Copenhagen and the 'BASIC' countries: some basic differences between the Indian and Chinese emissions*

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The Copenhagen Accord was cobbled together in hasty closed-doors consultations in the final hours of the failing climate meet by a select group of 26 countries. The Accord did not even get the imprimatur of the UNFCCC. Copenhagen failed to deliver a comprehensive and legally binding emissions reduction treaty.

Copenhagen succeeded in 'institutionalizing' the new entity of the BASIC group of countries, but fundamental differences exist in their emissions patterns, particularly between India and China. China is far ahead of India in total gross domestic product (GDP), annual rate of growth in GDP, carbon intensity of economy, aggregate and per capita emissions, rate of growth in emissions and the contribution its emissions make towards the current rate of build-up of CO_2 in the atmosphere. The climate burden of the Chinese economic growth on the rest of the world is disproportionately large compared to that of India. The climate interlocutors en route Mexico 2010 (CoP 16) should not ignore these 'inconvenient truths' about the Chinese emissions and economy and they should stop equating India with China when it comes to likely emissions capping, sooner or later. Exerting pressure on India to limit its emissions could be seen only as a covert political strategy to constrain its economic growth rather than gaining any substantial emissions reduction globally and it is convenient for the developed countries to put India together with China in the BASIC group for exerting such pressure. India should seriously reconsider its strategy of aligning with China on the emissions issue.

Keywords: BASIC countries, carbon intensity, Copenhagen Accord, energy use efficiency, environmental cost.

AFTER endless analysis, hype and anticipation, the 15th Conference of Parties (CoP 15) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Copenhagen during December 2009 came out with the Copenhagen Accord (see http://unfccc.int/files/meetings/cop_15/application/pdf/cop15-cph-aur.pdf for the text of the accord). With no teeth and nails or even the approval of the UNFCCC, the Copenhagen Accord delivered nothing on the substance: which all nations will reduce their emissions by how much and by when so as to limit global warming to less than 2°C as the meeting had resolved. Far short of meeting their Kyoto commitments (Table 1), the rich countries escaped without resolving how the atmospheric commons could be equitably shared with the poor nations. The two-and-a-half page Copenhagen Accord does not deliver what the world hoped and expected it to deliver; it is neither complex nor historic and it is not any turning point for humanity as leaders had earlier described.

BASIC countries and the Copenhagen Accord

Copenhagen has 'institutionalized' the creation of the advanced developing countries (ADC) block, which now includes China, India, South Africa and Brazil, in the decreasing order of their emissions ranking (the so-called elitist BASIC countries, the first letters of the names of these countries read backwards). The rich industrialized world (climate debtors) succeeded in projecting the ADC as the main culprits of emissions, pitting the rest of the developing world (climate victims) somewhat against them. The combined emissions of the BASIC countries in 2006 added up to 8131.7 m tonnes and they had a total population of 0.270 billion living in them with an annual mean per capita emission of 3.00 tonnes (Table 1). The

*The views expressed in this article are the author's personal views and not necessarily those of the Rubber Research Institute of India or Rubber Board.

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Table 1. Comparison of the per capita emissions and the emissions reduction performance of the various Annex I countries (according to their respective Kyoto Protocol commitments), the US, the BASIC countries and the rest of the Non-Annex I countries as of 2006

Country grouping		CO_2 emission (1990) (m tonnes)*	CO_2 emission (2006) (m tonnes)	Population (2006) (m)	QELRC (%)**	Change in emissions as of 2006 compared to 1990 (%)	Per capita emissions (2006) (t CO_2)
United States		5028.5	5902.7	302.841	–7	17.4	19.49
Annex I countries (Australia, New Zealand, Japan and W. Europe)	Total	5176.2	6034.4	616.913	–	–	–
	Mean per country	225.1	262.4	26.8223	–5.61	16.58	9.78
Annex I countries (Russia, EITs, E. Europe)***	Total	3513.0	2779.3	296.372	–	–	–
	Mean per country	270.2	213.8	22.79785	–6.23	–20.8	9.37
Non-Annex I (BASIC countries)	Brazil	237.7	377.2	189.323	–	58.7	1.99
	South Africa	301.0	443.6	48.282	–	47.34	9.18
	India	583.2	1293.2	1151.751	–	121.71	1.12
	China	2293.4	6017.7	1320.864	–	162.39	4.55
	Total	3415.4	8131.7	2710.22	–	–	3
	Mean per country	853.8	2032.9	677.555	–	138.1	3
Non-Annex I (other than BASIC countries)	Total	5003.9	6125.1	2049.3	–	22.4	2.99
World total*		21,683.2	29,195.4	6592.9	–	34.64	4.43

*Emissions data for some countries are for the year 1992 and 1993, instead of 1990. Therefore, emissions of the US, Annex I and Non-Annex I countries do not add up to the world total emissions.

**QELRCs refer to the quantified emissions limitation and reduction commitment of the Annex I country (that is the percentage of reduction in emissions) which it should achieve at the end of the first commitment period of the Kyoto Protocol (2008–2012) as compared to its emissions in 1990.

***EITs are the economies in transition (i.e. countries that are undergoing the process of transition from state-controlled to a market economy, namely, countries of the former USSR, central and eastern Europe).

Note that among the Annex I countries, only Russia and east European countries showed marked reductions in their emissions and that too well above their respective Kyoto targets, apparently due to their poor economic growth. None of the developed western nations, except Germany and the UK to a small extent, showed any reduction in emissions between 1990 and 2006.

total aggregate emissions from all the Annex I Parties, the US and the rest of the developing world (excluding the BASIC countries) during 2006 were 6034.4, 5902.7 and 6125.1 m tonnne CO_2 respectively. The aggregate population was 0.617 billion (Annex I Parties other than the US), 0.303 billion (the US) and 2.049 billion (the rest of the world excluding the BASIC countries) and their annual per capita emissions were 6.61, 19.49 and 2.99 respectively. Clearly, the BASIC countries are different from the rest of the 150 plus developing countries whose combined emissions constitute just three-fourths of the total emissions from the four BASIC countries, but their per capita emissions are comparable (Table 1).

The BASIC countries are fast developing economies, but they have more differences in their emissions than commonalities (Table 1). Brazil and South Africa together contributed only 10% of the total BASIC emissions in 2006. The two top emitters in the BASIC group are China and India, but their emission profiles are so profoundly different that China, the top emitter in the world and whose emissions constituted 74% of the total BASIC emissions stands out (Table 1).

The Copenhagen Accord is an agreement made among a select group of 26 nations (22 developed countries and the four BASIC countries) out of the total 192 nations present at the UNFCCC. Although the UNFCCC failed to adopt this agreement, countries were given time until 31 January 2010 to report their emission reduction commitments. As of now, these commitments fall far short of what is required for containing global warming to less than 2°C. With no road map to achieve equitable and quantified emissions reductions and mechanism for extending financial and technological assistance to developing countries for climate change mitigation and adaptation conspicuously absent, this accord falls short of expectations.

The Indian stand at Copenhagen: a sellout?

India played a visibly leading role in Copenhagen and it did not change its previous stand of not accepting a legally binding emissions reduction commitment. India went to Copenhagen armed with its earlier voluntary decision to cut carbon intensity (i.e. the amount of carbon dioxide released per unit GDP) by 20–25% by 2020 from the 2005 levels, independent of the outcome at Copenhagen. It even promised to do more if there is international

Table 2. Comparison of the trends in fossil fuel emissions, gross domestic product and carbon intensity of economy of India and China with the world (2000–06)

	India	China	World
Total annual fossil fuel consumption (quadrillion Btu) (2006)	16.3	68.9	407.3
Rate of growth in annual fossil fuel consumption (quadrillion Btu/yr) (2000–06)	0.61	6.08	12.31
Total annual fossil fuel emissions (mt CO_2) (2006)	1293	6018	29195
Per capita CO_2 emission (t CO_2/head/yr) (2006)	1.20	4.60	4.38
Rate of growth in annual fossil fuel emissions (mt CO_2/yr) (2000–06)	45.6	543.0	951.8
GDP (b US$) (2006)	877	2645	48505
Rate of annual growth in GDP (b US$/yr) (2000–06)	72.9	237.6	3047.5
Carbon intensity of economy (mt CO_2/b US$ GDP) (2000)	1.474	2.275	0.602
Rate of growth in carbon intensity of economy (mt CO_2/b US$ GDP/yr) (2000–06)	–0.1375	–0.011	–0.029

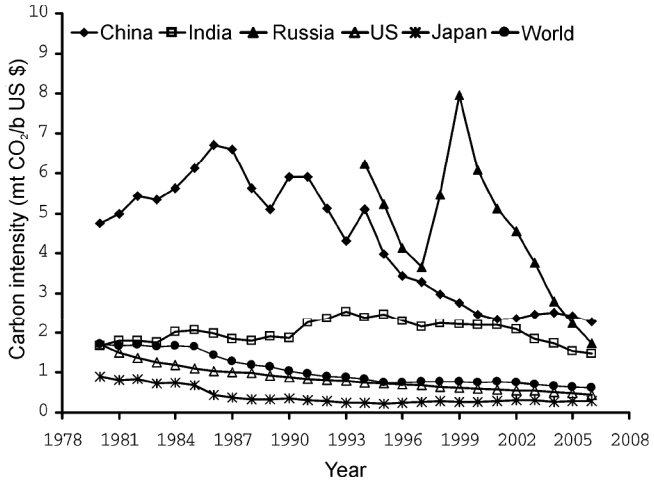

Figure 1. Carbon intensities of the world and some major economies (1980–2006).

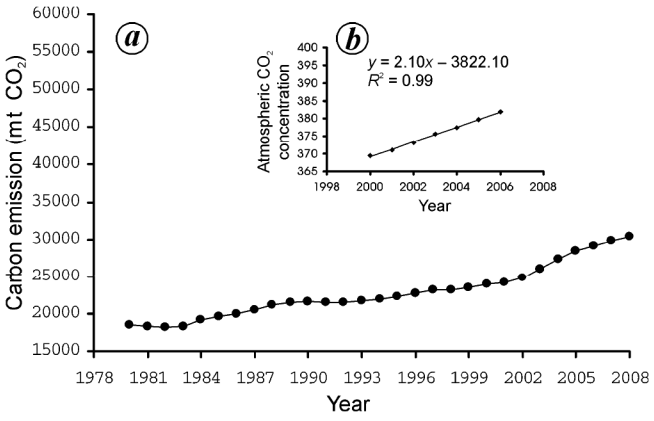

Figure 2. *a*, Rise in global CO_2 emissions between 1980 and 2006. *b*, In the inset, buildup of atmospheric CO_2 concentration between 2000 and 2006 is given.

support (in terms of technology and funding) for reducing its emissions, but did not agree to any emissions peaking year or international verification or monitoring of its domestic emissions reduction actions, except those projects that have international assistance.

As against the 20–25% reduction in carbon intensity that India is aiming for, China has set a target of 40–45% reduction in its carbon intensity by 2020 as compared to 2005. One should not get carried away by these remarkably large Chinese numbers. Given that the Chinese carbon intensity has been consistently much higher than that of India (Figure 1), the Chinese offer is not more substantial than the Indian target and it will not bring the Chinese carbon intensity below that of India. Improving carbon intensity is good for China, but the global emissions will continue to suffer from the large Chinese emissions if they do not contain the very high rate at which their fossil energy consumption has been increasing in the recent years (Table 2). China is culpably silent on this whereas India does not share the same guilt as the environmental cost of its economic growth is much smaller than that of China, both at the aggregate and per capita levels (Table 2).

Total emissions continued to increase even as the carbon intensity reduced (Figure 2 *a*, Tables 1 and 2). Some parliamentarians and political parties in India alleged that India's voluntary decision to reduce the carbon intensity was made under international pressure and that it amounted to a 'sellout' to the US. Reducing carbon intensity means improving energy use efficiency, i.e. using Indian fossil fuel resources for more economic growth which is perfectly in India's own interest. Where is the sellout here? International pressure is still on India to make legally binding emissions reductions, but not agreeing for an emissions peaking year, India is keeping its options open to increase its emissions in future; India has not buckled under pressure.

Some 'inconvenient truths' about the Chinese economy and emissions

It is not just the aggregate national emissions and the per capita emissions that are significantly large in China compared to India, the former also shows no let up in the rate at which its emissions have been increasing in the recent years (Table 2). For example, during 2000–2006, the aggregate emissions in China increased at the rate of

543.0 mt CO_2 per year which constituted 57% of the rate at which the total world emissions increased (951.8 mt CO_2 per year) during the same period, suggesting that the lion's share of contribution to the current rate of buildup of CO_2 in the atmosphere (which is about 2.1 ppm per year, Figure 2 *b*) came from one single country alone, namely China. The aggregate Indian emissions increased by only 45.6 mt CO_2 per year during this period. China consumed as much as 68.9 quadrillion British thermal unit (Btu) equivalent of fossil fuels in 2006, but the Indian consumption of fossil fuels was only 16.3 quadrillion Btu the same year. Fossil fuel consumption rose at a stunning rate of 6.08 quadrillion Btu per year in China, but in India this rose only at a small rate of 0.61 quadrillion Btu per year between 2000 and 2006; a ten times slower growth than China (Table 2).

Going by the present trend (Table 2), the aggregate Indian emissions will remain a distant fourth, almost 4.7 times below that of China and the rate of annual growth in emissions in India is highly unlikely to catch up with that of China in the near future (Table 2). Even if India could double its per capita emissions from 1.2 t CO_2 per head per year (as of 2006) to 2.4 t CO_2 per head per year, the mean per capita emissions in India will still be way below that of the 2006 averages for the world (4.38 t CO_2 per head per year), China (4.6 t CO_2 per head per year) and the Organisation for Economic Co-operation and Development (OECD) countries (10.46 t CO_2 per head per year). The environmental burden of the Indian economic growth on the rest of the world will therefore remain far below that of the world average, and below that of the Chinese and the developed counties for the next several years.

The carbon intensity of the economy, which is a gross measure of the climate burden of economic development was as low as 1.474 mt CO_2 per billion US$ GDP in India and as high as 2.275 mt CO_2 per billion US$ GDP in China during 2006 (Figure 1). The Indian economy has been consistently de-carbonizing at an impressive rate of 0.1375 mt CO_2 per billion US$ GDP per year, whereas this rate was only 0.011 mt CO_2 per billion US$ GDP in China during 2000–2006 (Table 2). Like most developed countries, even as the carbon intensity decreased, the total emissions continued to increase in India and China (Table 1) due to fast economic growth. The Chinese economy has been historically a more carbon intensive one than India (Figure 1). With the world's largest aggregate emissions occurring in China, and its GDP and emissions growth the fastest in the world, the climate burden of Chinese economic growth on the rest of the world is also the highest.

Treat India differently from China

The highly skewed Chinese growth in fossil fuel consumption and emissions (Table 2) upsets the global carbon equations and carbon equity among the other developing countries, especially with India, which is very often wrongly treated on par with China. Any small shift in the carbon intensity of the Chinese economy and not that of the Indian economy, either up or down, is bound to reflect substantially at the global level.

Even if the annual rate of increase in Indian emissions were to reduce by 50% today (which, in the present scenario is unrealistic, unacceptable and unachievable without seriously compromising economic growth), there will be a saving of emissions to the tune of 22.8 mt CO_2 per year (Table 2). But a mere 10% reduction in the annual rate of emissions growth in China – which is not entirely intangible – will save up to 54.3 mt CO_2 emission a year. Thus there will be far greater impact if a small per cent of the Chinese emissions is capped than if a similar per cent of the Indian emissions is capped. The climate interlocutors *en route* Cancún, Mexico 2010 (CoP 16) should not conveniently ignore these 'inconvenient truths' about the Chinese emissions and they should stop equating India with China, when it comes to likely emissions capping, sooner or later.

There is immense scope to reduce Chinese emissions without affecting their economic growth, provided the carbon intensity of the Chinese economy can be lowered by improving energy use efficiency or switching over to less emitting forms of energy. At the current level of fossil fuel consumption and GDP, a mere 10% improvement in the carbon intensity of the Chinese economy by improving energy use efficiency or using less emitting forms of energy has the capacity to cut down as much as 601 mt CO_2 emission every year, which is as good as reducing Indian emissions almost by half! If the carbon intensity of the economy of China could be brought down to that of India, this will result in an astounding emissions saving of more than 2000 mt CO_2 a year. Note that the aggregate Indian emissions is only 1293 mt CO_2 a year.

A parallel is often drawn between the Indian and Chinese achievements in science and technology. There is no reason why a 'confident China' – with a strong political will for adopting appropriate low carbon technologies – cannot achieve as low a carbon intensity as that of the Indian economy, if not better. Such an achievement is not only realistic, acceptable and achievable for a technologically fast advancing China, but it is also their responsibility, because the environmental burden of Chinese economic growth on the rest of the world is the highest. Although India is keen to use more nuclear energy which is expensive, China seems to still opt for using as much coal as possible which is the cheapest, but most emitting form of fossil fuels. Recent reports indicate that China has signed a deal with Australia for import of coal worth US$ 60 billion.

Given the huge rate of increase in fossil fuel consumption in China, indication is that China will continue to be

the one single country contributing the largest to global emissions in the coming years. If Annex I Parties were collectively responsible for the historic emissions, then the present day Chinese emissions will be responsible for most of the future climate change. China argued in Copenhagen that financial support from the developed nations (historic climate debtors) to the developing countries (today's climate victims) 'is not an act of charity or philanthropy of rich people. . . . It is the legal and historical responsibility of the developed countries'. When the US delegation to Copenhagen admitted their historic role in the past emissions about which they were not apologetic and that China should not expect any climate money from the US, the Chinese retorted saying that Todd Stern, the head of the US delegation was either ignorant, irresponsible or he lacked common sense. Is what China doing today any different from what the US and other rich countries did in the past (and still doing) when the world was far less concerned about emissions?

In conclusion, any emissions reduction by India can only make a small impact globally, but a small percentage of reduction in Chinese emissions will have a substantial impact on global emissions. Exerting pressure on India to limit its emissions could be seen only as a covert political strategy to constrain its economic growth, which consistently has been a low carbon intensive economy compared to China. Neither the developed world, nor China, nor the rest of the BASIC countries should therefore expect India to go along with China at the climate change negotiations in Mexico later this year.

Note: CO_2 emissions in this article refer to that from fossil fuels only and not CO_2 equivalents, and the source of the emissions data is: Energy Information Administration (http://www.eia.doe.gov). Atmospheric CO_2 concentration data is from the website of Carbon Dioxide Information Analysis Center of US Department of Energy (http://cdiac.esd.ornl.gov). GDP data from IMF, World Economic Outlook Database, April 2008. Population data from EarthTrends (http://earthtrends.wri.org) searchable database results provided by the World Resources Institute (http://www.wri.org).

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MEETINGS/SYMPOSIA/SEMINARS

International Symposium on Brain Aging and Dementia: Basic and Translational Aspects

Date: 29–30 November 2010
Place: Banaras Hindu University, Varanasi

Themes include: Brain aging, Neuronal plasticity, Synaptic transmission, Learning and memory, Cognitive impairment, Dementia and care, Neurodegenerative diseases, Therapeutic interventions.

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5th Congress of Federation of Asian and Oceanian Neuroscience Societies (FAONS) and XXVIII Annual Meeting of the Indian Academy of Neurosciences (IAN)

Date: 25–28 November 2010
Place: Lucknow

Themes include: Brain development, Plasticity and aging, Clinical neurosciences, Computational neurosciences, Functional and molecular neuroimaging, Molecular signalling and synaptic transmission, Neurotoxicity mechanisms and contributing factors, Neuroactive substances, Neurodegeneration and neuroprotection, Behaviour and mental illness, Neurogenomics and proteomics, Systems biology and integrative neuroscience, Neuroinformatics, Neuroimmunology and neurovirology.

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