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India's Carbon Governance: The Clean Development Mechanism

Maria da Graça Canto Moniz*[1]

[1] University of Coimbra, School of Law

* Corresponding author: *gracacantomoniz@live.com.pt*

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Abstract

Carbon Governance systems – institutional arrangements in place for mitigating greenhouse gas emissions – are different in emerging countries. Indeed, carbon is the same everywhere but Carbon Governance isn't: in Brazil, the financial community is actively interested in carbon trading, but Chinese banks have hardly any interest in it; and while the Chinese government takes an active interest in providing capacity to project developers, the Brazilian authorities see their role uniquely as guarantors of environmental integrity of emissions reductions projects. In the case of India, carbon governance offers specific features of patterns and interactions mostly because India strongly developed the Clean Development Mechanism and its market. This article proposes a study to the research and understanding of how exactly carbon governance works in the Indian case, knowing that India is the second largest host of CDM projects.

Introduction

The catastrophic consequences of climate change[1] pose ecological and humanitarian challenges on an unprecedented scale. In the international, regional and national levels, different structures of governance are emerging. The market-based Clean Development Mechanism (CDM) is an excellent example of an international regime, which is implemented at national level (mostly by the private sector). The CDM allows emission reduction projects in developing countries to earn certified emission reduction (CER) credits, each equivalent to one ton of CO_2. These CERs can be traded and sold, and used by industrialised countries to meet a part of their reduction targets under the Kyoto Protocol. The mechanism stimulates sustainable development and emission reductions, while giving industrialised countries some flexibility in how they meet their emission reduction limitation targets. As some academics argue, the Kyoto Protocol[2] and the United Nations Framework Convention on Climate Change (UNFCCC) were doomed to face difficulties ab initio.[3] First, there is an institutional and systematic problem. In recent years, many have questioned whether the UNFCCC is, in fact, the best and most effective forum for mobilising a global response to climate change. International efforts to negotiate a treaty on climate change have been "producing diminishing returns for some time".[4] The near disaster of the Conference of the Parties-15,[5] in Copenhagen, demonstrates that the current approach to negotiating a comprehensive, universal, and legally binding global agreement on climate change is unlikely to succeed. Secondly, the substantive problem, international climate policy, as it has been understood and practiced by many governments under

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the Kyoto Protocol approach has failed to produce any discernible real world reductions in emissions of greenhouse gases since the mid 1990's.[6]

In order for a future global climate change agreement to be successful, emerging economies such as China[7] and India must rapidly indicate that they areready to play their part.[8] In this context, with the international framework for ongoing climate change action being under discussion, it is the appropriate time to consider this model of governance and to identify its application in countries with a special role in the climate change action. One of those is India, the second largest host of CDM projects.[9]

On the international level, India ratified the UNFCCC, in June 1992, followed by the Kyoto Protocol in August. Also, after signing the Copenhagen Accord, India has assumed a voluntary commitment to cut its carbon intensity which has been established by the Indian Chamber of Commerce[10] that believed there is a huge scope for the large-scale registration of projects within both the energy efficiency and the renewable energy sectors. India set a voluntary target to cut its carbon intensity, or the amount of carbon dioxide released per unit of GDP, by as much as 25 percent by 2020 from 2005 levels.[11] As some scholars mentioned, India seeks to exploit the synergies between development, energy and climate goals.[12] But it has been noted that India's stance on climate protection at both national and international levels is "dominated by underlying business interests" with carbon governance following this trend.[13] In a similar manner to China, sustainable development is a national key priority.[14] Unlike China, however, India appears less aggressive in leveraging both the policy devices and the institutional support offered by the international climate change regime in order to serve its domestic sustainable development objectives.[15] The lack of direct action to promote foreign investment and technology transference through the CDM provides one example of this.

India is on the frontline of global warming.[16] In a recent estimate, the World Bank suggests that the developing world will suffer 80 per cent of the damage from climate change despite accounting for only one third of greenhouse gases in the atmosphere.[17] India is a case in point. The country is now the fourth largest emitter of GHGs in the world and accounts for 5 per cent of global GHG flows. But with 1.1 billion people – or a population of just under one sixth the global totals – its per capita emissions are a mere 1.7 tons of carbon dioxide equivalent (CO_2), compared to 23.5 tons CO_2 per capita for the USA. It has a significant aggregate footprint with an insignificant per capita footprint. Neither fact diminishes its climate vulnerability.

Defining "Carbon Governance"

Global carbon governance is characterised by an increasing segmentation of different layers and clusters of rule-making and rule-implementing, fragmented both vertically between supranational, international, national and sub-national layers of authority (multilevel governance) and horizontally between different parallel rule-making systems maintained by different groups of actors (multi-polar governance).[18] National governments are involved in policy making at national level and linking it with international climate regime, sub-national government implement policies in many cases.

According to Biermann[19], the core of climate governance is international architecture under the United Nations Framework Convention on Climate Change and the related Kyoto Protocol. Thus, climate governance covers both adaptation to climate impacts and climate change mitigation. In this context, the institutional arrangements in place for mitigating greenhouse gas emissions are referred to as "carbon governance". Biermann defines "carbon governance" as the set of rules, policies, mechanisms and institutions developed to manage and mitigate climate change and the process of the development of rules and rule making systems to coordinate national responses to climate change.[20]

Overview of Indian Carbon Governance. Legal and policy framework

Environmental protection in India emerged as a policy issue in the 1960s and was clearly second-hand to development and growth imperatives. However, over the past few years the Indian Government has put efforts into enhancing the status of environmental and climate issues on the political agenda. Yet, this political field is still characterised by governance failure, as far as policy implementation is concerned. Like other jurisdictions, existing environmental and development policy overlapped carbon governance. For instance, the Environment Protection Act (1986) requires certain types of development projects to be approved on environmental grounds and, where applicable, this approval process may add to the complexity of a CDM project although, conversely, this process may assist in certifying its sustainability credentials.[21] It is clear that the domestic environmental protection regime affects the context in which the CDM market operates but the dominance of business interests creates a dividing line between the environmental and economic dimensions of the Indian regime. Given that poverty reduction is a national priority in India, the strength of climate change as a policy driver is likely to rank lower than other social imperatives.[22] The CDM was

designed to accommodate this situation, with the flexibility allowed within the domestic implementation provisions, seeking to accommodate national circumstances.

India's Federal Structure

In the context of carbon governance and environment federalism it is important to distinguish the different kinds of responsibilities in these matters. For instance, sectors such water, industries, agriculture and transports come under the jurisdiction of individual states, while electricity, factories, forests, wildlife and socio-economic planning fall under the purview of both Central and States.[23] India is a federal union with a legal system based on English common law, thirty-five states and territories and has several inconsistencies between national and state-level regimes, which affect the carbon governance. For instance, so far there is no overarching renewable energy law governing all states. Instead, there are separate initiatives by the central and state governments. [24]

Sub-national governments play a key role in sectors like energy, industry, transports, urban development and waste management – directly related to the "carbon governance". Further, mitigation actions implementation will also be, in most cases, at local level further highlighting the role of sub-national governments.

Nevertheless, before 2009 most environmental responsibilities were left in the hands of state and local governments, if they were addressed at all. Actually, sub-national governments did not have policies and programmes specifically on climate change though many had indirect effects on climate change mitigation and adaptation. Also, while the emerging state level actions and plans, prepared by the sub-national government are federally directed, the core of the State Action Plans on Climate Change (SAPCCs)[25] is being shaped by the priorities identified by each state government. Some initiatives target cities and local governance bodies to enhance climate actions: the "Asian Cities Climate Change Resilience Network (ACCRN)"[26], "Urban Climate Project"[27], the "Local Renewables Model Community Network"[28], the "Urban Environmental Accord".[29]

It is important to pursue the harmonisation between national and state level actions through a participatory and inclusive policy making process.[30] Inconsistency between federal and regional policies can pose barriers to investment due to a lack of clarity.[31]

National Action Plan on Climate Change (NAPCC)

The NAPCC is the prime policy document that outlines India's approach and plan to deal with climate change. It involves the establishment of eight missions or programmes on solar technology, energy efficiency, sustainable habitat, water, the Himalayan ecosystem, green India, agriculture and strategic knowledge. Four of these missions are focused on the mitigation of climate change: Jawaharlal Nehru National Solar Mission (JNNSM)[32], National Mission on Enhanced Energy Efficiency (NMEEE)[33], National Mission on Sustainable Habitat (NMSH)[34] and Green India Mission (GIM). It is important to outline, that each of the missions has a designated implementing agency at the national level, which further identifies a state nodal agency with roles to implement the missions. The National Solar Mission, for example, is being implemented by the Ministry of New and Renewable Energy.[35]

This plan establishes that India's policy response to climate change will primarily address the urgent and critical concerns of the country with co-benefits for addressing climate change through a directional shift in the development pathway, thereby assigning priority to the maintenance of high economic growth.[36] Much of the NAPCC focus is on development and adaptation but there are actions which have direct bearing to emissions mitigation, for instance the National Mission on Energy Efficiency, the National Solar Mission and the Green India. The development priorities are also stated in the interim report of the committee set up by the Government of India to help develop a low carbon strategy for inclusive growth, as an input to India's 12th five Year Plan (2013-2017).[37] It states that development objectives (decreasing poverty, improvement in quality of life, distributional justice, job creation, competitiveness, industrial growth) are affected by climate change mitigation policies and recommends that policy choices should be based on the extent of additional burden imposed on, and the benefits that accrue to different consumers and sectors of the economy.[38] Indeed, it seems that development and economic growth still remain the priorities for India.[39]

Carbon Market in India: a new segment of the service industry

The CDM – an economic mechanism that relies on market forces for its successful implementation – cannot be understood independently of the broader "carbon market" to which it belongs.[40] The carbon market is defined here as the sum of all transactions in which one or several parties pay another party or a set of parties in exchange for a given quantity of GHG emission credits. The legal definition of these credits varies, but what is important is that they are transferred from the seller to the buyer. Payments can take various forms, such as cash, equity, debt, or technology transfer.[41]

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Benecke identifies four characteristics of the Indian Carbon Market.[42] The first, already mentioned, regards concerns and discourses about the quality of Indian CDM projects and the effectiveness of the Designated National Authority DNA.[43] The second memo is that less than half of Indian CDM projects have a credit buyer. This means that only one half of Indian CDM projects are bilateral – those that have signed the letter of approval with industrialised countries. Most CDM projects in India are developed unilaterally by local stakeholders, without direct involvement of Annex I countries. This is a controversial use of the CDM which excludes the possibility for technology transfers and foreign investment.[44] In this context, Indian's carbon market is dominated by private sector participants[45] who seek to maximise profit, increase their market share, and gain a competitive advantage. In order to do so, these Indian private actors "interpret sustainability criteria and additionality tests in their favour and adapt them to respective circumstances".[46] Also, in general, it is argued that the CDM often appears to generate wrong incentives for private companies mandated to validate and ultimately certify individual projects.[47] Thirdly, most CDM projects registered in India are small-scale renewable energy and energy efficiency projects. Internationally, India holds a share of 28.1% of the total 2,747 CDM projects in the renewable energy sector. As Benecke states, "most of CDM activities take place in the biomass energy sector (…) this is followed by project activities in the wind sector (…) by activities related to energy efficiency measures in industries (…) and by projects in the hydro sector".[48] Last, but not the least, the distribution of CDM projects across India's states is not equal, with a strong bias towards more economically prosperous states, which, undoubtedly, creates uncertainties about the CDM's contribution towards sustainable development and equal distribution of national welfare aspects.

Clean Development Mechanism (CDM)

The CDM is a mechanism under the Kyoto Protocol that allows developed countries to invest in emission reductions in developing countries, which provides a cost effective alternative, to meet their goal under the Kyoto Protocol. The CDM also helps developing countries in achieving sustainable development by technology transfer and fund flows given by developed countries. Nonetheless, there is a lot of criticism in using the CDM as an expanded mechanism for the inclusion of the developing world into a post-2012 climate regime. Schneider[49] states that the CDM is an offsetting mechanism, which does not contribute to overall emission reductions. Wara and Victor argue that the CDM "rather than draw them (developing countries) into substantial limits on emissions it has, by contrast, rewarded them for avoiding exactly those commitments".[50]

The CDM is a new mode of governance to achieve climate-policy objectives. Actually, a range of actors across sectors and state levels are, together, acting both as market participants and also governing this mechanism through various levels of interaction.

As on January 2012, India ranks only second to China with over 20% (769) of the CDM projects registered globally. Major sectors include renewable energy (wind, hydro, biomass), waste management, industries-cogeneration and waste heat recovery.[51] However, literature states that "as the Indian Government regards CDM as income generation device, its policy stimulating potential is debatable".[52]

The process

UNFCCC defined very well the process of the CDM, therefore, a project must follow a life-cycle of eight stages, which involves: design, host country approval, validation, registration, implementation and financing, monitoring, verification and certification, and CERs issuance. In order to be eligible for registration as a CDM project, applications must fulfill the sustainable development indicators, which are established by the national government. The language of sustainable development is visible in this process as prospective projects need to be designed towards improving quality of life from an environmental standpoint, which is assessed by taking into consideration social, economic, environmental and technological wellbeing. However, there is a need to monitoring this process as the sustainable development of the CDM may be overshadowed by the business interests. According to Benecke, "the central values underlying the Indian state's interests and activities are to guarantee national welfare objectives and at the same time to retain the international reputation as investor friendly, integer and open country".[53]

In India, the Ministry of Environment and Forests is the Designated National Authority (DNA), which is the first screening point of the CDM projects' potential.[54] In addition, several states in India have created bodies to oversee CDM projects and there are also existing government agencies or independent bodies established by the private sector. Then, these projects are validated by a Designated Operational Entity (DOE), an independent third party auditor. After validation, CDM projects are also webhosted at the UNFCCC websites for global stakeholder comments.

The CDM Executive Board[55] then considers the project for registration, review or rejection. A verification pro-

cess is also carried out by the DOE before every issuance of carbon credits.

Conclusion: the India Carbon Market dynamics. Key challenges

The Indian carbon market is characterised "as private sector oriented yet invisibly state controlled market facilitation" under regulation of carbon governance structures.[56] As Fuhr and Lederer state, "governance should not be read as being a synonym to deregulation or a normative call for a retreat of the state".[57] However, in India, it lacks direct control at the national level and it is argued that state intervention occurs only as state interests and values are threatened, for instance, by international pressure. India's federal system provides one possible explanation for the absence of centralised control, since Indian states have jurisdiction in areas such as environment and energy, directly related to the carbon market. Besides, there is limited application of hard-steering mechanisms. This lack of control in the Indian market can be explained by philosophical reasons (market freedom and allocation) or policy goals (the intention to support entrepreneurship rather than environmental objectives).[58] The expansion of the Indian carbon market will demand political intervention mostly to create an enabling infrastructure for expansion, including provision of emissions trading infrastructures for the market's growth.[59]

However, Benecke states that as the CDM operates under multilevel governance, changes to procedure and substantial reforms can only and must take place at an international level as the international process must be able to accommodate national input effectively.[60] On the other hand, it is clear that the international climate change regime cannot hide and forget business needs within the CDM market. We understand that the CDM has shown to be a rather flexible mechanism which can evolve, adapt and improve. For instance, when the mechanism was built linking the CDM to the EU ETS, a cap-and-trade system, was not foreseen.

On the other hand, Indian businessmen (industry representatives, business operator and other investors) appear frustrated with the administrative hurdles, constraints and challenges posed by the UNFCCC Secretariat and the Executive Board. Mostly additional assessments at the international level might be a source of opposition to the expansion of the CDM in India.[61]

Cultural issues might operate to deter investors otherwise willing to participate in CDM projects as the Indian business community is reluctant to accept foreign partnerships. And pre-existing business networks may emerge as barriers to foreign participation.[62]

Technology transfer and CDM should be linked to ensure wider adoption of environmentally beneficial technologies beyond the CDM project.[63] India would like to see that a CDM project leads to real technology transfer, giving the country the ability not only to operate the technology, but also to replicate and innovate. However, in India there is a lack of direct action to promote foreign investment and technology transfer through the CDM.[64]

In conclusion, it is crucial to study interactions in the Indian CDM market as it allows empirical groundwork for practical reforms and new proposals. Also, the specific features of patterns and interactions allow the conclusion that carbon governance is not equal around the world. It could be argued that local action needs to occur in the context of collective international effort. However, the Indian tendency towards unilateral action in the Indian CDM participation obstructs the possibility of assigning common responsibilities and that affects the extent of technology transfer allowed under the CDM. Nevertheless, India is the second largest CDM host and, consequently, a substantial contribution to international mitigation efforts, under the international regime, although it could better harness external investment and frameworks to scale-up CDMs transactions.

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Conflict of Interests

The author hereby declares that there is no conflict of interests.

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1. According to article 1 of the United Nations Framework Convention on Climate Change, "climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
2. The Kyoto Protocol was born in 1997 with the goal of establishing a legally binding framework for mitigating the overall emissions of GHGs (greenhouse gases). Because of the complex and different pattern of responsibilities with regard to the creation of the problem, some countries have to do with quantified emission reduction obligations and some others do not.
3. In this matter, Dilma's Roussef opening speech at the Conference Rio+20, on the 20th of June, was clear.
4. FALKNER, Robert, HANNES, Stephan and VOGLER, John, "International Climate policy after Copenhagen: Towards a 'Building Blocks' Approach", in Global Policy, I, (2010): p. 253.
5. Briefly, the Copenhagen Accord has been criticized by environmental groups such as Friends of the Earth and carbon traders including Barclays Capital, because no binding targets were set. It calls for more talks in preparation for a treaty to respond to a global warming by capping emissions and expanding the $ 126 billion a year carbon market.
6. LEAL-ARCAS, Rafael, "Alternative Architecture for climate change: major economies", in *European Journal of Legal Studies*, Vol. 4, 1, (2011): p. 25-56. The Author proposes using the experience of trade agreements as a model for reaching a global climate treaty.
7. In 2010, CO2 emissions from China have surpassed the ones from the USA. Although, annual average increasing rates of CO2 emissions from China will decrease from 7.4% during 2000-2010 to 3.3% during 2010-2020. ONISHI, Akira and SOSA-GARCIA, Rodolfo, "Global Proposals for Energy Security and Environmental Sustainability, Galilei Consulting, Civil Society Hemispheric Forum, OAS, Miami, 1-2, 2008.
8. The Kyoto Protocol is an agreement on climate change which has proved to be very rigid in its approach to reducing GHG - article 1.5 of the UNFCCC defines greenhouse gas as "those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation". For the purposes of GHG emission reduction, the UNFCC divides the world into Annex I countries (or developed countries) and developing countries, legally binding only Annex I countries to reducing their GHG emissions by a certain deadline. Why? Because rich-countries have been the major polluters. However, it has been argued that a better and fairer way to envisage the climate change issue, nowadays, is by bringing together the major GHG emitters, irrespective of their GDP. FARBER, Daniel, "The case for climate compensation: justice to climate change victims in a complex world", in Utah Law Review, 2, (2008): p. 377.
9. Regarding November 2010, 79,615,975 Certified Emissions Reductions (CERs) have been issued for 550 CDM projects. UNFCCC, "CDM Statistics", available at, accessed 23 June, 2012.
10. Comments made by representatives from the Indian Chamber of Commerce during an official side-event at the Carbon Expo: Global Carbon Market Fair and Conference, held at the Fira de Barcelona, May 27-29, 2009.
11. SINGH, Gurav, "India Will Meet Its Copenhagen Climate Commitment, Ramesh Says", January, 2010, available at *http://cdm.unfccc.int/Statistics/index.html* accessed 23 June, 2012.
12. RAJAMANI, Lavanya, "The Indian Way: Exploring the Synergies between Development, Energy and Climate Goals', Chapter 18 in Donald N. Zilman, Catherine Redgwell, Yinka O. Omorogbe and Lila K. Barrera-Hernandez, Beyond the Carbon Economy: Energy law in Transition, (OUP 2009): p. 420 and 483.
13. BENECKE, Gadrun, "Varieties of Carbon Governance: Tacking Stock of the Local Carbon Market in India", in *The Journal of Environment and Development,* Vol. 18, issue 4, (2009): p. 350.
14. Ministry of Environment and Forests, India's Initial National Communication to the United Nations Framework Convention on Climate Change, Executive Summary, (2004): p. iii, para. 5.
15. As it is well known, there is a number of potential conflicts between economic growth and acting on climate change. It is a fairly straightforward proposition that as the economy grows, so will the GHG emissions. As such, for example, the International Energy Agency's (IEA) World Energy Model, used to derive its authoritative projections of energy demand and is based on projected economic growth as a key exogenous assumptions. However, COPELAND and TAYLOR developed a seminal mode that can be used to break down the environmental effects of economic growth into three effects: scale; composition; technique. So, according to them, the final impact of any economic growth is, ex ante, indeterminate. COPELAND B. and TAYLOR S., "North-South trade and the environment", in *Quarterly Journal of Economics*, Vol. 108, No. 3, (1994): p. 755-787; United Nations Conference on Trade and Development, Developing Country Interests in Climate Change Action and the Implications for a Post-2012 Climate Change Regime, United Nations, (2009): p. 9.
16. India should be concerned about climate change because it might have substantial adverse impacts on them. Of course, the climate change nature and extent and their impacts are uncertain however, that should not justify inaction. Also, there are three main "categories" of certain impacts: agriculture, sea level rise and increased frequency of extreme events. Nonetheless, the immediate concern for India should be the fast pace at which negotiations are taking place on the climate front. India's main energy resource is coal. With the threat of climate change, India is called upon to change its energy strategy based on coal, its most abundant resource, and to use other energy sources instead.
17. World Bank, "World Development Report 2010: Development and Climate Change", Washington DC, World Bank, 2009.
18. TERI, (The Energy and Resources Institute), "Carbon Governance at Sub-national Level in India, New Delhi: The Energy and Resources Institute, 2011, p. 5.
19. BIERMAN, Frank, PATTBERG P. and ASSELT HV., "The Fragmentation of Global Governance Architecture: a Framework for Analysis", in Global Environment Politics, Vol. 9, (2009): p. 14-40.
20. BIERMAN, Frank, "Beyond the intergovernmental regime: recent trends in global carbon governance", in *Current Opinions in Environmental Sustainability*, Vol. 2, (2010): p. 284-288.
21. Other national laws, which apply indirectly to the clean energy sector, include the Forest Conservation Act (1978), the Water (Prevention and Control of Pollution) Act (1972) and the Air (Prevention and Control Pollution) Act (1980). Baker & McKenzie/World Institute of Sustainable Energy, Identifying optimal legal framework for renewable energy in India, (November 2008): p. 4.
22. CHAPMAN, Shopie, "Assessing Good Carbon Governance in India", University of Cambridge, Good Carbon Governance Working Paper No. 4, April 20, 2011.
23. Seventh Schedule, Article 246 of the Constitution. TERI, supra note 18, p. 9.
24. Indian Renewable Energy Status Report
25. Background Report for DIREC 2010, p. 24.
26. The Prime Minister of India, Dr. Manmohan Singh alerted the States to operate State level Action Plans on Climate Change, consistent with the strategy outlined in National Action Plan on Climate Change, at the Conference of State Environment Ministers, in 2009. So, there has been an increase of policies and programs at the sub-national level. For instance, the Department of Science, Technology and Environment prepared the SAPCC for the state of Goa. The main mission/objectives include protection of coastal resources and livelihood of traditional

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inhabitants along the coast; polarization and installation of renewable energy; use and promotion energy conserving devices; stress on biodiversity maintenance, preservation and increase of the forest cover to keep the state green; promoting sustainable agricultural practices to optimal usage of the available land and to bring it under green cover. To sum up, in its action plan the state prioritizes mitigation as its objective and the missions are mostly in line with the NAPCC. Participant cities are: Surat, Indore, Gorakhpur. The objective is to catalyze attention, funding and action on building climate change resilience through active engagement and analysis for various cities.

27. Currently, taking place in Coimbatore and Rajkot. It is tapping opportunities of low-carbon development in Indian municipalities.
28. In Coimbator, Nagpur and Bhubaneshwar, is promoting renewable energy use at city level.
29. Participant cities are: Kota, Ahemdabad, Hyderabad, Delhi, Gwalior, Bhilai, Bhopal, Darbhanga, Jammu, Mysore, Calicut, Aligarh, Jamnagar, Lucknow.
30. It is interesting to note that in the European Union exists a principle (not a rule) which predetermines the activity of the Community and, as such, has legal force: the subsidiary principle. For the environment, much depends on the interpretation given to the requirement that the objective of environmental protection cannot be sufficiently achieved by Member States and can thus be better achieved at a Community level. KRAMER, Ludwig, EC Environmental Law, Thomson, (2007): p. 17.
31. Indeed, as recent financial events indicate, every economic activity is embedded in a broader social order and can only be carried out within a clearly regulatory framework. BENECKE, Gadrun, supra note 13, p. 329.
32. The focus sector is energy supply and the objective is to promote the sharing of renewable in the electricity generation mix, leading to considerable emission reductions. The mission has a 3-phase approach, envisaging deployment of 20,000 MW of solar generated power by 2022. The national implementing agency is the Ministry of New and Renewable Energy.
33. The target is expected to avoid capacity addition of 19,000 MW, leading to a reduction of around 98.55 million tons of CO2 annually. ATTERIDGE A., SRIVASTAVA M.K., PAHUJA N., "Climate Policy in India: What shapes International, National and State Policy?, in AMBIO, Vol. 41, issue 1, (2012): p. 68-77.
34. The focus sectors are building, waste and transport. It aims at ensuing sustainability in Indian cities in lieu of climate change through changes in city development plans. This mission is to be implemented through appropriate changes in the legal and regulatory framework (e.g. Building Byelaws, Development Control and Regulation, etc.).
35. National Mission on Enhanced Energy Efficiency is being implemented by the Bureau of Energy Efficiency (BEE) of the Ministry of Power and National Mission on Sustainable Habitat is being implemented by the Ministry of Urban Development.
36. Some scholars argue that whether and how we regulate climate change is not the only problem to decipher. The other issue on the table is whether our decision to regulate climate change will affect how we regulate energy. The problem is that for a long time environmental and energy regulation have been largely separated and distinct. As LINCOLN L. DAVIED explains, "can, or will, the crisis of climate change propel us to a new form of energy regulation that is integrated with the regulation of environmental protection and resources use?"."Energy Policy Today and Tomorrow – Toward Sustainability?", in *Journal of Land, Resources & Environmental Law*, Vol. 29, 1, (2009): p. 73.
37. Government of India, "Interim report of the Expert Group on Low Carbon Strategies for Inclusive Growth", Planning Commission, 2012.
38. TERI, supra note 18, p. 11.
39. Some scholars state that India should reject the conventional paradigm for energy planning according to which we are asked to think in terms of energy consumption as a necessary condition for economic growth. Thus, "the paradigm says that if we want development, then we have to have economic growth, and if we want to increase Gross Domestic Product (GDP), we must increase energy consumption". The so called Energy-GDP relationship. REDDY, Amulya Kumar N., "Development, energy and environment: alternative paradigms", Department of Management Studies, Indian Institute of Sciences, Bangalore, available at *http://www.amulya-reddy.org.in/*Publication/89to93_ET200191.pdf, accessed 23 June, 2012.
40. While command and control regulations are unable to internalize the external costs of the environment, economic instruments may help by distributing and prizing a formerly common good. Markets thus create scarcity and place limits on the use of resources to avoid further degradation of that resource. STRECK, Charlotte, "New Partnerships in Global Environmental Policy: The Clean Development Mechanism", in *Journal of Environment & Development*, Vol. 13, No. 3, (2004): p. 295-322.
41. Scholars explain that carbon transactions can be grouped into two main categories: 1. "allowance-based transactions, in which the buyer purchases emissions allowances created and allocated (or auctioned) by regulators under cap-and-trade regimes, such as Assigned Amount Units (AAUs) under the Kyoto Protocol, or EU Allowances (EUAs) under the EU-ETS" and 2. "project-based transactions, in which the buyer purchases emission credits from a project that reduces GHG emissions compared to what would have happened otherwise. Project-based transactions include CDM and JI transactions, but also non-Kyoto transactions such as voluntary transactions in Europe or in the United States (…)". LECOCQ, Franck and AMBROSI, Philippe, "The Clean Development Mechanism: History, Status, and Prospects", in *Review of Environmental Economics and Policy*, Vol. 1, No. 1, (2007): p. 134-151.
42. BENECKE, Gadrun, supra note 13, p. 349.
43. The Author mentions that "exactly 40% of the CDM projects rejected worldwide originate from India (32 CDM projects out of 87 in absolute numbers)".
44. One possible explanation for this situation is the entrepreneurial spirit of Indian private investors associated to the early successful capacity-building efforts of the international donor agencies as well as consultancies and a DNA which encourages Indian projects developers promoting CDM for business purposes.
45. We can identify three categories of private actors: project consultancies of Indian origins (Ecosecurities, Price Water Coopers, Cantor CO2e, Ernest & Young, Asia Carbon); Designated Operational Entities (the three largest in India are DNV, SGS and TUV SUD) that adapt activities to the needs of their main customers (project developers and consultancies); Financial institutions (a substantial number of foreign bank affiliations as well as national banks that have recently commenced financing CDM projects).
46. BENECKE, Gadrun, supra note 13, p. 355.
47. SCHNEIDER, L., "Is the CDM fulfilling its environmental and sustainable development objectives? An evaluation of the CDM and options for improvement", Report prepared for the WWF, Berlin, Germany, Oko-Institut, 2007.
48. BENECKE, Gadrun, supra note 13, p. 351.
49. SCHNEIDER, L., "Is the CDM fulfilling its environmental and sustainable development objectives? An evaluation of the CDM and options for improvement", Report prepared for the WWF, Berlin, Germany, Oko-Institut, 2007.
50. WARA, M., & VICTOR, D.G., "A realistic policy on international carbon offsets" (Program on Energy and Sustainable Development Working Paper No. 74), Standford, CA: Program on Energy and Sustainable Development, Standford University, (2008): p. 6.
51. TERI, supra note 18, p. 19.
52. BENECKE, Gadrun, supra note 13, p. 348.
53. Ibid., p. 354.
54. Concretely, its functions are CDM project evaluation and approval, recommendation of additional measures, financial reviews, and ensuring that sustainable development is prioritized. The integrity and effectiveness of DNA has attracted concern. Since India has the highest rate of rejections by the CDM Executive Board, the India DNA's objective to accommodate business interests in tandem with promoting sustainable development goals may need to be reviewed. Nevertheless, the administrative hurdles in the international regime can also be the cause of the sub-optimal operation of the CDM Executive Board. NEWEL, Peter and PATERSON, Mathew, Climate Capitalism: Global Warming and the Transformation of the Global Economy, CUP, (2010): p. 135.
55. The CDM Executive Board was created in 2001, during the COP 7 in Marrakech and it supervises the CDM, under the authority and guidance of the COP. During the project life-cycle the Executive Board must formally accept the projects as CDM project activities.
56. BENECKE, Gadrun, supra note 13, p. 361.
57. Ibid., p. 330.
58. As usual the conflict is between financial interests and environmental protection. ZIZEK, psychoanalyst, philosopher and teacher, sums up

the issue most clearly: "(...) but when we recognized the urgency of the issues while we were fighting AIDS, hunger, water shortages, global warming, etc.., There seemed to be always time to reflect, to postpone decisions (...) but with the financial meltdown, the urgency was unconditional financial and effectively were available from one moment to the other amounts of unimaginable proportions. Save endangered species, save the planet from global warming, saving AIDS patients and people who die from lack of resources that give them access to expensive treatments, saving starving children ... well, everything that can wait a moment more. The appeal "We must save the banks! ', By contrast, imposes itself as an unconditional imperative to immediate action (...)". See ZIZEK, Slavoj, First as Tragedy, then as Farce, Relógio D'água, (2009): p. 95

59. GHOSH, Debyani, SHUKLA P.R., GARG, Amit and RAMANA, P. Venkata, "Renewable energy technologies for the Indian power sector: mitigation and operational strategies", in *Renewable and Sustainable Energy Reviews*, Vol. 6, (2002): p. 483.
60. Ibid., p. 368.
61. JOSHI, Vijay and PATEL, Urjit R., "India and climate change mitigation", Chapter 9, in Donald N. Zillman, Catherine Redgwell, Yinka O. Omorogbe and Lila K. Barrera-Hernandez, Beyond the Carbon Economy: Energy Law in Transition, OUP, (2009): p. 192.
62. BENECKE, Gadrun, supra note 13, p. 365.
63. PARIKH, K. Jyoti and PARIKH, Kirit, "Climate Change: India's Perception, Positions, Policies and Possibilities", OECD, Climate Change and Development, (2002): p. 22
64. This approach is in Sharp contrast to its Chinese counterpart, which has a dominant control over market participation. Interestingly, however, both over-regulation and under-regulation of carbon governance structures have the same practical effect on foreign participation: the Chinese control market participation by placing restrictions on foreign investors and the dominance of Indian private sector interests may operate to exclude external interests from the marketplace. Either way, this influences the conditions for CDM investment. This indicates that the carbon governance will take on different forms in different countries. FUHR, Harald and LEDERE, Markus, "Varieties of Carbon Governance in Newly Industrializing Countries", in *Journal of Environment & Development,* Vol. 18, No. 4, (2009): p. 327-345.

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