example, includes a star rating system for appliances, and the Performance, Achieve &Trade (PAT) Scheme, which is a market-based mechanism that enables the trading of energy-saving certificates among large industries. Both measures are based on the Energy Conservation Act of 2001. The other missions under the auspices of the NAPCC were in different stages of planning and finalization as of November 2010.

In 2009 the Ministry of Environment and Forests published a document outlining 20 initiatives that are co-beneficial to climate governance (MoEF 2009). The Low-Carbon Expert Group, set up by the Planning Commission in 2010, is supposed to develop strategies and policy input for the transition to a low-carbon economy that feeds into the central government's 12th Five-year Plan (2012–2017). The submission of a report to the Planning Commission on this topic was expected to take place in March 2011. Apart from government-driven activities, the effective functioning of the CDM and the growing renewable energy business sector imply that India's approach is mainly a business-oriented one. The number of CDM projects has increased to 650 projects—only China hosts more. Indian companies also report to the CDP, but have significantly lower response rates, even though these increased from 2007 to 2010 (CDP Reports, various years).

Private governance initiatives exist as well. The two Chambers of Commerce—the Federation of Indian Chambers of Commerce and Industry(FICCI) and the Confederation of Indian Industries (CII)—both now have climate change task forces that are responsible for fostering awareness of climate change. CII has set up a Green Business Centre that promotes the development and exchange of best practices not only regarding climate change but other environmental fields as well. Like their South African counterparts, several Indian companies have started projects and support research related to climate change. Overall, the regulation density in India increased between 2007 and 2010 as well. While South Africa already had a national climate strategy by 2007, India had more policies and strategies that turned out to be co-beneficial to start with. The regulation density thus seems to be slightly higher in India, but there is hardly any difference in terms of direct, comprehensive policies and instruments targeting climate change. The increase of the regulation density in both countries

gives us sufficient reason to believe that a change has taken place between 2007 and 2010, and is, moreover, still ongoing. But it does not tell us enough about the degree or the order of change, which is expected to differ. The next section therefore scrutinizes the scope of these changes more closely.

4.2   Nature and Scope of Change: Results from Different Data Sources

The differentiation into orders of change and loop-learning, which includes the production of new background knowledge from a cognitive evolution perspective, requires a more comprehensive assessment of climate governance developments in India and South Africa. This section integrates the findings of interviews and the expert survey that target awareness, knowledge, and learning as well as actors' roles, interests, and governance actions or practices.[3]

Interviewees were asked whether something had changed in climate governance in the past two to three years, and if so, to describe what it was. In South Africa, most saw an increase in awareness and fostering a different perception of climate change as a challenge now. They emphasized that climate change was not much of a topic before, either for government or business, that people did not talk or know about it, or did not take it seriously. Some interview partners identified a rift between knowledge and practice, while others highlighted the positive examples of action, or said that people are at different points on the learning curve. The knowledge that actors have about climate change,[4] be it a basic understanding of the science and technology questions or a normative position, is not evenly distributed. Those experts and actors directly working on climate change have a good knowledge of the science and want to do something about climate change. Some governance actors outside of these circles—from government and administration, and business—share this kind of knowledge as well, but not all, and understanding of mitigation issues is generally better than those of adaptation. A member of government/administration states that "the level of consciousness of people at a key level has gone up, and even ordinary people see the impacts now. […] Awareness is picking up everywhere, but we're not at the required level yet."[5]

Members of government as well as scientists stressed that there is an increased need for scientific information and feasible solutions—both to help overcome uncertainty and to guide governance processes. In brief, there is a clear shift in awareness, perceptions, and potentially a general understanding of climate change related to new background knowledge— a parallel increase in debate among, and actions by, governance actors points towards a collective learning process.

The expert survey confirms these results. There was a nearly unanimous consensus among experts that:

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3   Since I aim for a compact summary of a large amount of data, I refrain from the extensive quoting of interviews.

4   The results on knowledge and awareness are bases on both experts' assessment of other governance actors' knowledge, and an interpretation of experts' own knowledge by the author.

5   Interview with Government/Administration 1, 27/01/2010, Pretoria.

— the general attitude towards climate change,

— the self-understanding (role) of South Africa,

— the definition of actors' interests relating to climate change questions, and

— South Africa's position in international negotiations changed between 2007 and 2010.

There was only one deviant opinion concerning the definition of actors' interest. The consensus of experts saw a change happening from about 2007 onwards, with acceleration in the run-up to the Copenhagen conference in December 2009. The publication of the Fourth Assessment Report of the IPCC, the ANC declaration in Polokwane, and the LTMS process counted as milestones for this process of change.

All but one expert on India also agreed that

— a change is taking place concerning the general attitude towards climate change. For

— the definition of actors' interests and

— India's self-understanding, 70 percent of experts saw a change, and 30 percent did not.

Concerning a change in India's position in international climate negotiations, ratings were evenly split between "yes" and "no." These results imply that only some actors changed their positions, and that it is not yet clear how deep the ongoing shift is and what areas of climate governance it affects. In the open-ended section of the survey question that asked to give a year, event, or months since when the observed changes occurred, some experts wrote that changes were so gradual that clearly identifying a turning point was hardly possible. Most agreed, however, that the change occurred in the last two to three years, or from about 2008 onwards. Milestones in the development of India's climate governance included the NAPCC process and the Indian government's promise to reduce emission intensity, as well as some natural disasters and weather phenomena that increased awareness (for example, floods and monsoon changes). Several experts identified the appointment of Jairam Ramesh as Minister of the Environment and Forests, in May 2009, as a key turning point.

Interview partners in India agreed that, generally, awareness and knowledge have increased in the past few years, citing particularly that the business angle to climate change is "really the buzz since 2007, and even stronger since 2009."[6] Moreover, an interview partner from the private sector said that business has learnt now that there are risks attached to climate change that they have to deal with in their company.[7] As in South Africa, the knowledge about climate change in India is unevenly spread, and the learning process is at different stages as well, depending on the actors, their (business) interests, and—to a lesser extent—their location (national or state/local). There is a lack of knowledge on some issues, particularly adaptation. According to most interview partners, a lot of contestation is ongoing about if, what, and how to do something about climate change. The levels of confusion

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6   Interview with NGO 3, 18/10/2010, Delhi.

7   Interview with Business 2, 12/10/2010, Delhi.

and insecurity among governance actors and the interviewed experts themselves were quite high. Those actors working closely on climate change have started to develop new background knowledge, but this is not shared across actor groups, so that no widely distributed, intersubjective background knowledge of the different dimensions has yet come about.

Business associations and big business show signs of collective learning, at least partly, as they not only learn individually within their own company, but through their peers as well. The same applies to parts of central government. In general, the reformulation of strategies and policy papers as well as the ongoing shift in positions gives us sufficient reason to believe in at least a single-loop learning process taking place. In some areas—such as energy efficiency, solar energy, and CDM—a double-loop learning process has occurred. This is supported by the higher regulation density in these fields as well. For cognitive evolution, this means that the cognitive threshold required for the widespread institutionalization of new background knowledge has not yet been passed.

For South Africa, the results indicate that a collective-learning process has occurred for only some governance actors, but a desire for learning and orientation—and potentially new background knowledge—exists. The nature of change includes new knowledge, debates, and the challenging of underlying perceptions, as well as the interests and first actions of some governance actors. This implies at least a double-loop learning process, giving rise to new governance measures and thought processes across society. Whether a triple-loop learning process is taking place remains to be seen, as it depends on the implementation of the measures that are being developed. When comparing the change processes in both countries, South Africa seems to be further along in the production of new background knowledge, but India is more successful in those parts of climate governance that serve business interests. The following analysis of the actors behind these change processes will shed some light on the reasons for this.

5   The Driving Capacity of Specific Actor Groups

5.1   South Africa

The point of departure between this section on South Africa and the following part on India is the concept of communities of practice. The expert judgments targeted communities of practice only, and did not ask questions that would produce data usable in a formal network analysis. The semi-structured interviews contained more open questions suitable for an open identification of relevant actors.

In the expert survey, a short description of the concept and core features of communities of practice was given before experts were asked to choose one of three statements that most closely reflected the current situation in their country. The South African expert judgments were almost evenly split between those who do identify communities of practice but attribute a lack of power to them, and those experts who see their number and power growing,

with an influence on change processes (46 percent versus 54 percent respectively). Some experts who chose the former statement commented that, in spite of their choice, they nevertheless saw a tendency towards a growth of communities of practice and their power. This split of opinion already shows that power is a critical issue.

The following interview questions targeted the identification of communities of practice and other networks: "Who are the most important actors in climate governance in your country? Who do you collaborate or exchange with on climate change questions and practices? Are these contacts personal and regular or not? How would you describe these exchanges? Do you feel that you are engaging for the same thing/are on the same page?" Additionally, at the end of the interview, each interviewee was asked to recommend other key people in the field worth interviewing. Thus, the technique used to identify communities of practice approximated the interview and snowballing methods also used in social network analysis (Wasserman/Faust 2008).

In South Africa, the number of actors working on climate change issues at the national level is rather limited. The data obtained made clear that the number of key actors actually pushing for climate governance at the national level amounts to around 15–25 people only. The information gained in the interviews strongly supported the existence of communities of practice and enabled their identification. There are (at least) three communities of practice, and many members having links to the transnational and international levels. These links may have the form of resource exchange-based networks or communities of practice.

Communities of practice revolve around the Department of Environmental Affairs (DEA) and—to a lesser extent—the Department of Science and Technology (DST). Another community of practice involves the Department of Energy (DoE) and the two major greenhouse gas-emitting companies, Eskom and Sasol. The academics (both natural and social scientists) form an epistemic community as a specific type of community of practice. They split into different communities of practice when it comes to their interactions outside of the purely scientific realm. Some are members of South Africa's delegation at the international negotiations, and some form a part of the transnational epistemic community IPCC, thus connecting domestic and global governance.

The Council for Scientific and Industrial Research (CSIR) has a significant input into the DEA climate change team and works closely with the DST as well. Two of the CSIR researchers have been repeatedly cited as key people in the interviews, and one of them belongs to the transnational community of the IPCC. The climatological knowledge exchange—and development of measures based on it—is complemented by the input of researchers from the University of Cape Town (UCT), most notably a scientist of the Climate Systems Analysis Group, who take part in the IPCC as well. Another research group of the UCT, the Energy Research Centre, works on energy and climate questions and tries to present different mechanisms to the Department of Energy. Along with a member of the non-governmental organization SouthSouthNorth, an ERC researcher mainly drove the LTMS process. Thus, they

build another community of practice along with the DoE and researchers from the South African Energy Research Institute (SANERI).

The community of practice around the DEA also contains scientists who are more concerned with adaptation to the impacts of climate change—these are, primarily, one researcher at the South African National Biodiversity Institute (SANBI), and, in terms of risk-management strategies, a researcher at the University of Witwatersrand (Wits).

Within the DEA, the number of staff working on climate change is fairly small. Relations among team members, and between team members and advising scientists, were repeatedly described as "very personal," "friendly," or "close,"[8] thus pointing towards relationships of trust and even towards a "we feeling." One interviewee from the DEA described the climate-governance landscape in South Africa as being driven by a small circle that functions "almost like a closed club."[9] There are two key individuals within the DEA who take part in international climate negotiations and who drive the domestic policy processes as well, thereby connecting levels of action. Additionally, Marthinus van Schalkwyk, former Minister of the Environment, was repeatedly cited as a key figure for lifting climate change onto the government's agenda. This shows that critical individuals are important for the influence of communities of practice. However, the DEA counts as a department with limited power as compared to other ministries, in turn also limiting the power of the community of practice around the DEA.

In terms of environmental NGOs, the community of practice around the DEA has its most influential members within a transnational organization, the WWF, and, to a lesser extent, among the individuals of Earthlife Africa and the Climate Action Partnership (CAP). Whether the latter belong to the core of the community of practice is difficult to tell since the exact knowledge and learning processes are impossible to trace (without extensive participant observation). The final members of this community of practice are two key individuals of the NBI. Several of the companies interviewed indicated a community of practice-type link with international peers in business associations: they exchange knowledge and best practices, learn together, and stimulate each other to take action.[10] These transnational communities of practice overlap somewhat with domestic ones in the private sector, indicating that drawing a line between the international and the domestic/local is somewhat counterproductive.

The third community of practice entails the closely collaborating climate change teams of Eskom and Sasol. A formal community of practice may come about in the future.[11] Since both companies, especially Eskom, are not particularly homogeneous entities, it is not clear as to

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8   Interviews with Government 3, 15/02/2010, Pretoria; Expert 3, 02/03/2010, Cape Town; Expert 5, 20/01/2010, Johannesburg.

9   Interview with Government 3.

10 Interviews with, for example, Business 4, 03/02/2010, Pretoria; Business 6, 03/03/2010, Cape Town; Business 7, 04/03/2010, Cape Town.

11 Interview with Business 3, 05/02/2010, Johannesburg.

which parts, and to what extent, entertain ties with the DoE. Moreover, some individuals and units in the companies and the DoE advocate *against* climate protection—or for nuclear energy—while the climate change teams and other parts of the DoE favor renewable energy and greater climate protection. Various interview partners emphasized that Eskom and Sasol are very close to the DoE, indicating a community of practice-type link in any case. Generally, Eskom, Sasol, and the DoE have a strong influence on the energy components of climate governance. Eskom and Sasol are also members of the NBI.

A detailed analysis of the knowledge and practices generated within these communities, and those outside of the communities of practice, to trace cognitive evolution goes beyond the scope of this paper. Yet, this description of the driving actor communities underlines the importance of power (and the lack of it), and of key figures within communities of practice for their influence and the collective learning process that supports climate governance. In sum, the concept of communities of practice is well-suited to capture the actor relations and their relevance for South Africa's changing climate governance.

5.2 India

Compared to South Africa, the number of actors operating at the national level is much higher in India. However, relations between actors and their positions are not as clear-cut. Interview partners also highlighted that there is strong disagreement between actors and actors groups on what to do, and how, in climate governance. This relates to a fragmentation of the science landscape and, to a certain extent, a fragmentation of civil society. While most interviewees affirmed the existence of some sort of networks between governance actors, these are not just a handful of small, clearly identifiable circles, as in South Africa. The formation of actor constellations, networks, and—potentially—communities of practice seems to be still very much in flux. One expert described the situation as "confusing,"[12] while another summarized it this way:

> "In the next few years we'll see what the actor networks really are that put policies into place, push for stuff to happen, it's so much under development still, I wouldn't be able to tell at the moment."[13]

Yet, several interview partners from civil society and with academic/expert backgrounds stated that if they or another researcher has influence on government and governance processes, then it is because of informal, trust-based relationships, or in an ad hoc way.

In the expert survey, two thirds of experts (70 percent) chose the second statement confirming the existence of communities of practice and attesting to their insufficient power, and one third of experts (30 percent) saw an increase in both the existence and the power of communities of practice in India. Compared to the results for South Africa, a lack of power

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12 Interview with Academic/Expert 9, 19/11/2010, Mumbai.

13 Interview with NGO 1, 13/10/2010, Delhi.

seems even more relevant here, if communities of practice can be identified through the qualitative data as well. Let us look now at the information retrieved from the interviews in more detail.

First, the change in staff at the Ministry of the Environment and Forests (MoEF) allowed the influence of a group of bureaucrats and ex-bureaucrats who dominated Indian climate policy for many years to diminish. Key figures here were Nitin Desai, Prodipto Ghosh, C. Dasgupta, and the former international chief negotiator, Shyam Saran. Also, the influence of The Energy and Resources Institute (TERI) used to be stronger. Desai and Dasgupta are now Fellows at TERI, and Ghosh is now head of the climate change team of FICCI. It can be assumed that they built a community of practice before the shift, but, as noted, that time period before 2007 is not the focus of this study.

The Prime Minister's Council on Climate Change, set up in 2008, has been important for the draft of the NAPCC, but lost some of its importance soon after its publication. Some interview partners said they were not sure whether the council still really exists, while others spoke of a devaluation of its role or even a disconnect from actual climate governance processes. This was attributed to the strong role of Ramesh and his new team of advisers, and the establishment of the Low-Carbon Expert Group.

Whether the Low-Carbon Expert Group can count as a community of practice is unclear—it may be true for parts of the group, but a "we feeling" or identity-building for the whole group of 26 experts is uncertain. Trust seems to exist more at the dyadic level, and within subgroups. Members identified a like-mindedness in the group, meaning a climate change-perspective on even economic or technical aspects.[14] The group split up into different teams targeting specific questions and chapters for the report to the Planning Commission. A higher degree of agreement exists among these teams, but the chapters at the draft stage reflected very different ideas, because each team had its own opinions and strategies.

The fragmentation of the scientific community in India leads to the question of whether there is one or more epistemic communities, or other communities of practice that include scientists or not. Given that there are over 120 institutions concerned with research on climate change (India DST 2010), an exhaustive answer to this question cannot be given here. The Indian Network of Climate Change Assessment (INCCA) consists of roughly 220 scientists working on different kinds of analyses of climate change. According to the Department of Science and Technology (DST), the INCCA is a simple renaming of the National Communication Process (India DST 2010: 5). Since this is a large process with many scientists taking part, the INCCA can hardly count as a community of practice—it is a simple network, at least for the time being. Various institutes and universities cooperate, such as the different Indian Institutes of Technology and the Centre for Policy Research, but both the exact number and constitution of these networks across the scientific landscape—as well as their qualification

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14 For example, interview with Academic/Expert 3, 28/10/2010, Delhi.

as epistemic communities—could not be determined. The influence of scientists on government is often informal and ad hoc, and depends on individual people, according to the academics and experts interviewed. The influence of particular scientists may change with those in power.[15] In other policy fields, such as economics, research has a lot more influence on government and policy, and relations between scientists and government and bureaucracy are much stronger.[16]

Many leading experts, bureaucrats, or even civil society members working on climate change issues have at one point in their life worked at TERI. This shows the standing that the institute has, or at least used to have, in the field. On the one hand, interview partners pointed out that TERI is close to business and business interests because it does a lot of consultancy work for them. On the other hand, TERI's influence on climate governance seems to have diminished in recent years.[17] Ramesh and Rajendra Pachauri, director of TERI and the IPCC, are reported to have had their differences over the NAPCC prior to the Copenhagen summit. A serious fall-out followed over a controversy about the IPCC and Indian reports on the melting of the Indian Himalayan glaciers in January 2010. Ramesh called the IPCC "alarmist," while Pachauri called the MoEF report on Himalayan glaciers "voodoo science" (The Hindu/Press Trust of India 2010). Ramesh later backed Pachauri to keep his presidency of the IPCC. But the influence of Pachauri and TERI on India's domestic climate policy considerably weakened after this, which led to the cessation of communication between Ramesh and Pachauri.[18]

Concerning civil society, there is a community of practice between individuals of the WWF and the MoEF, and individuals of the Center of Science and Environment (CSE) and the MoEF, and potentially another cone between the CSE and the Ministry of New and Renewable Energy. For the latter, data could not be verified from both sides. According to some sources, Ramesh is even called "NGO Minister" by business, because he listens more to civil society than the previous minister did.[19]

Almost all interview partners identified the greater influence of big business on climate governance, but the means of influence are not clearly discernible. This is partly due to do with the way lobbying is perceived in India. Several interview partners said that lobbying as a concept does not exist openly the way it does in Europe because it has a negative image in India. Both CII and FICCI deny that they are lobbyist organizations—the president of CII said "we are not lobbyists, we are advocates"(Khandelwal 2010). A debate about lobbying has started in India, leading journalists to make a call to "take lobbying out of the closet" (Srinivasan 2010).

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15 Interview with Academic/Expert 10, 24/11/2010, Mumbai.

16 Ibid.

17 Interview with NGO 3, 18/10/2010, Delhi.

18 Interview with Embassy 1, 05/11/2010, Delhi.

19 Ibid.

Other governance fields such as industry or economic governance may be of higher interest to big corporate groups such as the Tata Group and Reliance—relations between Tata, Reliance, and the central government are said to be very close, even though hard evidence on their relationships is not available. There are networks, and potentially different communities of practice between pro-climate protection parts of CII, FICCI, single leading companies, and the MoEF, including support for voluntary commitments under the CDM/Kyoto Protocol. There are also networks of those advocating for the opposite—the protection of economic growth interests under all circumstances. Members of the CII, FICCI, single companies, individuals at the Ministry of Industry, and at the Ministry of Power also form a network, and could form another community of practice. Ghosh, the head of the climate change task force of FICCI, stands more for the old course of Indian climate policy—reflected in his former position in the Indian climate negotiations team. There are also networks between wind energy companies, such as Suzlon, and the Ministry of Renewable Energy, but whether these form communities of practice is unclear. The exact membership of these networks in terms of individuals, and whether these networks qualify as communities of practice, could not be determined as data on the relationships remained fuzzy. Content analysis of the interviews indicates more relationships based on resource exchange-based networks in the business sector than identity-building communities based on group and dyadic level trust.

In sum, business appears to be a stronger driving force than science is in Indian domestic climate governance, while the latter is, nevertheless, not excluded. Despite the existence of, and the large amount of activities by, environmental civil society at the national level, they do not have significant influence on governance. While a number of influential networks exist, the identification and existence of communities of practice that drive change was only possible in a limited way.

6 Conclusion

This paper compared the development and the nature of change in the domestic climate governance of India and South Africa, as well as the actors responsible for these developments. While the focus was primarily empirical, the potential of the communities of practice concept compared to more simple, resourceexchange-based networks of formal network analysis or SNA were given an exploratory test of fit.

In both countries, a change in domestic climate governance took place between 2007 and 2010 and is still ongoing at the national level. The regulation density has increased in both countries, with India a step ahead in terms of regulation in energy efficiency and renewable energy. For India, the results indicate at least single-loop learning, or a simple shift in strategies, and in some areas double-loop learning—the change of underlying assumptions within structural constraints. In South Africa, at least double-loop learning has occurred, with the potential for triple-loop learning too, meaning the change of intersubjective structures, but a

final assessment of the change process depends on the implementation of governance measures. Here, India has overtaken South Africa in energy efficiency and renewable energy, but the implementation of measures remains a challenge in both countries, especially concerning adaptation to climate change.

The analysis of actors driving these developments has shown that there are (at least) three communities of practice in South Africa, with a strong input from science, while the evidence for communities of practice in India is unclear. Here, there exist more resource exchange-oriented networks that could more closely fit a SNA understanding, with the stronger influence of business on climate governance. Key individuals (such as van Schalkwyk in South Africa or Ramesh in India) are important in both cases. Based on the differences and similarities between the Indian and the South African cases, the following hypotheses result:

— The number of actors participating in domestic climate governance at the national level matters for the formation and influence of communities of practice. A limited number of actors increases the chance for communities of practice to form and cognitive evolution processes to be triggered.

— The size of the scientific landscape and the degree of competition among scientists impacts the nature of change occurring in climate governance. A smaller number of scientists and a low degree of competition among them increases their influence on government.

— If at least one key figure within a community of practice or a network comes from part of government, the chances for a higher order change increase. In SNA terms: the more central an actor with certain attributes (government member, knowledge of climate change, wanting to do something), the more likely that the number of actors in the network and the density of the network increases.

These hypotheses serve as a point of departure for future work on both communities of practice and formal network analysis, as well as climate governance. They should now be tested on other cases. The combination of formal network analysis and communities of practice can be fruitful in some cases, but mixing without the careful consideration of its implications is not advisable, especially when longitudinal analyses are considered. As deduced from this comparison of India and South Africa, a community of practice-type approach seems more suitable for explaining the impact of certain actor constellations—and the development of collective learning processes that leads to far-reaching change—than formal network analysis, interested only in structures, does.

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