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REGIONAL VOICES

Indian Climate Policy

Choices and Challenges

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Stimson's *Regional Voices: Transnational Challenges* project is devoted to enhancing the information and analysis available to policymakers about emerging transnational security challenges in the Middle East, South Asia, Southeast Asia, and East Africa. It seeks the direct input of experts and practitioners in the regions, especially those who constitute new voices in the conversation with the US policy community. In its work on environmental change, *Regional Voices* works with many partners in its countries of interest, including India. The project currently maintains a strong partnership with The Energy and Resources Institute (TERI), a New Delhi-based institution that works to provide environment-friendly solutions to rural energy problems; tackle global climate change issues across continents; advance solutions to growing urban transport and air pollution; and promote energy efficiency in Indian industry.

INTRODUCTION

David Michel

In order to negotiate effectively on an international regime for climate change, US policymakers must have an accurate understanding of the constraints and considerations that determine the negotiating positions of key countries. India plays a pivotal role in these efforts. In the run up to the December 2009 negotiations in Copenhagen, India has proven to be a canny negotiator, constantly seeking to balance the demands of major Western countries with the positions of the developing world. But the high stakes drama of international negotiations often leads observers to treat India as a monolithic actor with a single set of opinions and needs. The essays in this volume are intended to counter this assumption and to show the rich, diverse, and often divergent viewpoints that inform India's approach to climate change.

The Indian experts who have contributed to this volume address various aspects of the climate challenge, ranging from the risks to Indian energy security and water resources to the dynamics of greenhouse diplomacy and the opportunities and obstacles to Indian policy leadership. Despite the variety of perspectives they bring, the papers display a remarkable degree of unanimity in support of a national consensus that insists on the imperative of economic development and contests the perceived unfairness of the developed countries' positions on global climate negotiations.

Indian Climate Policy: Choices and Challenges illustrates the complex constraints on Indian policymakers and provides material for more fruitful, better-informed discussions in Washington, Delhi, and all points between.

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India looms increasingly large in global climate policy. In 1990, when negotiations on the United Nations Framework Convention on Climate Change (UNFCCC) began, India produced 0.6 billion metric tons (0.6 Gt) of carbon dioxide, less than the Ukraine and about the same as the UK, a country one fifteenth India's size. Today, as the international community wrestles to reach agreement on global greenhouse strategies to succeed the expiring Kyoto Protocol, India's emissions have more than doubled to 1.3 Gt CO_2. India now ranks as the world's third largest consumer of primary energy supplies and its fourth largest carbon emitter. By the same token, the size of the Indian economy

has nearly tripled over the same period, with GDP soaring from US$ 1.1 trillion in 1990 to US$ 3.1 trillion in 2008 (2008 US$ using Purchasing Power Parity). On a PPP basis, India's vertiginous ascent has made it the planet's fourth biggest economy, behind the US, China, and Japan. Such growth rates have established India as a crucial environmental and economic power in the global arena. According to the latest projections by the International Energy Agency (IEA), by 2030 Indian GDP will more than quadruple to US$ 12.5 trillion, vaulting the country past Japan among the world's preeminent economies. So too, however, the IEA reference scenario foresees India's annual CO_2 emissions surging to 3.4 Gt, overtaking Russia to claim third place among the world's predominant emitters.[1]

Yet despite India's prodigious expansion in recent years, it remains very much a developing country. In 2005, more than 41 percent of the Indian population, some 450 million people, survived on less than US$ 1.25 a day, the World Bank's international poverty line benchmark. More than four in five Indians in rural areas and nearly half of city dwellers lacked improved sanitation services. And Indians consumed just 91 kilowatt hours (kwh) of electric power per head for domestic use, compared to the 3,000 kwh used by their industrialized Asian neighbors and 2,162 kwh in Japan. Meanwhile, 44 percent of the population still had no access to electricity at all.[2] India's emissions profile ultimately reflects this economic reality. With 17 percent of the world's inhabitants, India emits only 4.5 percent of the world's carbon. In 2006 the average Indian produced 1.13 metric tons of CO_2, the lowest of all the G20 economies, including fellow developing nations Brazil, China, Mexico, and South Africa. Indeed, Indian per capita emissions amounted to just 26 percent of the world average and 6 percent of the 19 metric tons of CO_2 generated by the average American every year.[3]

Economic development and poverty alleviation thus constitute primordial policy preoccupations for Indian policymakers. By some estimates, India will need to maintain economic growth rates of 8 percent to 10 percent in order to eradicate poverty and attain its human development goals. To realize sustained 8 percent annual growth, India would in turn need to expand its primary energy supply three to fourfold and boost electricity supply by some five to seven times current levels by 2031, according to studies by The Energy and Resources Institute

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[1] International Energy Agency. *CO_2 Emissions from Fuel Combustion: 2008 Edition* (Paris: OECD/IEA, 2008); International Energy Agency. *How the Energy Sector Can Deliver on a Climate Agreement in Copenhagen: Special Early Excerpt from the World Energy Outlook 2009 for the Bangkok UNFCCC Meeting* (Paris: OECD/IEA, 2009).
[2] United Nations Economic and Social Survey for Asia and the Pacific. *Economic and Social Survey of Asia and the Pacific 2009* (New York: UN, 2009), pp. 188, 190, 191; Prime Minister's Council on Climate Change. *National Action Plan on Climate Change* (New Delhi: Government of India, 2008), p.13.
[3] IEA, 2008, op. cit.

(TERI) in New Delhi.[4] Meeting these mounting energy demands will necessarily drive India's carbon emissions for the coming two decades. Nevertheless, India's overall climate footprint will not so soon surpass that of other major emitters. India's economy currently generates no more carbon per unit of output than do those of Japan or the European Union, and notably less than the US and China. Where India emits 0.34 kilograms of CO_2 per dollar of GDP (US$ 2000 at PPP), Japan emits 0.34 kg, the EU 0.33 kg, the US 0.51 kg, and China 0.65 kg.[5] Even in absolute terms, the IEA's reference scenario projects Indian emissions in 2030 will stand at 3.4 Gt CO_2, below those foreseen for the European Union, at 3.5 Gt, and those of the United States, at 5.5 Gt CO_2. Moreover, the same analyses calculate that all of India's CO_2 emissions up to 2030 will still constitute only 4 percent of historic world carbon production, far short of the EU and the US, which will by then have supplied 18 percent and 23 percent respectively of the cumulative global total.[6]

While India now numbers among the top sources of growing global greenhouse emissions, it also figures among those nations most vulnerable to the effects of climate change. According to the Intergovernmental Panel on Climate Change (IPCC), India has already witnessed warming of 0.68^{o}C during the 20th century. Hot days and multiple-day heat waves have become increasingly frequent over the past 100 years and deaths due to heat stress have risen. At the same time, the northwestern regions now experience an increasing number of extreme summer monsoon rains, while seasonal rainfall has been decreasing in the east. So too, the damages caused by intense cyclones have jumped substantially.[7]

With the latest evaluations in its Fourth Assessment Report, the IPCC suggests that India can expect these trends, or worse, to continue into the future. IPCC model scenarios project average temperatures will climb 1.56 to 5.44^{o}C (2.8 to 9.8^{o} Fahrenheit) in South Asia by 2099. Dry season rainfall will drop by 6 percent to 16 percent, while wet season rains will increase by 10 percent to 31 percent. Such shifts in temperature and precipitation patterns could carry major repercussions for India's freshwater resources and food production. Warming surface temperatures in the region appear to be contributing to melting the snow and ice pack in the Himalayas, where alpine glaciers are already receding more rapidly than anywhere in the world. The Himalayan glaciers, often called Asia's

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[4] The Energy and Resources Institute. *Mitigation Options for India: The Role of the International Community* (New Delhi: TERI, 2008).
[5] IEA, 2008, op. cit.
[6] IEA, 2009, op. cit.
[7] Cruz, Rex Victor et al. "Asia," in *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry et al. eds. (Cambridge: Cambridge University Press, 2007).

"water tower," nourish many of the continent's great rivers, including the Indus, Ganges, and Brahmaputra. Their retreat and disappearance would threaten the water supplies on which hundreds of millions of people in India and neighboring nations depend. All told, IPCC analyses judge India could suffer from outright water stress – annual availability of less than 1,000 cubic meters per capita – by 2025, and gross water availability could fall as much as 37 percent by mid-century. In addition to the implications for drinking water and sanitation, multiple studies reviewed by the IPCC suggest water scarcity and heat stress could considerably diminish crop yields in the region. Temperature increases of as little as 0.5 to 1.5°C might trim yield potentials for Indian wheat and maize by 2 to 5 percent. For greater warming, above 2.5°C, the consequent losses in non-irrigated wheat and rice yields in South Asia could cut net farm-level revenues by 9 to 25 percent. Even under the most conservative climate change scenarios, net cereal production for South Asian countries is expected to tumble by at least 4 to 10 percent.

Where some parts of India will face shrinking water supplies, others will face rising seas. Average global sea levels are projected to rise at a rate of 2 to 3mm per year over the coming 100 years. Low end scenarios estimate sea levels in Asia will be, at a minimum, 40 cm higher by the end of the 21st Century. The IPCC calculates that this would expose from 13 million to 94 million more people to flooding, with about 60 percent of this total in South Asia. In India, sea level rise of 100 cm would inundate 5,763 km^3 of the country's landmass.[8] (More recent analyses have found that measured sea level rise has been accelerating and that global sea levels are likely to rise markedly more than previously projected, perhaps by as much as 0.8 to 2 meters by 2100.)[9] Because of their high population density, susceptibility to coastal flooding and saltwater intrusion from sea level rise, and exposure to storm surges, the IPCC has specifically designated several of India's low-lying coastal river deltas – the Ganges (shared with Bangladesh), the Godavari, the Krishna, and the Mahanadi – as particular "hotspots" of climate change vulnerability.[10]

Indian policymakers well recognize the twin challenges of sustaining the economic development that has helped pull millions out of poverty while countering the climate impacts that could threaten the livelihoods and welfare of millions as well. India's National Action Plan on Climate Change released in

[8] Cruz et al., op. cit.
[9] McMullen, Catherine P. and Jason Jabbour eds. *Climate Change Science Compendium 2009* (New York: UNEP, 2009), pp.27-28.
[10] Robert J. Nicholls et al. "Coastal Systems and Low-lying Areas," in *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry et al. eds. (Cambridge: Cambridge University Press, 2007), p.327.

June 2008 explicitly declares that "[i]t is imperative to identify measures that promote our development objectives, while also yielding co-benefits for addressing climate change effects."[11] The Indian public recognizes the challenges too. Recent polling reveals that more than 80 percent of Indians regard climate change as posing a serious threat to themselves and their families and that more than 40 percent in fact wish to see their government make climate change an even higher priority than it does.

They are not alone in their sentiments. The same polls show that large majorities in nearly all of the G20 countries also deem climate change a serious risk, including 94 percent of Brazilians, 75 percent of Japanese, and 64 percent of Americans. So too, most publics in the major economies would like their governments to make combating climate change more of a priority, with three quarters of British and French citizens, two thirds of Chinese respondents, and more than half of Americans polled holding this opinion. With key international negotiations set to begin in Copenhagen in December 2009, policymakers from each of these nations will have the opportunity to answer their publics and make meeting the collective climate challenge an effective common priority of all nations.[12]

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This book represents a collective effort that would not have come to fruition without the tireless efforts of many individuals behind the scenes. Corey Sobel, Research Associate at the Stimson Center's *Regional Voices: Transnational Challenges* program, furnished extensive research and editorial contributions. Alison Yost and Shawn Woodley provided production design and shepherded the volume through the publication process. And the invaluable Nicole Zdrojewski, who manages all of the program's operations, ensured that everything ran smoothly. I am indebted to them all.

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[11] Prime Minister's Council on Climate Change, op. cit., p.13.
[12] Ray, Julie. "In Major Economies, Many See Threat from Climate Change," Gallup Poll, 8 July 2009, at http://www.gallup.com/poll/121526/major-economies-threat-climate-change.aspx; WorldPublicOpinion.Org. "World Public Opinion Assessing Governments on Climate Change," 29 July 2009 at www.worldpublicopinion.org.

CLIMATE CHANGE AND INDIA'S ENERGY POLICY:
CHALLENGES AND CHOICES

Ligia Noronha

India's energy policy faces enormous challenges ahead: challenges linked to addressing its energy poverty, managing India's high energy import dependence, and finding ways to address the electricity gap. Its ability to move to a more energy-secure future will depend very much not only on the sort of polices it adopts, but – especially in the context of energy – on what a "partially globalized world," a "world of thick networks of interdependence in which boundaries and states matter a great deal" makes possible or constrains.[1] This world is characterized by an intense competition for resources, increased resource nationalism, a period of high and volatile oil prices, and an increased link between energy security and climate change issues.

India's energy is insufficient to meet its needs. Some 600 million Indians lack electricity and 700 million depend on traditional fuels. Per capita consumption of 650 units of electricity per annum is well below the global average.[2] The country imports 70 percent of its oil, 11 percent of its coal, and 17 percent of its natural gas.[3] Its total installed electrical generating capacity is less that 150 gigawatts (GW), leading to estimated shortages of nearly 10 percent in energy terms and almost 17 percent in peak demand.[4] Energy requirements to meet India's development goals, according to the Integrated Energy Policy (IEP) formulated by the government's Planning Commission, would require India to go from 327 million tons of oil equivalent (mtoe) in 2003-2004 to as high as 1858 mtoe in 2031.[5] India's fossil fuel "path dependence," coupled with a low domestic resource base for oil and now increasingly the evidence of a smaller resource base than projected for coal, results in very high imported fossil fuel dependence. The IEP projects that India's import dependency will rise from about 30 percent in 2003-2004 to 59 percent of commercial energy consumption

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[1] Keohane, Robert O. *Power and Governance in a Partially Globalized World*. (London and New York: Routledge, 2002, p 16).
[2] Sethi, Surya. "India's Energy Challenges and Choices," in *India's Energy Security*, Ligia Noronha and Anant Sudarshan, eds. (London: Routledge, 2009, p.19).
[3] Planning Commission. *Integrated Energy Policy: Report of the Expert Committee* (New Delhi: Government of India, August 2006) at http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf.
[4] India has an installed generating capacity of less than 150 GW (Source: Ministry of Power, GOI and IEP, 2006).
[5] According to the *Integrated Energy Policy*, India needs to sustain an 8 percent to 10 percent economic growth rate, over the next 25 years, if it is to eradicate poverty and meet its human development goals (p. xiii).

in 2031-2032 (assuming an 8 percent growth rate during this period.) India's share of global supply of fossil fuels is projected to be between 3.7 and 10.9 percent by 2031-2032 in a range of scenarios. Thus, the concern is that India needs to increase its share of fossil fuels in a global market that is constrained by supplies and a global market in which other country demands are also rising.[6] Potential irregularities of supply and affordability become key energy security concerns.

To add to these import dependence concerns, the emerging carbon constraint poses a key challenge to India's ability to maneuver on the energy front, especially since India still needs to depend heavily on fossil fuels (especially coal) during the next 20 years. Ever since the rapid economic rise of China in the 1990s – and more latterly the growth of India – the center of the climate debate has shifted away from deciding how to address climate change based on a "common but differentiated responsibility" that took account of the historic responsibility of the developed world. The debate now focuses on the historic *and* future responsibilities of major carbon emitters, including large emerging nations such as India and China. No climate agreement is possible or sensible, the argument goes, unless these countries – which will use coal-based systems to develop – are treated as serious negotiating partners. So an extraordinary amount of pressure is being mounted on India and China to curb future emissions by accepting targets[7]: "[I]f not in a direct manner then indirectly through the guise of sectoral targets, efficiency or intensity norms or standards and norms for equipment."[8]

However, since there would be no future responsibility if there were no historic responsibility, the latter issue needs to be addressed first and explicitly before commitments and targets are sought from future large emitters. Taking strong action to address historic responsibility is key to such a "fairness argument"—the current OECD country reasoning for future emissions regulations ignores (i) Access to the ecological (carbon) space that the developed world has had to grow; (ii) The role that this free appropriation of ecological space has played in the generation of its own surplus wealth and human development; (iii) Large energy inequities in the world and the crucial role of energy in human development.[9] Nitin Desai, a Member of the Prime Minister's Council on

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[6] Sethi, *op cit*., p 22.

[7] The visit of Secretary of State Clinton to India in July 2009, the Waxman-Markey Bill approved by the House of Representatives on 26 June 2009, and comments by various heads of state are examples of this pressure.

[8] Ghosh, Prodipto. "Climate Change—India's Approach". Presentation given at The Energy and Resources Institute on 18 May 2009.

[9] This passage is taken from Noronha, Ligia. "India's Search for Energy Security," Michael Hintze Lecture on International Security, University of Sydney, 27 May 2009.

Climate Change, India, put it well: "[T]here is a need for a culture of responsibility and a culture of fairness ... between early and late users of the commons."[10]

But does even a Business-as-Usual (BAU) energy scenario in India imply a high growth in carbon emissions in 20 years? On 2 September 2009, the Government of India released the results of five model studies on India's greenhouse gas (GHG) emissions from 2010 to 2030.[11] The projections of carbon emissions to 2030 in a BAU scenario range from 2.77 tons per capita CO_2 in a study by the National Council on Applied Economic Research (NCAER) using CGE modeling, to 5.0 tons per capita CO_2 by The Energy and Resources Institute (TERI) using the MARKAL model.[12] These studies assume no GHG mitigation policy in India by 2031. The BAU scenario suggests that India's per capita emissions in that year (except in the TERI 2008 study) will stay below the global average of 4.22 tons per capita in 2005.[13] Each of the studies projects a continuous decline in energy intensity and thus CO_2 intensities of the economy until 2030 in a BAU case (as a result of factor productivity improvements and autonomous energy efficiency improvements.)

Given the scale of India's future emissions relative to global trends, its transition to a less fossil fuel-intensive energy path is not expected to make much difference to the trajectory of climate change. Despite this, such a transition will have important implications for its energy security imperative and hence *must* occur. India's oil dependence carries with it an economic risk linked to oil price volatility and the economic costs of a major disruption in global oil supplies, as well as the geopolitical risks associated with factors beyond its control stemming from a high dependence on a few southwest Asian countries and Nigeria. The coal situation is better than that of oil, as of now, but there are already voices emerging in some developed coal-rich countries suggesting that coal exports should be reduced and even terminated as part of climate responses.[14]

Thus, the energy security concerns of India require that it reduce the use of fossil fuels either through improved efficiency measures or through substitution into

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[10] 2008 Shangrila Dialogue quoted in "The Sixth IISS Global Strategic Review," 12–14 September 2008, Geneva, *IISS News*, September 2008, p 4.

[11] Climate Modeling Forum, *India's GHG Emission Profile: Results of Five Climate Modelling Studies* (New Delhi: Ministry of Environment and Forests, Government of India, September 2009), at http://moef.nic.in/downloads/home/GHG-report.pdf.

[12] "Mitigation Options for India: The Role of the International community," TERI Background Paper for COP 14 at Poznan, at http://www.teriin.org/events/docs/Cop14/mitigation.pdf.

[13] It is 5 tons per capita in the TERI study.

[14] Pearse, Guy. "Quarry Vision: Coal, Climate Change and The End of The Resources Boom", *Quarterly Essay*, Issue 33, 2009.

non-fossil fuels. The electricity sector seems best situated to make the transition into the renewable energy technologies of solar, wind, biomass, and nuclear, given that around 80 percent of its capacity needs will materialize between 2009 and 2031-2032, and 60 percent between 2017-2018 and 2031-2032. The TERI study estimates that a BAU pathway for India implies a cumulative investment of US$ 1.4 trillion in power generation technologies from 2001-2002 to 2036-2037. However, investment requirements are expected to increase by four to seven times if a low carbon pathway is adopted.[15]

The pressure on India for action on future emissions is hardening postures and is, in fact, beginning to become counterproductive. Indian negotiators rightly perceive that the current developments constitute the pursuit by the developed world of strategic agendas through the environmental route. This perception holds that India and China, unconstrained by carbon emission targets, will be able to produce goods more cheaply than those of the OECD countries that have to incur costs to reduce embodied carbon in order to meet their carbon reduction targets. Emerging legislation in the US that seeks to target exports of countries that do not accept emission commitments adds weight to this view. For an emerging economy to accept legally-binding carbon targets at this stage would impose heavy costs on that economy. It would reduce the time it needs to make the energy transitions to a less fossil fuel-dependent path at a pace and cost that it can afford. This is a fact, given the urgency and the magnitude of an emerging economy's energy demands, the initial conditions of poverty, and the overall social and economic context in which production takes place. Public opinion in India, although still emerging, is also beginning to perceive this new pressure as linked to developed country concerns surrounding the competitiveness of emerging nations. But there is also a view that Indian policymakers should use the concern with climate change as an opportunity to leapfrog into a greener energy future.

Many of the measures to address energy security concerns also address carbon concerns—they reduce the carbon intensity of the energy sector. Solar-based power technologies have practically no form of emissions and would also lead to energy security by cutting back on coal and oil requirements to meet final demand. Moreover, solar – like other renewable energy technologies (RETs) – can be used effectively in decentralized systems, thereby reducing the need for the infrastructure investments of extending the grid out to them, reducing transmission losses, and increasing energy availability to the currently underserved. It is in recognition of these dual benefits that the National Action

[15] TERI, 2008, op. cit., pp.15-17, p.22.

Plan on Climate Change has placed a strong emphasis on RETs and energy efficiency measures and why other planning and financial arms of the government are preparing to scale these up in its federating States. India needs to publicize ongoing and planned domestic actions more, but it also needs to ensure these actions are implemented.

Climate and energy security concerns create challenges for India's energy policy, but they also provide enormous opportunities to move its publics to cleaner energy trajectories and technologies in the long run. But, as has been argued elsewhere, India needs time and support to make the energy transition and active citizens who push for this change domestically. Many are pressuring India into accepting legally-binding international carbon commitments either because it is believed necessary to achieve the desired outcome or, more cynically, in order to incentivize those that are more responsible and reluctant to deliver on their international obligations on carbon emission reduction targets. This is no way to produce just outcomes.

INDIAN INDUSTRY AND CLIMATE CHANGE:
PERCEPTIONS, POLICIES, AND POSSIBILITIES

Chandra Bhushan

BEWILDERED, CONFUSED, UNSURE, OPPORTUNISTIC, OPTIMISTIC

This is the spectrum of terms – wide as it is – that can best describe or define the response of Indian industry to climate change. There is neither one uniform perception about climate change in Indian industry, nor one position. There is one common policy, however, that all sectors of industry are currently adhering to: that of "wait and watch." Indian industrialists also are a bit wary of the possibility of linking global trade with climate change. The proposed carbon tax on imports under the American Clean Energy and Security Act of 2009, for example, has received much criticism from them. Essentially, Indian industry is waiting for the outcome of the 15th Conference of Parties at Copenhagen to plan its future course of action.

The industrial sector in India is large and diverse, encompassing some 150,000 manufacturing firms that employ more than 9 million people.[1] Only one third of these firms are in the corporate sector; the remaining two thirds fall into varying categories including individual proprietorship, partnership, family-owned, and cooperative society. Therefore, the views of the Indian corporate sector – those most featured in the press – on climate change are not fully representative of Indian industry.

When US Secretary of State Hillary Clinton met top Indian business leaders in Mumbai in July 2009, she heard the views of the corporate sector. Hence, the feedback she received came only from a third of Indian industry. When she said that she had found a positive response from Indian businesses on climate change, she was essentially referring to a segment of the country's industry that is now globalized and sees some opportunity in climate change (especially with respect to technology transfer and emission trading.) She didn't get to hear the opinions of the crucial small- and medium-scale sectors—crucial because these sectors dominate in terms of sheer numbers, are Indian industry's biggest employers, and, most significantly, need the most assistance in technology and finance to reduce energy consumption and greenhouse gas (GHG) emissions. This sector is currently unsure about the impact that climate change will have on its future

[1] Government of India. *Annual Survey of Industries 2005-06*. Ministry of Statistics and Programme Implementation at http://mospi.nic.in/mospi_asi.htm.

survival. Will these firms be closed in the name of reducing emissions or will they be assisted in emitting less? Their uncertainty has led them to look at climate change with deep suspicion. One thing is clear, however: they have huge local political clout and their voices will count in whatever strategy the Government of India adopts on climate change.

All told, the consumption of industrial products in India is still very low. Annual per capita cement consumption, for instance, is about 130 kg, compared to the global average of 355 kg per year. The country's per capita paper consumption is a mere 7.2 kg, compared to 300 kg in North America. India uses only one fifth the global average per capita consumption of steel, while its per capita electricity consumption of about 650 kilowatt hours (kwh) is one twentieth of that of the US. Therefore, Indian industry will continue to grow to meet the basic needs of the large majority and the rising aspirations of the middle and upper classes. Consequently, energy consumption and GHG emissions from Indian industry are bound to increase. What remains in the realm of conjecture is the rate of this growth or the moment when emissions from Indian industry will peak. Defining Business-As-Usual (BAU) emissions trajectories for a developing country like India is, thus, neither realistic nor feasible.

ENERGY EFFICIENCY IN INDIAN INDUSTRY

Contrary to popular perceptions, the energy efficiency of Indian industry compares quite favorably with that of the developed world. In some sectors, like cement and petrochemicals, it is even better than the OECD average. An unreliable electricity supply and the high cost of energy have ensured that Indian companies invest a lot of effort in reducing energy consumption to remain competitive. In terms of purchasing power parity (PPP), power tariffs in India for industry and commerce are among the highest in the world. For instance, compared to the electricity price of US$ 0.064/kwh for industries in the US in 2007, Indian industries paid US$ 0.08–0.1/kwh.[2] In addition, India is still in the process of building its industrial infrastructure and has access to energy-efficient technologies that are being adopted to reduce the energy bill. The cement sector provides a good example of this.

The Indian cement industry is a child of the post-economic liberalization era—the period beginning in 1991 when the Indian economy was liberalized and opened to foreign competition. Energy is the biggest cost in cement

[2] US Energy Information Administration. Electricity Prices for Industry 2007, at http://www.eia.doe.gov/emeu/international/elecprii.html.

manufacturing and cement companies in India have installed state-of-the-art energy-efficient technologies to curtail their energy bills. Today, specific thermal energy consumption in India's cement industry is 3.3–4.0 gigajoules (GJ) per ton of clinker (cementitious material made from limestone which is ground with additives to make cement) compared to 5.0–5.5 GJ/ton of clinker in the US. Specific power consumption in the Indian cement industry is about 100 kwh/ton of cement, compared to 140 kwh/ton of cement in the US. And CO_2 emissions per ton of cement in India are 750 kg, compared to 850 kg in the US.[3]

The fact of the matter is that India's energy intensity peaked in 1985 at 0.30 kg of oil equivalent (kgoe) per dollar of GDP (on a PPP basis at year 2000 US$ value) at a much lower per capita GDP than the developed world's and has fallen since then to about half its peak value. India now consumes 0.16 kgoe per dollar of GDP (in 2000 US$ PPP), which is lower than the 0.23 kgoe of China, 0.22 kgoe of the US, and the world average of 0.21 kgoe. India's energy intensity is even marginally lower than that of Germany and the OECD average.[4] However, there is still a large potential to reduce energy intensity further, especially in small- and medium-scale industries and in sectors like pulp and paper, iron and steel, engineering, etc. Regulatory instruments combined with low-carbon technology diffusion, capacity building, and financial incentives will be the key to reducing energy intensity and GHG emissions.

The decision taken by the Government of India in August 2009 to set mandatory energy efficiency standards under the National Action Plan for Climate Change in nine major energy consuming sectors (eight industrial sectors and the railways) and allowing these sectors to trade domestically in energy-saving certificates is a good starting point. However, this alone will not be sufficient, considering the scale of emissions reductions required globally to meet the target of holding warming to 2^{o}C above pre-industrial levels.[5]

OPPORTUNITIES FOR INDIAN INDUSTRY

Indian industries have grabbed the opportunity provided by the Clean Development Mechanism (CDM) with both hands. About one fifth of all

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[3] Bhushan, Chandra, and Monali Zeya Hazra. *Concrete Facts: The Life Cycle of the Indian Cement Industry* (New Delhi: Centre for Science and Environment, 2005).

[4] Shahi, R.V. "India's Strategy Toward Energy Development and Energy Security," paper presented by the Secretary to the Government of India, Ministry of Power, at the International Energy Association meeting, 12 December 2006, Sydney, Australia.

[5] As agreed at the 2009 L'Aquila Summit by the Major Economies countries, including India. See: "Declaration of the Leaders of the Major Economies Forum on Energy and Climate," 9 July 2009, at http://www.g8italia2009.it/static/G8_Allegato/MEF_Declarationl.pdf.

Certified Emissions Reductions issued so far have been from India. According to official estimates, CDM will help India offset about 10 percent of its total emissions per year by 2012.[6] However, CDM has provided incentives for only the "low-hanging fruits" in energy efficiency, industrial processes, and renewable energy. For the transformational innovations necessary to leapfrog current technologies, resource flows from CDM in its present form will be neither reliable nor adequate. A combination of emission trading schemes (with a high floor price for transformational technologies) and fund-based mechanisms (to support incremental costs of clean technology) will be required to incentivize mitigation actions at the scale needed to prevent dangerous climate change.

Technology development, deployment, and diffusion for existing and near-market low-carbon technologies are critical for reducing GHG emissions from Indian industry. For this, intellectual property rights (IPR) issues need to be handled constructively—the goal should be to make technology accessible to developing countries like India as quickly as possible and at a reasonable cost. Incentives for innovation should not be compromised, but nor should IPR become an obstacle to solving the climate crisis. Constructive approaches like segmented/parallel markets (IPR protection is enforced in some markets and overridden in others), public sector purchasing of IPRs, and advanced purchase commitments (similar to those of the Global Fund to Fight AIDS, Tuberculosis and Malaria) are some of the modalities through which technology can be quickly diffused without compromising innovation. These flexibilities exist in the World Trade Organization's agreement on Trade Related Aspects of Intellectual Property Rights and current national laws are being used to supply cheap drugs to the developing countries.

It is clear that India has major opportunities to reduce its emissions. According to a recent study done by McKinsey & Company on opportunities and costs of GHG abatement in India, there is an opportunity to reduce emissions from industry by about 680 million tons of carbon dioxide equivalent (CO2e) per year by 2030. Current GHG emissions from industry – including electricity – are estimated to be about 750 million tons CO2e. But most of these opportunities are expensive. India will need incremental capital of US$ 900 billion to US$ 1.1 trillion between 2010 and 2030 to reduce its emissions by 30 to 50 percent by 2030 from the BAU trajectory.[7]

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[6] Climate Modelling Forum. *India's GHG Emissions Profile: Results of Five Climate Modelling Studies* (New Delhi: Ministry of Environment and Forests, Government of India, September 2009).

[7] McKinsey & Company. *Environmental and Energy Sustainability: An Approach for India* (Mumbai: McKinsey & Company, 2009).

The question is how to find this money. Countries like India provide the world with an opportunity to "avoid" additional emissions. It is, therefore, in the interest of the world (the rich world, that is) to provide resources so that India doesn't first pollute, and then clean up—or first be inefficient, and then save energy.

CLIMATE CHANGE THREATS TO INDIA'S WATER RESOURCES AND EMERGING POLICY RESPONSES

Chandan Mahanta

India's climate change policy is in an emergent stage. Under the global climate regime, India figures as a Non-Annex I nation and thus is not bound by quantitative emissions reduction targets. Even so, India acknowledges its substantial role in addressing the threats arising from climate change. "There should be no doubt in anybody's mind," the prime minister recently stated, "that we fully recognise not just how important this issue is to India but also our obligation to address it."[1] Through its National Action Plan for Climate Change (NAPCC) and by funding adaptation efforts, the Indian government has undertaken significant policy steps.[2] Establishing National Missions in eight different areas, the NAPCC calls for boosting solar power production, reforestation of two thirds of the country, financial incentives for energy efficiency, research on glacial melt, and development of sustainable agriculture, among other measures. Yet it has also been criticized for not establishing hard targets, particularly in the crucial area of water management.

Until now, India has addressed climate change predominantly in the energy sector—the water resource sector has not received the priority attention that it merits. There is a growing shortfall of water in the Indian Subcontinent and future threats imperil water supplies and ecosystems throughout the entire region. Indeed, the World Bank has warned that India is on the brink of severe water crises with most of its states living under the stress of water scarcity.[3] The National Water Mission component of the NAPCC proposes enacting a new national water policy to combat, mitigate, and adapt to water scarcity scenarios that may arise out of climate change. If climate change uncertainties are to be integrated into water management planning, there is an urgent need to augment water storage capacity, consider reducing subsidies that encourage overconsumption, and practice more judicious use of ground and surface water. For India to sustain an 8 percent annual economic growth rate, efficient water management is mandatory.

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[1] Manoj, C.G. "Climate Change: PM Asks States to Ready Their Action Plans," *Indian Express*, 19 August 2009 at http://www.indianexpress.com/news/Climate-change--PM-asks-states-to-ready-their-action-plans/503761.

[2] Prime Minister's Council on Climate Change. *National Action Plan on Climate Change* (New Delhi: Government of India, 2008).

[3] Briscoe, John. *India's Water Economy: Bracing for a Turbulent Future*, Report No. 34750- IN (Washington, DC: World Bank, 2005).

THE POLICY PICTURE

Water demand for agricultural, household, recreational, industrial, and environmental use is rapidly increasing: India's population is predicted to reach 1.4 billion in another 15 years with an annual growth rate of 1.3 percent. Additionally, there is unprecedented urbanization in India which is itself greatly energy and water intensive. To feed this burgeoning population, India must envisage increasing its food production from about 208 million tons in the period 1999-2000 to around 350 million tons by 2050. Agricultural demand for irrigation is already the single largest draw on India's water, yet estimates by the Ministry of Water Resources indicate that by the year 2050 irrigation needs will rise by 56 percent. At the same time, India's drinking water demand will double and India will also have to increase water supplies to industries fivefold and supply 16 times more water for energy.[4]

While demand for water is expected to increase, supplies may be falling. Per capita surface water availability has already slumped from 2,309 m^3 in 1991 to 1,902 m^3 in 2001 and is projected to fall to 1,401 m^3 in 2025 and 1,191 m^3 by 2050.[5] There are disturbing signs of decrease in discharge of some rivers, especially pronounced in the dry season months (when flow falls to only 10-15 percent of the net annual discharge.) Recent analyses using the terrestrial water storage-change observations from the NASA Gravity Recovery and Climate Experiment satellites have reported that groundwater is being dramatically depleted in the Indian states of Rajasthan, Punjab, and Haryana (including Delhi), with 109 km^3 of groundwater being lost during the 2002 to 2008 study period. The dropping water levels in these regions is largely attributed to unsustainable consumption of groundwater for irrigation and other uses along with increased run-off and/or evapotranspiration, which climate change may further exacerbate.[6] An increase in the irrigation area – based on the expectation that the present water availability will continue in the future – risks worsening water scarcity. Clearly, any climate-induced alteration to the hydrological cycle would have a direct impact on the economy of a country in which more than half the population makes its living from agriculture. With such stakes, the need for a sustainable water resource policy is urgently felt.

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[4] *Asian Development Bank. Water Resources Development in India: Critical Issues and Strategic Options* (Manila: ADB, n.d.) at http://www.adb.org/Documents/Assessments/Water/IND/Water-Assessment.pdf.

[5] Sharma, D. and A. Bharat. "Conceptualizing Risk Assessment Framework for Impacts of Climate Change on Water Resources" C*urrent Science*, Vol. 96 (1044-1052) 2009.

[6] Rodell, M., I. Velicogna and J.S. Famiglietti. "Satellite Based Estimates of Groundwater Depletion in India," *Nature*, Vol.460 (999-1002) 2009.

India's NAPCC, released in June 2008, outlines the country's existing and future policies to address global warming issues. To counter the projected water scarcity due to the changing climate scenario, the NAPCC's National Water Mission sets a goal of a 20 percent improvement in water use efficiency through pricing and other measures. Other goals include: (i) Establishing a comprehensive water database in the public domain and also a reliable assessment of the impact of climate change on water resources; (ii) Promoting citizen and State action for water conservation, augmentation, and preservation; (iii) Focusing more attention on over-exploited areas; and (iv) Promoting basin-level integrated water resources management (IWRM). The Mission aims to ensure the equitable distribution of water and to minimize growing water needs, making use of such techniques as waste water recycling, low temperature desalination technologies for coastal areas, and rainwater harvesting, coupled with equitable and efficient management structures.

Yet it remains to be seen how India's NAPCC will be carried out. Critics of the plan argue that while it could have been development- and environment-friendly, it has proven to be otherwise. While the water mission has yet to take off, certain projects under the Clean Development Mechanism (CDM) of the NAPCC, for instance, are blamed for failing to minimize their social or environmental footprints and for not taking into account the disadvantaged and local communities in the project planning and decision-making process. Bottom-up participatory approaches, cost effectiveness, and environmentally sustainable projects need to be the focus of any effective plan of action.

Judging from past experiences, however, many observers suspect that it will not be easy to follow through on the NAPCC in letter and spirit. Take for example the highly vulnerable Brahmaputra Basin in the Eastern Himalayas. Average per capita income is 30 percent below the national average. Here, all water-related sectors reflect the federal government's monopoly on decision-making, complex and ineffective institutional arrangements, an incomplete and often inaccessible water resource knowledge base, and cynicism by local stakeholders based on past initiatives' failures to deliver—particularly the futile attempts involved with flood mitigation that has remained elusive over the decades. The latest instance of an apparent failure in policy initiative has been the move for the mega-hydropower development scheme in Northeast India (bordering China) that is intended to generate about 40,000 megawatts, without adequate consideration of the environmental and social impacts on local inhabitants. Such moves need to be changed if climate change impact is to be neutralized—regional government and local communities and stakeholders must be involved in future policymaking and implementation.

FUTURE POLICY IMPLICATIONS

The successful implementation of a national water policy responsive to the climate challenge will require both a dependable knowledge base and appropriate institutional support at the national, regional, and local levels. On the informational front, there is need to build up a reliable time-series database with trends for relevant hydrological variables. The application of predictive models can then help formulate estimates of the potential impacts of future changes in hydrological systems. Continuous monitoring of water variability in response to changing climatic conditions will also be necessary. Comprehensive, credible assessments of basin-scale potentials for climate change resilience of water resources through watershed development, groundwater recharge, water saving technologies, and high output/low input-based practices can be carried out. Simultaneously, relative water footprints, food footprints, and ecological footprints of different water options should also be integrated in water resource planning.

On the institutional side, setting up legal and organizational structures to ensure integrated water management for climate change, regulatory mechanisms to monitor water use efficiency, and bottom-up water resource governance is an urgent need. Enacting credible, legally enforceable, community-led regulation can ensure the sustainable management of both surface water and groundwater supplies through the sustenance of existing replenishment systems. Local institutional support can also foster community resilience to water stresses by securing access to diverse sources – e.g., ensuring that households possess their own rainwater tanks – and protecting existing water sources by low-cost technologies that minimize over-extraction of groundwater or surface water (respecting environmental flow requirements where applicable.) The emphasis should be on targeting climate and water policy action at appropriate scales through innovation and diversity, flexibility and accountability.[7]

CONCLUSION

The national water mission has to take off on a sound trajectory to ensure sustainable water security for all Indians. This may require hard political initiatives to pass on more decentralized decision-making capacities to local governments (which are often lacking at present.) In turn, the strength of local institutions – particularly those which operate and maintain water infrastructures – has to be enhanced with adequate resources. It is a paradox that India possesses an apparently vigorous planning mechanism with sufficient investment

[7] Sovacool, B.K. and M.A. Brown. "Scaling the Policy Response to Climate Change," *Policy and Society*, Vol.27, No.4 (2009).

and yet remains under-prepared vis-à-vis climate change impacts. The failing monsoon of 2009, followed by the unprecedented rains of early October in the southern states of India, has established once more that India must be ready to address such anomalies more frequently than ever. Obviously, physical resources without the required institutional arrangements and a holistic vision will remain inadequate to brace the country for the new challenge of climate change.

Key among the necessary policy changes are: (i) Regional and transboundary cooperation in water security—India must take the lead in consulting SAARC nations to foster information-sharing and joint management of transboundary water resources and perhaps shape a common stance on international climate change negotiations; (ii) Increased accountability by the different actors; and (iii) Decentralization of decision making.

It is vital that this process include mechanisms for equitably sharing both the risks and benefits to be derived from climate change adaptation projects and focus not only on broad-based, long-term development, but also on those corresponding activities that have immediate impacts on water security at the community level. It is essential to develop an analytical framework that can help identify and prioritize high-return water management project investments; to identify critical institutional reforms necessary for the more effective development and management of the country's water resources; and to create a platform for the interaction of the relevant stakeholders, ultimately leading to water sector reforms to blunt climate change risks. Institutions must be able to create and manage an environment of incentives and disincentives that encourage initiatives consistent with sound water policy objectives for the benefit of all stakeholders, including the most socially and environmentally vulnerable communities.

CLIMATE RISKS TO INDIAN NATIONAL SECURITY

Brahma Chellaney

India may be a great power-in-waiting, but it probably lives in the world's worst neighborhood. Whichever way India looks, it sees crisis across its frontiers. The tyranny of geography that India confronts is only getting worse, putting greater pressure on its security. To this picture must now be added the risks from climate change, which has been correctly identified as a threat multiplier. What all this underscores is the need for the Indian republic to evolve more dynamic and innovative approaches to diplomacy and national defense as well as to build greater state capacity in order to meet contingencies.

Climate change, unfortunately, has become a divisive issue internationally before a plan for a low-carbon future has evolved. At a time of greater international divisiveness on core challenges – from disarmament and terrorism to the energy crisis and the Doha Round of world trade talks – the world can ill afford political rancor over a climate crisis that threatens to exacerbate security challenges. While gaps in scientific knowledge make it easy to exaggerate or underestimate the likely impact of climate change, three broad strategic effects can be visualized in relation to India.

MULTIPLYING CLIMATE THREATS

1. *Climate change would intensify interstate and intrastate competition over natural resources, making resource conflicts more likely.*

A new Great Game over water could unfold, given China's control over the source of most of Asia's major rivers—the Plateau of Tibet. Accelerated melting of glaciers and mountain snows would affect river water flows, although higher average temperatures are likely to bring more rainfall in the tropics.

Intrastate water disputes already are endemic in Asia, with India being the most prominent case. But it is the potential for interstate water conflict in Asia that ought to be of greater concern because of the strategic ramifications.

Tibet's water-related status in the world indeed is unique. No other area in the world is a water repository of such size, serving as a lifeline for nearly half of the global population living in southern and southeastern Asia and China. Tibet's

vast glaciers, huge underground springs, and high altitude have endowed it with the world's greatest river systems. But China is now pursuing major inter-basin and inter-river water transfer projects on the Tibetan plateau which threaten to diminish international river flows into India and other co-riparian states. In fact, China has been damming most international rivers flowing out of Tibet (Tibet's fragile ecosystem is already threatened by global warming.)[1] The only rivers on which no hydro-engineering works have been undertaken so far are the Indus (whose basin falls mostly in India and Pakistan), and the Salween (which flows into Burma and Thailand.) Local authorities in China's Yunnan province, however, are considering damming the Salween in the quake-prone upstream region.

Before such hydro-engineering projects sow the seeds of water conflict, China ought to build institutionalized, cooperative river basin arrangements with downstream states. Against this background, it is hardly a surprise that water is becoming a key security issue in Sino-Indian relations and is a potential source of enduring discord. India has been pressing China for transparency, greater hydrological data-sharing, and a commitment not to redirect the natural flow of any river or diminish cross-border water flows. But even a joint expert-level mechanism – set up in 2007 merely for "interaction and cooperation" on hydrological data – has proven of little value. The most dangerous idea China is toying with is the northward rerouting of the Brahmaputra River, known as *Yarlung Tsangpo* to Tibetans.[2] Diversion of the Brahmaputra's water to the parched Yellow River is an idea that China does not discuss in public because the project implies environmental devastation of India's northeastern plains and eastern Bangladesh and would thus be akin to a declaration of water war against India and Bangladesh.

China and India already are water-stressed economies. The spread of irrigated farming and water-intensive industries – together with the demands of a rising middle class – have led to a severe struggle for more water. Indeed, both countries have entered an era of perennial water scarcity. Rapid economic growth could slow in the face of acute scarcity if the demand for water continues to grow at its current frantic pace. Such a development would transform China and India – both food-exporting countries – into major importers and would thus exacerbate the global food crisis.

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[1] Moore, Malcolm. "China Plans Dams Across Tibet," *Telegraph*, 14 October 2008, at http://www.telegraph.co.uk/news/worldnews/asia/tibet/3193790/China-plans-dams-across-Tibet.html.
[2] Ramachandran, Sudha. "India Quakes Over China's Water Plan," *Asia Times Online*, 9 December 2008, at http://www.atimes.com/atimes/China/JL09Ad01.html.

2. *Higher frequency of extreme weather events (such as hurricanes, flooding, and drought) and a rise in ocean levels are likely to spur greater interstate and intrastate migration – especially of the poor and the vulnerable – from the delta and coastal regions to the hinterlands.*

Such an influx of outsiders would socially swamp inland areas and upset existing fragile ethnic balances—provoking a backlash that strains internal and regional security. It should not be forgotten that many societies in the region are a potent mix of ethnicity, culture, and religion.

India, for example, could face a huge refugee influx from the world's seventh most populous country, Bangladesh. Having been born in blood in 1971, Bangladesh faces extinction from saltwater incursion, with the International Panel on Climate Change (IPCC) saying that country is set to lose 17 percent of its land and 30 percent of its food production by 2050. Bangladesh today faces a rising frequency of natural disasters. In addition to the millions of Bangladeshis that already have illegally settled in India, New Delhi would have to brace up for the potential arrival of tens of millions more people.

For India, the ethnic expansion of Bangladesh beyond its political borders not only sets up enduring trans-border links, but it also makes New Delhi's already-complex task of border management even more onerous. As brought out by Indian census figures, Indian districts bordering Bangladesh have become Bangladeshi-majority areas. It is perhaps the first time in modern history that a country has expanded its ethnic frontiers without expanding its political borders. "Climate refugees," however, would not all come from across India's borders. Within India itself, those driven out by floods, cyclones, and saltwater incursion would head for settlements on higher ground. In some cases, the effects of such refugee influxes would be to undermine social stability and internal cohesion locally.

3. *Human security will be the main casualty as climate change delivers a major blow to vulnerable economic sectors.*

Economic and social disparities – already wide in Indian society – would intensify. The fact that there is a Maoist insurgency in the poorest districts of India at a time when the country is booming economically is a testament to the costs of growing inequalities. That ragtag band of rebels wishes to supplant Indian parliamentary democracy with a proletariat dictatorship inspired by Mao Zedong's *Little Red Book.*

The specter of resource competition, large-scale movement of "climate refugees," social and political tensions, and a higher frequency and intensity of extreme weather events helps underscore the human-security costs. Climate variability will bring change to the social-economic-political environments on which the security of individuals and communities rest. Authorities – as well as communities – will be forced to innovate and manage under a climate change-driven paradigm. Building greater institutional and organizational capacity, early-warning systems, more efficient irrigation practices, and new farm varieties will all become necessary.

THE FRONTLINE OF CLIMATE CHANGE

Against this background, India is likely to find itself on the frontline of climate change. To deal with these national security implications, India needs to frame the concept of security more broadly and redefine its defense planning and preparedness. Unconventional challenges – from transnational terrorism to illegal refugee inflows – already have become significant in India's security calculus. India also needs to build greater state capacity – at federal, provincial, and local levels – to tackle various contingencies and adapt to a climate change-driven paradigm. Climate change holds the greatest risks for India in the agricultural sector—a sector that employs half of the Indian workforce and yet makes up just 18 percent of the GDP. The challenge of ensuring food security and social stability demands greater national investments in rural infrastructure and agriculture and also simultaneously requires finding a way to leapfrog to green technologies.

A lot can be done to combat climate change outside any regime. India's US$ 22 billion solar-energy program, US$ 2.5 billion forestation fund, and new national energy-efficiency mission are initiatives in the right direction.

Internationally, though, Indian diplomacy must ensure that the country is not saddled with unfair obligations that compound its challenges. Equity in burden-sharing has to be ensured. The challenge is to devise carbon standards that help protect the material and social benefits of economic growth in the developing world without damaging prosperity in the developed countries.

But just as the five original nuclear weapons states helped fashion the 1970 Nuclear Nonproliferation Treaty (NPT) to perpetuate their privileges, countries that became wealthy early wish to preserve their prerogatives in a climate change regime despite their legacy of environmental damage and continuing high carbon emissions. This has raised the danger of rich nations locking in their advantages

by revising the 1992 Rio bargain and re-jiggering the Kyoto Protocol obligations through a new regime. This could create another global divide between haves and have-nots—an NPT of climate change. An enduring international regime to combat global warming will have to be anchored in differential responsibility, a concept at the heart of the United Nations Framework Convention on Climate Change and the Kyoto Protocol (it is a concept also embedded in international law through several other agreements—from the Montreal Protocol on Substances that Deplete the Ozone Layer to the Treaty of Maastricht.) Climate change, it is evident, is not just a matter of science but also a matter of geopolitics.

INDIAN PUBLIC PERCEPTIONS OF THE INTERNATIONAL CLIMATE CHANGE NEGOTIATIONS

Prem Shankar Jha

As the Copenhagen climate change conference draws near, India has begun to be singled out by the international media as a "spoiler" in the battle to save the planet. This reputation stems from India's insistence that it will not accept ceilings on carbon emissions if this means sacrificing economic growth, and that the industrialised countries – which are mainly responsible for the dangerous concentration of greenhouse gases (GHGs) in the atmosphere – must accept responsibility for first stabilizing the atmosphere and then bringing GHG levels down.

The criticism of India reached a crescendo immediately after the G-8 summit at Aquila. In its July 11 issue, *The Economist* referred derisively to India's demand for "carbon space."[1] Less than a week later, *The New York Times* linked India's recalcitrance on global warming to its determination to misuse the Indo-US nuclear deal to make more nuclear weapons and missiles and also blamed India for single-handedly sabotaging the Doha round of trade negotiations.[2]

Indian policymakers and environmentalists resent these criticisms deeply. But what they find even more difficult to swallow is the way in which the OECD countries – having brought the world to where it is today – are now attempting to tailor the agenda to their own political compulsions and ideological preferences while paying lip service to the political and ideological necessities of developing countries. Indians feel both hurt and bitter that India is being made a target precisely because – being a functioning democracy – it feels both the compulsion and duty to articulate developing countries' point of view.

THE SOURCES OF INDIA'S RESENTMENT

To understand where India's resentment springs from it is necessary to draw a distinction between concern for global warming and concern for the environment. Over the last four decades, Indian environmentalists have chalked up a long list of successes in their battle to minimize the damage inflicted by

[1] "Wanted: Fresh Air," *The Economist*, 11 July 2009.
[2] A.R. Lakshmanan, Indira. "U.S. Needs to Play its Cards Right in India," *New York Times*, 14 July 2009.

economic development on the environment—ranging from halting deforestation to establishing more than 300 national parks. But the focus of environmentalists has remained national. The threat they have perceived is from the inexorable commercialisation and exploitation of nature. Environmentalists' awareness of the threat posed to all of humanity by the rising concentration of CO_2 and other greenhouse gases in the atmosphere was – and still is – limited.

The media itself is partly to blame. Five years ago, Al Gore's film "An Inconvenient Truth" received warm but transient attention in India—it provoked no analysis and triggered no warnings to the public. When Gore and the Intergovernmental Panel on Climate Change (IPCC) were awarded the Nobel Prize in 2007 and R.K.Pachauri went to Stockholm to receive the prize on the IPCC's behalf, the media nearly suffocated on an overdose of national pride and treated Pachauri's achievement simply as another feather in India's cap.

But the media is not wholly to blame, for by the time that the IPCC's 2007 Fourth Assessment Report was released, a large part of the Indian intelligentsia had become skeptical of the warnings emanating from the Western climate science community. The most important cause for such skepticism was that India's very first encounter with global warming policy had been a bruising one.
In March 1990, three months before the Rio conference on Environment and Development, the US-based World Resources Institute (WRI) published a study that held developing countries responsible for fully 47 percent of the rise in the concentration of GHGs in the atmosphere.[3] According to the report, while the developing countries did account for only a small fraction of the fossil fuels consumed by the human race, it contributed large amounts of GHGs through deforestation and the burning of biomass and also by way of methane emissions from its rice fields and from the digestive systems of cattle. Needless to say, the two main culprits were China and India.

Indian environmentalists were flabbergasted. But their surprise turned into anger when the Delhi-based Centre for Science and Environment revealed that the WRI had arrived at this conclusion by apportioning the annual GHG absorption by the world's natural "carbon sinks" between countries on the basis of the amount they were already emitting, instead of on a per capita basis.[4] What angered them most was the implicit assumption that the rich nations had a right to pollute because they had "got there first." Opposition to any acceptance of any such status quo

[3] World Resources Institute. *World Resources 1990-1991: A Guide to the Global Environment* (New York: Oxford University Press, 1991).
[4] Agarwal, Anil and Sunita Narain. *Global Warming in an Unequal World: A Case of Environmental Colonialism* (New Delhi: Centre for Science and Environment, 1991).

therefore became the cornerstone of the Indian position at Rio in 1992 and at Kyoto in 1997. It remains the centerpiece of Indian policy today.

RECOGNIZING THE NEED TO COUNTER CLIMATE CHANGE

The first signs of a shift in attitude in India came in the National Action Plan on Climate Change (NAPCC) that the government released on 30 June 2008.[5] Pointing out that India's per capita emissions of CO_2 were only 1.02 metric tons against a global average of 4.25 metric tons and a US average of more than 20 metric tons, it reasserted that India would not sacrifice its future development for the sake of lowering global GHG emissions. India, it said, was prepared to do its bit by shifting some of its energy base to renewables, improving energy efficiency, and adopting sustainable practices in the development of agriculture and the urban habitat. If the international community wanted a faster pace of reduction in carbon emissions, it would have to help by providing the required resources and technology.

But the most important departure from earlier positions went virtually unnoticed. This was a commitment by the prime minister when he was unveiling the plan not to allow India's per capita GHG emissions to exceed the average per capita emissions of the OECD countries. The implications of this commitment went unnoticed in India and were later derided by the international media as a typical "in your face" gesture by India. But PM Singh made the commitment in the context of a long-term convergence of per capita emissions. In short, the more the OECD countries brought down their emissions, the less India would allow its emissions to rise.

After the Hokkaido summit, the prime minister's position underwent a further change. This change took the form of a widening search for technology alternatives. In a private directive to his climate envoy Shyam Saran, the prime minister asked Saran to step up the search for ways in which India could reduce its CO_2 emissions without sacrificing growth. One result of this was the announcement in July 2009 of a sharp increase in the target for solar power generation from 1,000 megawatts (MW) in the NAPCC to 20,000 MW by 2020.

THE CONFRONTATIONAL NATURE OF NEGOTIATIONS

These efforts notwithstanding, India's discussions with the US and EU have been anything but smooth. The reason has been the confrontational nature of the

[5] Prime Minister's Council on Climate Change. *National Action Plan on Climate Change* (New Delhi: Government of India, 2008).

negotiation process itself. Following the template laid down in the United Nations Framework Convention on Climate Change (UNFCCC), the negotiators covered four main issues: Mitigation, Adaptation, Finance, and Monitoring, Reporting, and Verification (MRV). On none of these did OECD countries and India come even close to an agreement.

Indians regard the commitments being made by the industrialised countries on CO_2 reductions with deep skepticism. In June 2008, the G8 summit at Hokkaido accepted the target of a 50 percent reduction in emissions by 2050 but did not specify a base year for the calculation of the reductions. When the Waxman-Markey bill – which was passed by the House of Representatives on 25 June, 2009 – specified 2005 for this purpose, it confirmed the suspicions of bad faith that Indian environmentalists had been harboring since the negotiations began. If this became the de jure or de facto norm for the OECD countries, it would in effect bury the Kyoto Protocol and Kyoto's goal of reducing emissions by 5.2 percent below 1990 levels.

Indian public opinion also shares New Delhi's reservations about the cap-and-trade method of emission reduction. Its objections are both moral and practical. The system cannot work if all parties to it do not first accept hard carbon emission caps. But that means accepting the present level of emissions – and therefore the present level of income disparity between the rich and poor nations – as the starting point for setting emission caps. The OECD's insistence on the cap-and-trade system has therefore strengthened the suspicion that OECD countries do not really believe the dire predictions they are making about the future of the planet.

The gulf that divided India and the OECD countries on finance was equally wide. The US has stated categorically that it is not in any position to provide public funding for any mitigation activities in developing countries. Developing countries would have to tap international financial markets for funds and this, in turn, meant taking commercial loans. EU negotiators, by contrast, were not against some public funding and proposed that funds could be raised through carbon credit auctions. But India argued that the sums that could be raised in this way would be totally inadequate.

This deadlock was broken at the Major Economies Forum meeting which followed the L'Aquila G-8 summit in July. In it, the larger developing countries accepted for the first time the need not only to confine the rise in temperature to 2 degrees Celsius, but also that this would require their CO_2 emissions to peak in absolute – and not per capita – terms in the near future. For their part, the

industrialized countries moved away from their prior rigid stance on financing the reduction of CO_2 emissions in developing countries and accepted in principle British Prime Minister Gordon Brown's suggestion that there had to be a large transfer – possibly of as much as US$ 100 billion a year – to developing countries to meet the added cost of low carbon and renewable energy technologies.[6]

The Indian media were confused by this shift in attitude. Most took the position articulated by *Down To Earth*, India's most widely-read magazine on science and the environment:

> The problem with the L'Aquila declaration is not that it caps the increase in temperature, but that it does not make explicit this limit will require sharing the (carbon) budget equally between nations who [sic] have already used up their common atmospheric space and new entrants to economic growth. Without budget-sharing the temperature cap becomes a virtual cap on the emissions of the developing world.[7]

CONCLUSION

The world has made a historic error – perhaps beginning as far back as the Rio conference – that has led to India's consistent suspicion of OECD intentions. The error was the decision to negotiate environmental issues – including climate change – through confrontational negotiations instead of through other mechanisms that could foster unstinting cooperation. Further, no one has proposed a viable means of preparing for the shifting of society's energy base from fossil to non-fossil fuels. This is the "black hole" at the center of the climate change discussions and it is getting bigger all the time.

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[6] "Declaration of the Leaders of the Major Economies Forum on Energy and Climate," 9 July 2009, at http://www.g8italia2009.it/static/G8_Allegato/MEF_Declarationl.pdf.

[7] Narain, Sunita. "Who's Afraid of 2°C?" *Down to Earth*, 31 August 2009.

INDIA'S ROLE IN CONFRONTING CLIMATE CHANGE:
FROM VULNERABILITY TO OPPORTUNITY

Malini Mehra

India is on the frontlines of global warming. In a recent estimate, the World Bank suggests that the developing world will suffer 80 percent of the damage from climate change despite accounting for only one third of greenhouse gases in the atmosphere.[1] India is a case in point. The country is now the fourth largest emitter of greenhouse gases (GHGs) in the world and accounts for 5 percent of global GHG flows. But with 1.1 billion people – or a population of just under one sixth the global total – its per capita emissions are a mere 1.7 tons of carbon dioxide equivalent (CO2e) per capita, compared to 23.5 tons CO2e per capita for the US. It has a significant aggregate footprint with an insignificant per capita footprint. Neither fact diminishes its climate vulnerability.

Daily reports in India's newspapers underline the country's vulnerability to global warming-induced changes in rainfall patterns, agricultural yield, glacier melt, floods, cyclones, disease prevalence, and extreme weather events. These are all consistent with international studies such as those of the Intergovernmental Panel on Climate Change (IPCC) that have underscored India's vulnerability to climate change. As a tropical country with a 7,500 km-long coast line, India is experiencing sea surges and salinization affecting infrastructure, agriculture, fisheries, livelihoods, and human health. The encroaching salt water is already poisoning fields and making coastal agriculture unviable. Salt is now being detected in growing quantities in lactating coastal women, making breastfeeding impossible and affecting the health of the next generation.

These impacts cross geographies and urban-rural divides throughout this vast subcontinent. Climate impacts are manifest: From India's northern tip of Kashmir, where rising temperatures are playing havoc with local tourism and agriculture; to the Sunderbans in its East, where people, mangroves, and tigers are all suffering; to the rising waters of the Bay of Bengal; to India's western metropolis of Mumbai with its 0.5 degree climb in the local temperature in just the past few years; and to Kochi in the South, where rising temperatures are

[1] World Bank. *World Development Report 2010: Development and Climate Change* (Washington DC: World Bank, 2009).

unsettling the local crop economy. Extreme rainfall events have occurred with significant human and economic loss in major cities and states such as Mumbai (2005), Bihar (2008), and Karnataka (2009). Experts are now expecting one of the worst floods in Kashmir's history as a result of melting of Himalayan glaciers.[2] These impacts alone could severely test India's governance systems and its institutional and social resilience. Unless dealt with effectively, they could also quickly turn into political challenges.

For the 700 million people in rural India who are dependent on the most climate-sensitive sectors for their livelihoods – agriculture, forests, and fisheries – the future will bring declining crop yields, degraded lands, water shortages, and ill health. It will also bring confusion and helplessness as people lose their traditional capacity to "read" the weather and adjust accordingly. When the rains do not come and when the natural world does not behave as it should, societies which have survived by observing the world and adapting to it lose essential coping skills. Therefore climate change, at a most profound level, will disempower India's vast rural poor by rendering traditional knowledge useless.[3]

CLIMATE CONFLICTS

It will also bring conflict. India is acutely resource-dependent, reliant on the monsoon for food security and Himalayan glacier melt for water security in many regions. The destabilization of both – as projected by climate models and observed trends – will spell conflict as communities vie for access to scarce natural resources, including arable land to grow food. India already has the largest number of insurgencies of any country, a fact well-concealed from international debate. Many of the resource-conflict hot spots such as in the Eastern and Northeastern parts of the country are already regions with well-established political insurgencies.

The costs of climate change are currently being counted in rupees and paisas. The Indian government says that it is already spending 2.6 percent of its annual gross domestic product on adapting to the impacts of climate change. Military analysts suggest that the frequency of flooding in South Asia has doubled in the last thirty years, leading to an economic loss of US$ 32 billion.[4] In coming years, however, the costs could well be measured not just in compromised development, but also in serious military conflict and loss of life as societies become overwhelmed by the scale and pace of climate-induced destabilization. At present, India resorts to calling in the army when natural disasters overwhelm

[2] Shafi Wani, Arif. "Valley's Erratic Climatic Change Worries Experts," *Greater Kashmir*, 5 October 2009.
[3] Mehra, Malini. "Climate Change: Why India Must Take Leadership," Centre for Social Markets, August 2007.
[4] Air Marshall AK Singh. "Impact of Climate Change on India," presentation, March 2009.

the response capabilities of civilian authorities. Given the increasing frequency of cyclones, floods, and other natural disasters, India is already placing a great strain on its defense services – disrupting the training that is required to keep them in form – and diverting them from their traditional duties. Such opportunity costs have not been fully appreciated by the country's policymakers.

The future can be seen in the borderlands of India and Bangladesh. For many years, India has been fighting a losing battle against incursions of narcotics, smuggling, and people it calls "illegal economic migrants"—Bangladeshis crossing the border in search of a better life. India's response to the incursions has been to build a 2,500 mile fence between the two countries at a cost of up to US$ 1.2 billion.[5] If a fence is India's response to a few hundred thousand people illegally crossing borders, what will its response be when there are massive climate-induced movements of people across borders? Both India and its neighbors are vulnerable to sea level rise and extreme weather events—Bangladesh catastrophically so. It is estimated that rising sea levels and water shortages will displace about 125 million people living along the coasts of both countries by the end of the century.[6] Will a fence suffice then? Probably not.

Bangladesh provides arguably the most vivid example of how climate risks should give pause to India's policymakers. Climate change is, however, still being conceived in traditional environmental terms, not as a complex, geostrategic issue that will have impacts on multiple levels and could fundamentally alter the balance of power internally as well as internationally.[7] In other words, the issue is not being conceived as climate security.

The adage coined by Sir David King that climate change will redraw borders appears not to have sunken in: India is already engaged in border conflicts or security issues with at least three of its neighbors (Pakistan, Bangladesh, and China) which has led to tensions in the region, communal conflict, and drains on the national exchequer. Another crucial set of lessons that have not sunken in are the findings of a committee of retired US military officials that studied the relevance of climate change to the US's strategic and security interests. The conclusions drawn by this landmark study should make compelling reading for India's policymakers:

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[5] Prasad, Raekha. "India Builds a 2,500-mile Barrier to Rival the Great Wall of China". *The Times*, 28 December 2005, at http://www.timesonline.co.uk/tol/news/world/asia/article782933.ece#.

[6] Chella Rajan, Sudhir. *Blue Alert - Climate Migrants in South Asia: Estimates and Solutions* (Bangalore: Greenpeace India Society, March 2008).

[7] Mabey, Nick. *Delivering Climate Security: International Security Responses to a Climate Changed World*. Whitehall Paper 69 (London: Royal United Services Institute, 2009).

1. Projected climate change poses a serious threat to America's national security;

2. Climate change acts as a threat multiplier for instability in some of the most volatile regions of the world;

3. Projected climate change will add to tensions even in stable regions of the world; and

4. Climate change, national security, and energy dependence are a related set of global challenges. [8]

TOWARD CLIMATE SECURITY

These lessons are as pertinent to India as they are to the US. They reaffirm what more far-sighted observers have been saying about the challenges that will be posed to domestic and foreign policy: "Climate change geopolitics will extend far outside the environmental sphere, and will link old problems in new ways. Managing the complexity of our collective climate security will become an ever more important part of foreign policy."[9]

For India, the challenge starts with moving climate change out of the environment box. Climate change must be seen as a fundamentally transformative new "system condition" that nations must adjust to at multiple, challenging levels. Once this is done, the optic will change and the necessary connections with economic competitiveness and "harder" defense issues – which garner greater political attention and resources – will be easier to make. Work has begun at defense think tanks which now are taking the first steps to address the issue. This is a welcome move and efforts must now accelerate. The priority must be to avoid knee-jerk returns to military mindsets that could engulf the region in a futile arms race as control over resources and border security become paramount. Equally of concern will be the need to foster openness and democratic debate—to *not* give in to well-established cultures of official secrecy when perceived "sensitive" issues of national security are at stake. If India is to avoid an insecure and unstable future, one of her best defenses could be to invest in informed debate and practice now. Such steps can help to build the social

[8] Military Advisory Board. *National Security and the Threat of Climate Change* (Alexandria, VA: The CNA Corporation, 2007) at www.securityandclimate.cna.org.
[9] Mabey, Nick. *op. cit.*, p.7.

resilience that will be needed as much as physical resilience when climate impacts begin to intensify.

After more than a decade of climate change being framed in India as someone else's problem, it is time to move on. India must look to and prepare for a future which, in many respects, will be grimmer and more challenging than the world we face now. In a world of tipping points and abrupt climate change, there will be no linear development pathways. If we think the past has been uncertain, the future will be even more so.

The challenge for governance has never been greater. We need to move from a bi-polar, uni-polar, and multi-polar world to an inter-polar world recognizing the interdependence of nations. Notions of national security will need to be redefined in an era of climate insecurity. There will be a need for greater international cooperation. There will be a need for greater political leadership. Can India provide that? We are now in the major league of nations. It is time to show that we can.

FROM "OBSTRUCTIONIST" TO LEADING PLAYER:
TRANSFORMING INDIA'S INTERNATIONAL IMAGE

Udit Mathur and George C. Varughese

India is a key player in the climate negotiations to reach a deal at Copenhagen. In recent months, it has clearly demonstrated willingness to reach a "good" deal rather than the "best" one, as pointed out by Dr. Jairam Ramesh, Indian Minister of State for Environment and Forests.[1] The domestic social realities and consequent political obstacles underlying India's tough negotiating stance need to be recognized.

It is fairly well recognized within India that the country is acutely vulnerable to climate change. Impacts on water will be critical, with a less predictable and weaker monsoon impacting 65 percent of the population that depends on agriculture. With fewer but more intense periods of rainfall, there will be increased flooding. And the Himalayan glacier melt will put at risk irrigated agriculture and river-fed urban water supplies. Food production will fall and health impacts are likely to be severe. Lives and livelihoods of approximately 2.7 million families will be threatened by sea level rise, storms, and cyclones. On the adaptation side, it is claimed that India already spends "over 2 percent of its GDP on adaptation and this figure is likely to go up significantly."[2] Therefore, "the Copenhagen package must include global action on Adaptation in addition to action to GHG [greenhouse gas] abatement and reduction."[3] India and China have thus argued that adaptation funding has to be available before developing countries agree to other actions.

On the GHG mitigation front, India advances an argument for equity. Equity is not just a negotiating stance for India but a strongly felt moral imperative. With almost 456 million people below the international poverty line[4] (roughly 19 percent more than in the whole of Sub-Saharan Africa), four infant deaths a

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[1] Council on Foreign Relations. "India's Climate Change Forecast". Interview with Jairam Ramesh, 22 September 2009, at http://www.cfr.org/publication/20248/.

[2] Quoted in *India Climate Watch*, Edition 1, March 2009, at http://www.climatechallengeindia.org/India-Climate-Watch/.

[3] Public Diplomacy Division. *The Road to Copenhagen: India's Position on Climate Change Issues* (New Delhi: Ministry of External Affairs, 2009), at http://www.indiaenvironmentportal.org.in/files/climate_0.pdf.

[4] Chen, Shaohua and Martin Ravallion. *The Developing World is Poorer than We Thought, But No Less Successful in the Fight Against Poverty*, Policy Research Working Paper 4703 (Washington, DC: World Bank, August 2008).

minute, and a maternal death every four minutes,[5] poverty is chronic. Four hundred million people have no electricity and for many others it is not available when required the most.[6] Consequently, the key Indian voices resist any suggestion of action on climate change which could hamper the fight against poverty and energy insecurity—at least without compensating finance and suitable technologies from the West.

Within this frame of realities lies the Government of India's official stance. India's official position is based on the principle that long-term convergence of per capita emissions is "the only equitable basis for a global compact on climate change."[7] It is based on the belief that no negotiations are possible without addressing the egregious equity issues due to the historical burden placed on poor countries by industrialized countries—contributors of roughly 72 percent of current GHG concentrations of 380 parts per million. Additionally, these industrialized countries continue to emit at per capita rates that are multiples higher than those of poor countries like India. Even so, some developed countries are calling on India to shoulder binding quantitative emissions targets, demands that New Delhi clearly resists. Yet Indian representatives are adamant that the official position is not a negative attitude. Rather, it is the North which has yet to demonstrate that it is serious about climate change by making tangible cuts in its emissions—only then may India consider joining a treaty at Copenhagen.[8]

INDIA'S UNILATERAL ACTIONS

Patchy delivery on the Kyoto Protocol commitments by the Annex I countries further fuels Indian unwillingness to accede to any demands for emission reductions by developing countries. Political leaders and bureaucrats within the country, however, have increasingly shown that the issue of climate change is being considered with a comprehensive view of the gains and trade-offs involved in various strategies and actions. In line with this, the country has on its own started taking unilateral mitigation cuts over the next fifteen to twenty years as a part of its development process—without, it must be said, jeopardizing economic growth. Some of the domestic measures that have been announced include:

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[5] UNICEF. *The State of The World's Children 2009: Maternal and Newborn Health* (New York: UNICEF, 2008).
[6] World Bank. *World Development Report 2010: Development and Climate Change* (Washington, DC: World Bank, 2009).
[7] Prime Minister's Speech on Release of Climate Change Action Plan 30 June 2008. Transcript can be found at http://pmindia.nic.in/speech/content.asp?id=690.
[8] Kapur, Devesh, Radhika Khosla, and Pratap Bhanu Mehta. "Climate Change: India's Options". *Economic & Political Weekly*, Vol.54, No.31 (2009).

- The National Solar Mission, which sets targets of 20,000 megawatts (MW) of solar capacity by 2020, 100,000 MW by 2030, and 200,000 MW by 2050—to be achieved through regulatory/policy measures such as feed-in-tariffs, renewable purchase obligations, capital subsidies, and tax holidays;

- A new Renewable Energy Law is being planned that would stipulate mandatory procurement of prescribed minimum renewable energy in each state. The move is aimed at diversifying the country's energy mix that is dominated by oil, gas, and coal as basic fuel feed;

- Forestry, where India's recent announcements (to increase from the current 23 percent cover to 33 percent) put them on a track to sequester 15-20 percent of India's total emissions by 2020;

- The National Mission for Enhanced Energy Efficiency, which by 2015 will help save about five percent of annual energy consumption and nearly 100 million tons of carbon dioxide equivalent every year. This is to be achieved through a cap-and-trade mechanism in energy efficiency, announced as a "Perform, Achieve and Trade" scheme.

These measures are highly ambitious and fairly strategic in nature, as India in any case has to take them for its rapid development. As Shyam Saran, India's Special Envoy of the Prime Minister on Climate Change, indicated: "The kind of things that you need to do in terms of energy security are precisely the things that you need to do to deal with climate change."[9] The country is therefore clear that, initially, these will be the areas where India will unilaterally move ahead and that the developed countries need to provide adequate technology and finance support to make it happen.

These measures have also indicated to the international community that India wants to be a part of the international solution to climate change. India's Prime Minister, Manmohan Singh, characterizes the country's energy efficiency efforts as sending "a powerful signal to the international community that we are willing to contribute in a significant manner to meeting the global challenge of climate change."[10]

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[9] "India is Doing a Great Deal on Climate Change: Saran," *The Dernogalizer*, 25 July 2009, at http://madrad2002.wordpress.com/2009/07/25/india-serious-about-climate-change/.

[10] "National Mission on Enhanced Energy Efficiency Approved," *The Hindu*, 25 August 2009, at http://beta.thehindu.com/news/national/article8498.ece.

Having undertaken proactive policies in the last year and having made considerable efforts to communicate them, India has managed to erase somewhat the impression that it represents an "obstruction to a climate deal" as it had been painted by many countries. Often, however, the seemingly pragmatic focus of the Annex I states on the reality that all countries need to act fast misses the Indian moral arguments, leading to frustration on both sides. It is therefore now the turn of the Annex I countries to recognize their historical responsibility and make a radically enhanced offer of mitigation effort and finance.

THE WAY FORWARD

As many analysts have pointed out, India has historically been more comfortable with negotiations when it is defending its moral entitlements (e.g., in the WTO on issues of stonewalling by developed countries against granting full market access to the exports of poor countries and instead demanding serious concessions from developing countries.) And in these negotiations, India has often stood its ground well. But one of the consequences of India's traditional negotiating position is that it has seldom been strong at bargaining. A moral entitlement approach to negotiation and a bargaining approach to negotiation require two very different sensibilities. The former requires sticking to a principle, even if the outcome is deadlock or isolation. The latter requires cutting deals, even if they are not based on the most equitable moral principle.

While India's position so far has been largely articulated in the language of entitlements, recent statements by Indian leaders in international meetings have indicated a shift towards the bargaining style. This is understandable, since many of the major countries in the G77 block such as Brazil, Argentina, and China have shown signs of being willing to give and take as well on crucial issues like emission reductions, Monitoring, Reporting, and Verification (MRV), and Reduced Emissions on Degradation and Deforestation (REDD). Agreement between India and China to coordinate and calibrate their positions before every major international gathering on climate change – and not to accept legally-binding targets on emissions reductions that may impact their development priorities – shows that India does not plan to let itself be sidelined during the central deal. But India's negotiators will keep open the option of a veto at Copenhagen if confronted with what they regard as an unreasonable outcome. It would not be difficult to sell this decision domestically by highlighting how little India has contributed to the problem and how pressing its development needs are.

Therefore, using a combination of moral entitlements and bargaining positions, India needs to convince the Annex I countries on certain issues, although dealing with different Annex I countries differently. India should:

- **Build a case for supporting low carbon development:** While the focus on development needs to be continued, India ought to come up with workable proposals on mechanisms for support by Annex I countries on increasing the focus on what sustainable, low carbon development looks like in practice and enhancing adaptation capabilities. A joint effort with the other BRICs (Brazil, Russia, India, and China) countries will be a very significant step in this regard.

- **Build estimates of the Adaptation Financing required:** While many estimates are already available for the volume of adaptation financing needs, none of them are country-specific. India needs to develop its own estimates for adaptation funding requirements so as to build up a convincing case for its demand for an adaptation funding and technology package. Deeper insights into utilization of this financing for various activities globally (e.g., Insurance, Conditional Cash Transfers, integration into government programs, early warning systems, etc.) are likely to be very useful in extracting commitments from developed countries.

- **Build a national debate on climate change commitments**: Given the wide ramifications of climate change issues and the domestic impacts of any treaty agreed upon in Copenhagen, debates need to expand beyond Delhi. A more participatory debate involving political representatives, civil society actors, and the bureaucracy (both at the national and sub-national level) is needed to build a national consensus. A better knowledge base and a more inclusive debate will allow India to take a more informed view of climate change both domestically and internationally and build broader support for implementing what are bound to be difficult options. It also presents an opportunity for India to rethink its development strategy and to formulate one that is more inclusive and less resource-intensive.

CLIMATE POLITICS IN INDIA:
HOW CAN THE INDUSTRIALIZED WORLD BRIDGE THE TRUST DEFICIT?[1]

Navroz K. Dubash

In an ironic and to most Indians quite disturbing turn, India is increasingly portrayed as an obstructionist in the global climate negotiations.[2] How did a country likely to be on the frontline of climate impacts – with a vast proportion of the world's poor and a reasonably good record of energy-related environmental policy and performance – reach this diplomatic *cul de sac*? Part of the answer lies in the posturing of climate diplomats from India and industrialized countries. But looking beyond the cut and thrust of climate diplomacy, Indian climate policy and the reaction to it are a salutary case study in the failure to build North-South trust in the climate negotiations.

Exploring questions of trust requires recognizing that India, too, has domestic politics around climate change. While there is considerable convergence within India on the climate problem, this does not translate to strategic unanimity on a negotiating position. I suggest that there is a vocal – if narrow – segment that supports a proactive Indian approach to climate negotiations. But these voices of global cooperation are being undercut by the increasingly toxic global negotiating context.

HOW DOES INDIA LOOK AT THE CLIMATE PROBLEM?

There are three reasons why few in India believe the global negotiations can deliver an outcome that is both environmentally effective and fair. First, India is being unfairly labelled a "major emitter." Second, given the country's unfinished development agenda, discussing constraints on India are premature. Third, there is insufficient recognition that India is moving proactively on climate mitigation and is starting from a very low base.

India: A major emitter or a disadvantaged latecomer?

Two competing perspectives define what constitutes a "major emitter." If climate change is considered a problem of controlling current flows of

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[1] This article is an abridged version of an article by the author released as a Centre for Policy Working Paper 2009/1 (September) "Toward a Progressive Indian and Global Climate Politics" available at www.cprindia.org and is printed here with the permission of the Centre for Policy Research.

[2] See, for example, "China, India and Climate Change: Melting Asia," *The Economist*, 5 June 2008.

greenhouse gases into the atmosphere, India must be deemed a "major emitter." India now emits about 5 percent of global greenhouse gases, ranking fourth in the world.[3] Increasingly, Indian observers publicly recognize this fact.[4]

But framing the problem as one of allocating responsibility for the total accumulation of greenhouse gases over time – a problem of allotting finite "development space" – places India in another light. India has contributed only about 2.3 percent of global stocks of greenhouse gases while the industrialized countries of Annex I collectively account for about 75 percent and the US alone for 29 percent.[5]

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) tilts toward the latter view, stipulating that industrialized countries should "take the lead" in combating climate change in part because of their greater responsibility for the problem.[6] With a few honourable exceptions, however, Annex I countries have fallen woefully short of taking the lead.[7] Between 1990 and 2005, for example, US emissions rose by 16 percent.[8]

Equity: Who is hiding behind whom?

The UNFCCC establishes "responsibility" and "capability" as the bases for determining who should act and when.[9] Beyond arguing that its responsibility is less than is frequently asserted, India also pleads weak capability. Critics – including internal critics – suggest that India is "hiding behind the poor."[10] Yet if India is indeed still a substantially poor country, then conditioning Annex I actions on Indian emissions reduction efforts is tantamount to the industrialized world hiding behind India's rich.

Despite India's recent economic strides, the unfinished development tasks ahead remain tremendous. India has an extremely poor bottom third —27.5 percent are below the official poverty line of about US$ 0.70 a day in rural areas and US$

[3] Emissions exclude land use change. Figures drawn from http://cait.wri.org/.
[4] Raghunandan, D. et al. *Climate Crisis: Challenges and Options* (New Delhi: All India Peoples Science Network and Centre for Science Technology and Society, Tata Institute of Social Science, December 2008).
[5] See http://cait.wri.org/.
[6] United Nations Framework Convention on Climate Change (UNFCCC), Article 3.1.
[7] Due to US inaction over the last decade, even legislation now being discussed will only return the US contribution to global stocks to their Kyoto levels (levels meant to be reached by 2012) by the mid-2030s. This two-decade delay comes directly out of what developing countries could emit, if we are to stay within a global carbon budget. See Singh, Daljit, Girish Sant, and Ashok Srinivas. "Developed Countries' Response to Climate Change: Separating the Wheat from the Chaff," *Economic and Political Weekly*, Vol.44, No.5 (2008).
[8] http://cait.wri.org/.
[9] UNFCCC, Article 3.1.
[10] Greenpeace India. *Hiding Behind the Poor* (Bangalore: Greenpeace India Society, October 2007).

1.05 a day in urban areas (purchasing power parity [PPP] adjusted 2004-05.)[11] They are likely to contribute little to global emissions.

Surprisingly, neither is most of the rest of the population. Only 11 percent of Indian households consume more than 100 kilowatt hours of electricity while the average in the US is five times higher.[12] Meanwhile, more than 99 percent of Indians fall below the American poverty line of US$ 13 a day.[13] Indeed, only between 3 and 6 million Indians would be considered "middle class" or above in American terms and the rest would be categorized as "poor."[14] Even allowing for measurement errors and the existence of a large parallel "black" economy, this number is unlikely to exceed the low tens of millions. While much ink is spilt on the emergent Indian middle class, defined relative to Western terms this group is still vanishingly small and likely to remain quite marginal to global emissions.

Certainly India is getting richer. But the overwhelming majority of Indians are doing so starting from a very low base and many have not yet seen any of the gains. This is why Indian policy justifiably continues to emphasize per capita emission levels. At 1.7 tons CO_2 per capita in 2005, India's emissions were but a fraction of the Annex I average of 14.1 tons, China's emissions of 5.5 tons CO_2 per capita, and only 7 percent of US emissions of 23.5 tons CO_2 per capita.[15]

To be sure, internal equity matters as much as equity across countries. To credibly place equity arguments at the core of its international position, India cannot continue to sustain gross internal inequalities in emissions. Yet if India is to be constructively engaged, the international community must understand that the burden of poverty in India continues to be massive. To do otherwise would be to hide behind India's relatively few rich.

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[11] Computed by the author from Government of India, Press Information Bureau. *Poverty Estimates for 2004-05* (New Delhi: 21 March 2007).

[12] Sant, Girish, Narasimha Rao, and Sudhir Chella Rajan. "An Overview of Indian Energy Trends: Low Carbon Growth and Development Challenges," Prayas Energy Group, Prayas-Pune, August 2009, at www.prayaspune.org.

[13] Ravallion, Martin. "The Developing World's Bulging (but Vulnerable) Middle Class," Development Economics Group Policy Research Working Paper 4816, January 2009, p. 7.

[14] The broad range accounts for some concerns about the under-counting of Indian consumption levels. Ravallion suggests that even with a 50 percent measurement error, the number of Indians above the US poverty line of US$ 13 a day rises only from 3 to 6 million.

[15] Computed from http://cait.wri.org/.

Burden sharing versus opportunity seizing: How much is India doing, anyway?

Equity and development criteria frame emissions mitigation as an obligation to be shared. Another viewpoint argues that climate mitigation also presents an opportunity.[16] From this perspective, there is no real trade-off between poverty alleviation and climate mitigation.

Many sustainable development policies clearly benefit the poor – such as promotion of public transport – and end up achieving both objectives. But there are areas of development where trade-offs may be considerable. India cannot upgrade its infrastructure of roads, ports, electricity capacity, and urban spaces without increases in emissions. Yet not doing so would constitute a failure to improve living circumstances for millions of poor Indians. With little evidence that the North itself is chasing climate opportunity, many in India thus temper talk of climate opportunity with a heavy dose of caution.

The National Action Plan on Climate Change (NAPCC) follows this approach.[17] It commits India to pursuing opportunities without binding the country to realizing those objectives. Why this approach should be appropriate for India but not for the industrialized countries hinges on two earlier points—the appropriation of development space and the low current levels of development. However, Indian negotiators are at pains to point out that India is making considerable progress anyway toward a lower carbon society.[18] In 2006, India's energy intensity was about half that of China's, lower than the US, only slightly higher than the EU's, and on a declining trajectory. While industry grew at about 6-7 percent annually from 1990 to 2005, energy use for industry rose a more sedate 3 percent (suggesting a de-linking of growth and energy use.)

High price levels of electricity and petroleum products help explain this performance. In PPP terms, industrial tariffs for electricity are twice as high as in China and four times as high as in the US. Similarly, retail prices (PPP) of gasoline in India are double those in China and four times the US price.[19]

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[16] This point of view is most vigorously argued by the Centre for Social Markets, www.csmworld.org.

[17] Prime Minister's Council on Climate Change. *National Action Plan on Climate Change* (New Delhi: Government of India, 2008).

[18] This information is gleaned from a recent paper summarizing Indian energy trends by a set of independent scholars. See Rao, Narasimha, Girish Sant, and Sudhir Chella Rajan. "An Overview of Indian Energy Trends: Low Carbon Growth and Development Challenges," Prayas Energy Group, Pune India, August 2009.

[19] Sant et. al. op. cit.

The government has also moved to increase the economy's energy efficiency, notably through the National Mission for Energy Efficiency within the NAPCC. This mission includes a labelling programme for household appliances, energy efficiency targets for large consumers with a provision for the trading of certificates, and concessional financing for energy efficiency projects.[20]

THREE STRATEGIC PERSPECTIVES

A great deal of commonality in perspectives within India does not translate into unanimity over strategy. I identify at least three different strategic perspectives.

Growth-First Stonewallers: It's our turn now!

Growth-first stonewallers consider the climate negotiations themselves a containment strategy by industrialized countries that is more threatening to India than climate impacts. Frequently skeptical of climate science, they see the threat of reduced growth and development from climate obligations as swamping the cost of climate impacts. Equity across nations is their foundational demand—in part out of principle, but also as a useful strategic device to hold industrialized countries at bay. Their priority is to continue India's recent high growth rate. Stonewallers would prefer a weak climate regime that allowed India unconstrained growth over a stronger regime even it if required industrialized countries to do proportionately more.

Progressive Realists: It's an unfair world!

Progressive realists view prospective climate impacts as a serious threat to India. However, they are deeply cynical about the international process. They cite the failure by Annex I countries to take seriously their historical responsibility – evidenced by limited mitigation actions and minimal financing offers – and their failure to seriously engage equity issues as justifying this cynicism. The growth of India and China, progressive realists suggest, has become an excuse for inaction by industrialized countries.

Their inability to advance an equity perspective – especially when combined with a perception that the North is hiding behind India – has bred fatalism about the climate negotiations. Consequently, progressive realists have increasingly focused their energies at home. They urge a more environmentally-sound development path through the pursuit of "co-benefits" at home—strategies that

[20] See the National Mission on Enhanced Energy Efficiency, available at http://indiaenvironmentportal.org.in/content/national-mission-enhanced-energy-efficiency-nmeee-note.

are shaped by domestic priorities but also bring climate gains. Lacking faith in the international regime, this group increasingly argues for India to do its part but not to formally link these efforts to the international process.[21]

Progressive Internationalists: Seize the moment!

Progressive internationalists share many of the attitudes of the progressive realists. Both groups suggest that the rich world is using India as an excuse for inaction, stress the need for an equitable climate regime, and argue strenuously for the aggressive implementation of actions that bring development and climate co-benefits.

However, the internationalists believe India can and should advance the global negotiations by explicitly aligning Indian interests with an effective global climate regime. This linkage, they suggest, will allow India to seize the moral high ground and explicitly throw India's weight behind a common global solution.[22] Progressive internationalists argue that since climate impacts will hurt the poor worst, an ineffective agreement would in effect perpetuate and exacerbate inequality. Hence, the alleged choice between equity and effectiveness is misleading — there is no choice but to strive for both. Finally, they are more likely than others to see the potential economic opportunities for India that stem from being first movers in developing low-carbon technologies.

What do government, civil society, and business think?

The Government of India has historically been dominated by growth-first stonewallers, although there have always been dissenting voices. But in the last year there has been a discernable shift in tone toward the progressive realist camp. India's NAPCC, for example, aims at a "qualitative shift" in development trajectory toward greater environmental sustainability as a way of realising co-benefits. India has also started discussing voluntary national legislation to curb greenhouse emissions through five targeted measures.[23] Nevertheless, the government is adamant that in the current diplomatic climate – with little sign of meaningful action or good faith by the industrialized world – these measures

[21] This stance has a long history in India. A wariness of the international process was apparent even during negotiation of the UNFCCC. See Agarwal, Anil and Sunita Narain. *Global Warming in an Unequal World* (New Delhi: Centre for Science and Environment, 1991).
[22] D. Raghunandan et. al., op. cit.
[23] Ghosh, Padmaparna. "India Mulls Law to Cap Emissions" *Mint*, 12 September 2009, at http://www.livemint.com/2009/09/11234746/India-mulls-law-to-cap-emissio.html.

would be unilateral rather than linked to a global regime. This is a realist strategy.

Indian business has increasingly emphasized the need to treat the climate challenge as a commercial opportunity.[24] But they would rather pursue this opportunity free of the obligations and possible constraints of an international regime. Thus, while they would like clear regulatory signals from the government, they tend to be on the side of progressive realists and seek domestic action de-linked from global commitments.

Indian civil society – disenchanted with the global process – is dominated by the progressive realist view.[25] While they may be fierce critics of the government at home, they close ranks with them at international climate negotiations and defend against calls for international commitments of any sort. However, some members of civil society have adopted the progressive internationalist position after becoming increasingly uncomfortable with the implications of the government's position for the poorest Indians—they face an uphill task in India. There are few takers for an argument that a shift in India's position can do much to change entrenched global positions. They are met with charges of naiveté and a prediction that Indian offers will lead only to more constraints on national development and no improvement in the global regime. Unlocking progressive climate politics in India will require building faith in the prospect of more progressive global climate politics.

CONCLUSION: TOWARD BUILDING TRUST

Indian climate politics is trapped between two mutually-reinforcing outcomes. First, India has been labeled an obstacle to successful negotiations. But India's official position reflects mainstream Indian opinion—an opinion which is shaped by attention to the historical responsibility of industrialized countries, attention to equity, and a strong domestic record of low-carbon development.

Second, "progressive internationalists" who argue that India's national interests are best served by a strong global climate regime are being undercut by the international process. The perception that many industrialized countries are downplaying their responsibility strengthens progressive realists and even growth-first stonewallers. This dynamic reinforces a perception of India as an obstruction to a global climate deal.

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[24] See, for example, Confederation of Indian Industry. *Building a Low Carbon Indian Economy*, Confederation of Indian Industry Discussion Paper, January 2008.

[25] Dubash, Navroz K. "Environmentalism in the Age of Climate Change," *Seminar*, September 2009, pp. 63-66.

While the *climaterati* dwell on the nuances of US politics, it is important to remember that other countries face political struggles over climate change as well. Progressive internationalists will continue to press the Indian government to take a more proactive and productive stance toward a global climate regime. But shifting to more progressive Indian climate politics will require support from a more progressive international climate politics in at least three ways:

- *Honor the UNFCCC bargain*: India is not alone among developing countries in suspecting that the US and some other industrialized countries are seeking to weaken the UNFCCC bargain to the breaking point. The essence of that bargain was that industrialized countries would move first to tackle climate change. Instead, the US (along with some other industrialized countries) has sought to make its actions conditional on those of large emerging economies, including India. By shaking the stick of border tax adjustments, the US signals that it has no intention of leading the response to climate change. While it is understandable that US lawmakers worry about economic competitiveness, this concern cannot be satisfied at the cost of abjuring the UNFCCC bargain. Aside from what it signals about US respect for international law, doing so would also signal that equity and responsibility – obligations of a nation that has emitted 29 percent of the greenhouse gases now in the atmosphere – play little role in US relations with the world.

- *Take equity concerns seriously:* Recognizing emissions per person as a valid indicator of the relative capacities of countries would be an extremely helpful trust-building step. India fears that without some internalization of the per capita emissions metric, future political pressures might well lead to Indian emissions being capped at a fraction of the per capita emissions of industrialized countries. An explicit statement of the need to narrow disparities in per capita emissions across countries – perhaps as part of the shared vision of a Copenhagen outcome – would help ameliorate this fear and open the door to more constructive engagement.

- *Create a supportive framework for bottom-up actions in the developing world:* By insisting that the global climate regime stipulate quantitative obligations for developing countries, industrialized countries risk discouraging rather than encouraging early climate mitigation in India. Many aggressive climate mitigation policies are already in place or in the pipeline in India. These policies are driven by the recognition that such policies can provide significant development co-benefits. Government, industry, and civil society increasingly agree on the desirability of a low-carbon Indian future, although debates certainly continue as to what this

future looks like and how fast we can reach it. But pressure to put a number on the cumulative effect of these actions encourages setting weak targets, inflating India's Business-As-Usual trajectory, and slowing down implementation until India can claim political credit for actions. Instead of insisting on quantitative targets that are equivalent to those of industrialized countries, promoting a supportive framework for bottom-up actions will yield far greater results in rapidly growing emerging economies such as India.

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India looms increasingly large in global climate policy debates. It is now one of the world's biggest emitters of greenhouse gases. But it is also one of the world's leading producers of renewable power. Perhaps 600 million of its citizens lack access to electricity, requiring India to vastly expand energy services to fuel economic development. At the same time, India's agricultural production and water resources are highly vulnerable to climate stresses. In this collection, nine Indian experts examine the multifaceted climate policy choices and challenges confronting the country in the run up to the international negotiations in Copenhagen and beyond.

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