RETHINKING INDIA'S CLIMATE POLICY AND THE GLOBAL NEGOTIATIONS

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SUMMARY

This essay examines India's position in international negotiations on climate change and domestic mitigation actions, based on scientific evidence and equity. It is argued that India's stance has largely been reactive to positions taken by developed countries, particularly the US. Scientific predictions of the imminent climate crisis have been inadequately factored into policies. India, along with its South Asian neighbours, is among those regions considered to be the worst affected by climate related impacts. This should have – but has not – driven India to champion the urgent achievement of an equitable global emissions control agreement, as LDCs and Small Islands States have done. India has made quite serious mitigation commitments in international fora, but their translation into policies has been met with mixed success, and the evolution of a holistic, domestically equitable low-carbon development pathway appears a distant dream.

The paper argues that India would do well to adopt a pro-active stance towards international climate negotiations. As a responsible member of the global community, India could offer to be part of an equitable solution based on common but differentiated responsibilities. This position would acknowledge the need for emissions from large developing country to "deviate below the current trend line", as the 4th report of the Intergovernmental Panel on Climate Change (IPCC) puts it, while respecting the sentiments of India's natural allies – the G77, Least Developed Countries, the Africa Group and Island States. We examine two propositions that meet the joint requirements of science and equity, and follow the "single framework" approach dear to the US, while allowing developing countries flexibility to reach peak emissions in the foreseeable future:

- The "carbon budgets" approach calculates the amount of carbon that can realistically be held by the atmosphere if the temperature rise is to be limited to two degrees. It then defines and allocates each nation's per capita entitlement to a "fair share" of the global atmospheric commons.
- A co-benefit approach considers multiple developmental objectives including greenhouse gas (GHG) mitigation.

The paper concludes with a call for a campaign bringing together civil society groups and activists from the South and from the North. Governments and civil society stakeholders need to better understand lessons of climate science, development priorities of the global South, and the imperatives of global as well as national equity. This gap should be bridged if nations of the world are to be pushed towards an effective, equitable climate agreement.

INTRODUCTION

The world is at an inflection point in the climate crisis.[2] Unless determined and concerted action to reduce greenhouse gas (GHG) emissions is taken globally—and immediately—global warming could spiral to irreversible levels. Scientific evidence gets more definitive by the day that runaway climate change could set in, if global emissions of GHGs are not capped, and then reduced sharply to ensure atmospheric GHG concentrations stay below identified stabilisation levels. Save a few "climate sceptics," (in many ways the modern day equivalent of flat-earthers), everyone knows this—scientists, technologists, political leaders, planners, administrators, think tanks and civil society activists. And yet the global climate negotiations that were slated to arrive at a new international emissions control arrangement in Copenhagen in December 2009, failed to finalise a new binding global compact. Even at the Conference of Parties (COP) in Durban at the end of2011, the can was effectively kicked down the road. Countries agreed just to draw up a new agreement by 2015 that would come into effect in 2020 through a new Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP).

The Durban COP also could not agree on the terms for a second commitment period of the Kyoto Protocol (KP), which sets binding emissions reduction targets for developed countries, from 2012 until a new agreement takes effect. It was only in the follow-up meeting in Doha that a total vacuum in the international emissions control regime was avoided by an agreement on a second commitment period extending KP to 2020, even though several large emitters such as Japan, Russia and New Zealand dropped out and the emissions reduction target was severely attenuated to 20 per cent below 1990 levels compared to around 40 per cent recommended by the Intergovernmental Panel on Climate Change (IPCC). As things stand, KP-II now covers less than 14 per cent of current global emissions.[3]

As will be discussed in more detail later, ADP fundamentally calls into question some of the basic principles of the Kyoto Protocol and the architecture of the prevalent global emissions control regime. It has reopened almost all the issues that were debated in the run-up to the Kyoto agreement, implying an almost *de novo* discussion on all aspects. To no one's surprise, the ADP process has made little substantive headway since the Durban summit. The Doha conference in 2012, for instance ended with no progress being made towards forging a new global arrangement. The industrialised countries in particular refused to raise their low emissions reduction commitments and the US continued to signal its ambivalence about any future global treaty.

This depressing scenario has come about not because feasible solutions are not available, but because developed nations want to preserve their dominance and political-economic advantage within the global capitalist system. They want to pressure developing countries, especially the big ones such as China, India, Brazil and others, into accepting a greater share of the burden of emissions reduction, thereby squeezing their economies.

The larger developing countries in turn are zealously advancing perceived national interests, including through opportunistic, tactical alliances with developed nations and jockeying for better positions in the international pecking order, while several other nations appear to be playing both ends against the middle. These actors advance their many arguments, some with more justification than others, but often hide their own limited short-term interests behind lofty ideals.

In this context, this essay examines the role that India can play in these negotiations and in shaping the outcome of a resultant emissions control regime. The paper argues that reconfiguring its climate policy both internationally and domestically can help the country be a more effective player and make a more meaningful contribution to tackling the climate crisis. The analysis is not conducted simply on a tactical plane. In other words, it does not only focus on what India could have said or done differently vis-à-vis other actors, but also looks at the issue strategically to better understand where the world stands with respect to climate change and what needs to be done to address this problem in terms of conceptualising a new equitable international arrangement.

The essay does not propose to examine the entire gamut of issues involved in the global negotiations or the climate crisis in general.

But to frame the discussion, Sections 1 and 2 advance an assessment of the science, what we know about the current status and the prognosis on GHG emissions and climate change, and delineate where the world stands with respect to emissions by different nations, where the global negotiations have brought us, and what needs to be done to meet the goals set by science and in the negotiations.

Against this background, Section 3 takes a closer look at India's position in the global negotiations. India, one of the pioneers that helped define the principles and cornerstones of the global emissions control architecture under the UN Framework Convention on Climate Change (UNFCCC), found itself isolated at Durban. This was dramatically captured in the iconic photograph of the final day showing India's Environment Minister Jayanthi Natarajan and her aides surrounded by ministers and envoys of other major players both developed and developing, all persuading her to sign on to the ADP which India alone had been holding out on until then.

This section also examines how India managed to get into this position of being under pressure from both developed and developing countries to do more to help reduce global emissions, and of championing the cause of equity, but in a manner that appears not to be succeeding in bringing other nations on board. It will be argued that India's climate policy has been largely externally driven—by shifting foreign policy considerations and in defence of national interest vis-à-vis other powers within global treaty negotiations, and that India's negotiating position has been significantly influenced, to its detriment, by a shift in foreign policy orientation leaning more towards the US and its developed country allies.

Section 4 argues that India's position in global negotiations would have looked very different if more attention were paid to the science, especially the rapidly approaching tipping point when climate change could become catastrophic, and the impact this would have on India's vital interests. In this context, the need for India (and other large developing nations) to take on mitigation actions commensurate with what science and various modelling exercises indicate regarding emissions by large developing countries, would also be discussed. It is suggested that India could offer, in furtherance of its own vital interests, significant contributions to the global emissions reduction effort led by and linked to deeper cuts by developed nations. Such an offer made by India, declaring that it wants to be part of the solution even though it has not been part of the problem, could still project India's position very differently than it has hitherto, with potential to shift the dynamics of the negotiations. India's position would then also be far better aligned with those of the poor and vulnerable island states and least developed countries (LDCs).

Section 5 discusses these climate impacts in India more specifically, showing that India is indeed among the worst-affected countries in the world along with our South Asian neighbours. The importance of bringing about a global agreement to limit emissions causing such massive impacts, further adding to the burden of poverty and underdevelopment being carried by India, is emphasized. Foregrounding climate impacts in India would also facilitate planning and implementation of programmes aimed at minimizing these impacts and reducing vulnerabilities, especially among the already deprived sections. It is further contended that such an essentially domestically-driven climate policy enables a common perspective within the nation and abroad, thus better harmonizing domestic actions with external commitments, rather than making the former an adjunct to the latter as they mostly are at present.

The last section offers some suggestions for the future, first for an equitable and effective global emissions control regime, which India could officially champion if it so desires, and second for a domestic climate policy addressing both climate impacts and mitigation obligations arising from any global compact arrived at.

A promising framework for a global emissions compact is offered, namely a carbon budgets approach, wherein the remaining carbon that the atmosphere can hold at a maximum, is apportioned to each country according to its "fair share", in proportion to its population after allowing for historical emissions. This scheme, it is argued, enables resolution of the multiple demands of science, equity in burden-sharing among nations, adherence to the principle of common but differentiated responsibility and respective capability (CBDR-RC), and some other contentious issues. The prospect of adopting such an approach is also briefly touched upon.

A co-benefits approach to domestic climate policy formulation, wherein a conscious effort is made to optimise mitigation and adaptation actions as well as other developmental goals, especially equity, is also proffered. A climate policy framed in this manner, it is suggested, would enable India to more powerfully advocate inter-nation equity by harmonising its position on the international stage with its domestic actions. A stronger pursuit of equity and low-carbon developmental goals at home will also help build a firm and lasting social and political support base for a progressive climate policy in India.

1. CLIMATE CRISIS AND SCIENCE: STATUS AND PROGNOSIS

A major weakness of a substantial section of official policy formulation as well as civil society-NGO critiques and campaigns on climate, certainly in India, has been debility with regard to the essentials of the science and using this understanding to anchor positions and recommendations. Climate science is undeniably complex, with many uncertainties, nuances and qualifying conditions. A detailed, insider knowledge and expertise is not, however, essential to get at the fundamentals required to understand the problem and the implications of different global and national emission targets. It must be admitted though, that scientists and well-informed campaigners have not done a good enough job of communicating these essentials. An attempt is made here.

The Durban outcome, with add-ons at Doha, building on the earlier agreements at Copenhagen and Cancun, has clearly left the world not much better off than before---perhaps even worse off if one considers that every year decisive emissions reduction actions are postponed, climate change and its impacts will become more intense, essentially translating into even tougher actions that will be required later.

This, despite the broad scientific consensus represented in the IPCC Fourth Assessment Report (IPCC/AR4) that atmospheric GHG concentrations are close to a "tipping point" beyond which lies possible irreversible climate change, and that urgent mitigation actions are required. These include—bracketing for the moment various qualifying and probability statements reflective of abundant caution of the scientific community—global emissions reaching a maximum and then starting to decline by 2015; global emissions reducing by 50 per cent by 2050, of which developed country emissions to cut 40 per cent compared to 1990 levels by 2020 and 90-95 per cent by 2050.[4] Many authoritative studies estimate that the voluntary pledges made in Cancun by 85 nations, following the pattern set in the Copenhagen Accord and which are presumed to prevail till the new dispensation comes into play, will see global average temperatures rise by 3-3.5°C.[5] All preliminary indications suggest that IPCC's Fifth Assessment Report due next year will not only confirm this but may even make a worse prognosis.

This is far above the oft-repeated goal, reiterated in Durban, of limiting global average temperature rise to 2°C. It is worth recalling that this egregious target was first enunciated at the G8 Summits and regrettably supported by leading developing countries including India, China, Brazil and South Africa in the so-called "Major Economies Forum" which later morphed into the G20.[6] The problem of course is that all the parties know fully well that, with the pledges currently on the table, this goal cannot be achieved.

Indeed, the goal should never have been set in terms of temperature rise in the first place since this is an outcome that cannot be directly monitored or regulated in real time. One cannot also simply "read off" temperature rise from emissions or GHG concentrations, or translate one into the other. Numerous other complexities also arise such as the probability of temperature rising by a certain quantity[7] and so on. Instead, global emissions control goals should be set in terms of the emissions that cause the problem, whether the emissions are measured annually or with any other periodicity or cumulatively, or in terms of the resultant concentrations of atmospheric GHGs that can be measured and regulated more or less concurrently.[8]

In any case, the fact that the 2°C target is already beyond reach has serious consequences, especially for India and South Asia in general, which are projected to be among the regions worst-affected by climate change (IPCC 2007b). Regrettably, while being noted *pro forma* in official policy statements by India, this salient fact has not been factored in as a grave, perhaps even existential, threat to the nation which makes it imperative for a global emissions control agreement to be arrived at urgently under the UNFCCC. The small island nations may be confronting a more imminent threat to their existence,[9] but the threat posed to hundreds of millions of people in India, as will be discussed further below, is surely grave enough to warrant equally serious concern.

With the legally-binding Kyoto Protocol having been extended till 2020 albeit with low targets, weaker rules and covering fewer countries than earlier, and with a new arrangement not slated to come into effect till then, the non-binding

Cancun Agreement remains the main hope for any check on galloping global emissions. The agreement in Cancun in December 2010, it will be recalled, is a set of voluntary emissions reduction pledges by 85 countries which, forming part of the COP proceedings in an Annexure, formalised the infamous Copenhagen Accord with its similar US-led pledge-and-review system that was "parachuted" into the Copenhagen conference and failed to secure endorsement of the COP.

Two aspects of this are noteworthy for the prognosis under discussion, and should be kept in mind for subsequent sections.

First, the bottom-up pledge-and-review system, howsoever reasonable it appears as a pragmatic alternative to a target-based system that seemed beyond practicable agreement, is by its very character flawed and incapable of delivering the desired goal of restricting temperature rise to 2°C. The upper bound target is not some arbitrary number set by idealistic negotiators, but is a limit set by nature, representing the maximum amount of carbon the atmosphere can hold, over and above what it already contains in order that the resultant greenhouse effect does not lead to a rise in temperature beyond 2°C. It stands to reason that any method of apportioning which nation needs to do how much in terms of emissions reduction must achieve that cumulative effect. In other words, it should either be ensured, through some iterative process, that the various pledges add up to the total required for meeting the 2°C goal, or this goal should be used as a starting point from which the quota for each nation is somehow derived. Pledge-and-review without reference to the upper bound goal is doomed to failure. If one may use a cricket analogy, it is like a team chasing a set target of runs but pledging only to score a certain number of runs per over without reference to the target! Clearly, the target to be reached must be the starting point for determining how it is to be achieved.

Second, with the pledges made in Cancun and the obligations under the extended Kyoto Protocol, even the dubious 2°C goal has been left far behind. The stipulation in the Durban Platform that countries would attempt to increase their pledged emission cuts before 2020 may be taken with the proverbial pinch of salt. This leaves a huge gap between the emissions actually reduced or likely to be reduced over the next few years, and the reductions required to limit emissions-induced temperature rise to 2°C.[10]

Against such a background, the Durban Platform's promise to review the goal and examine the possibility of "raising the ambition" to restricting temperature rise to an even lower 1.5°C global temperature rise[11], strains credulity and leaves one wondering whether there is actually any intention of ever striving towards it. Scientific consensus indicates that even the 2°C threshold, not to speak of 1.5°, has already been crossed and that only quite improbable scenarios would see a temperature rise lower than that.[12]

An authoritative report released on the eve of the Durban Summit placed the "emissions gap" for achieving the 2°C goal between 6 and 9 Gt (1 Giga tonne = 1 billion tonnes) of carbon dioxide. In other words, all the emissions cut pledges put together would fall short of achieving the goal by this margin.[13] It is still possible to close this gap, provided developed countries take on the deep emission cuts called for by the IPCC, along with large developing countries also taking on a commensurate share of the mitigation burden. But this is precisely where the problem lies: in the refusal by the global North to step up emission cuts and their attempt to shift the burden on to the developing countries. The latter have already committed themselves to substantial voluntary emissions reduction but, in the absence of serious efforts by developed nations, are resisting any higher or binding commitments. A confidential UN assessment on the eve of the Copenhagen summit showed that the voluntary commitments made thus far by developing countries such as China, India, Mexico, Brazil, South Africa, Indonesia and others, have totalled about 5.2 billion tonnes of reduced emissions, far more than the cuts pledged by developed nations amounting to only 2.1-3.4 billion tonnes.[14] Even so, the thrust of the developed countries' position now, apparently backed by many island states and LDCs, is that developing countries need to do more.

In any case, the imminent climate catastrophe is crying out for a solution, and the problem has gone way beyond the old blame game. But discussions after Durban do not seem to have made significant headway in working towards a just, equitable and science-based goal-oriented formula for burden sharing that is founded on an agreed rationale rather than on some arbitrary

assignment of numbers to this or that country or grouping. As stated in the introduction, we shall later in the article explore just such a scheme that meets all these requirements.

To round off this section on the science, one other important point that keeps emerging and which has caused considerable confusion in the discussion, needs to be clarified.

IPCC/AR4 stressed that if the required goal of keeping atmospheric GHG concentrations under the stabilisation level of 450ppm (parts per million) is to be met, failing which keeping temperature rise under 2°C would no longer be tenable, global emissions should peak by 2015 and then start declining.[15] This "peaking year" problem has repeatedly reared its head and has become one of the major contentious issues in the negotiations, being used especially by the developed countries to score points and as a lever to put pressure and extract concessions.

In Copenhagen, much fuss was made by German Chancellor Angela Merkel and other European nations about China having rejected a "peaking year" formulation in the draft text.[16] As stated earlier, the science is clear that global emissions should peak and start declining before 2015, but the problem is if developed countries say they are only going to cut emissions by a limited amount, for example the 80 per cent offered on behalf of the EU by Chancellor Merkel in Copenhagen, the implication is that developing countries should take on whatever emission reductions remains to be achieved, effectively further increasing their burden. China, and other large developing countries including India, saw this as a poorly disguised attempt by the global North to thrust a disproportionate emissions reduction burden on large developing nations. If China, India and others had accepted a global 2015 cut-off before working out other details such as exactly how much emissions would be cut by the global North, the latter could well have laid down a maximum they were willing to cut and then left the remainder for the developing countries to shoulder. The argument by China and India therefore was, and remains so today, that a global peaking year should be discussed only as part of an overall equitable and just burden-sharing agreement.[17]

2. GLOBAL NEGOTIATIONS

Neither the urgency so clearly evidenced by science, nor what science itself tells us in fairly unequivocal terms is required to be done, has been visible in the international negotiations under the UNFCCC. The process has undoubtedly seen some high points, such as the adoption of the Kyoto Protocol itself which, warts and all, remains the only global emissions control regime enacted, and that too in the face of outright opposition and cynical manipulation by the US, the world's largest emitter at the time.

But it has also seen many lows, such as the shameful Copenhagen Accord worked out through backroom deals and parachuted into the summit, or the many compromises earlier in the Kyoto Protocol such as schemes for offsetting under-achieved national emission targets mostly in developed countries against supposedly equivalent emission avoidance actions in other mostly developing nations; granting special interest favours to Canada and Australia for coal, or to the successor states of the Soviet Union for "hot air," that is, discounting the emissions that would have taken place had it not been for the economic slowdown following the collapse of the Soviet bloc; or the inter-nation carbon trading mechanism and the Clean Development Mechanism (CDM) that was supposed to assist developing countries adopt low-emission technologies provided by developed countries, such avoidance being offset against donor nation targets, both of which led to considerable trade but resulted in very little emissions reduction or technology transfer from North to South.[18] According to some estimates, the effect of all these provisions was to reduce the Kyoto Protocol emission targets from their intended 5.6 per cent below 1990 levels to around 2 per cent, but even this was not achieved, partly due to the biggest loophole of all—the absence of any compliance mechanism or penalties for under-performance. Nor have any significant financial flows occurred from the global North to the South, neither as compensation for the environmental damage caused to the atmospheric commons nor to assist developing countries cope with the impacts of climate change and adopt mitigation measures.

At the time, these provisions were worked into the Kyoto Protocol in the face of widespread criticism. The dilutions were grudgingly accepted as necessary evils in the service of the larger good and compromises made to secure a global deal. However, in structural terms, most of these have come back to bedevil the negotiations, not necessarily in detail, but in their basic structure and intent namely, to dilute treaty obligations, render them toothless and perpetuate the dominance of the global North, especially through commodification of the atmospheric commons and institutionalisation of market mechanisms such as the so-called CDM to regulate emissions, even though it was precisely the untrammelled operation of the market that led to the crisis in the first place. A classic case of the fox guarding the hen house!

For this essay, there is little purpose in discussing these different Kyoto provisions or narrating the gory details of the negotiations leading to the Kyoto Protocol agreement.[19] The salient point here is that, far from tightening these above loopholes, the negotiations from Copenhagen to Durban have actually proceeded in a retrograde direction. And this despite mounting evidence of the impending crisis and the growing certainty that delayed action on emissions reduction now will only deepen the crisis and require even more severe emission cuts later on.

As averred earlier, COP17 at Durban did not finalise the terms of a new international emissions control regime nor did it agree on enhanced emission cuts in a second commitment period of the Kyoto Protocol, although the follow-up Doha Conference did formally extend the KP till 2020 albeit with watered down terms and with fewer nations covered under it. Whereas the Durban Platform contains an agreement to evolve a new global treaty by 2015 so as to come into effect by 2020, a closer reading shows that ADP has in fact thrown open for debate once again all the earlier agreed elements of a global emissions control architecture, leading this writer to characterise the now ongoing process as "Kyoto redux."[20]

There are of course many interpretations of the ADP under which the new agreement is to be drawn up. However, there is broad concurrence that ADP is neither completely open-ended nor fully pre-defined,[21] meaning there is still some wiggle room for all parties. But the broad contours of a new architecture and the

lines along which future negotiations would be conducted appear to have been broadly delineated. The extremely brief Durban Platform text calls for a new "protocol, another legal instrument or an agreed outcome with legal force"— the last phrase being inserted at India's insistence, thus breaking the deadlock—along with "options for a range of actions" rather than commitments as under Kyoto, which should be "applicable to all parties" rather than based on the Kyoto principle of common but differentiated responsibilities, but at the same time accepting that the new arrangement would be "under the [UN Framework] Convention" whatever that may imply[22].

This makes it clear that the Durban Platform not only throws open to debate all issues, including those earlier settled under the Kyoto Protocol, but also appears to tilt the balance in favour of the developed countries by not insisting on stiff emissions reduction commitments by them while setting some limits to the negotiating space available to the developing countries. So where does this leave the negotiations process, and what can one say about the prospects for meaningfully shaping the architecture of a new equitable and just global system for regulating GHG emissions?

It must be recognised categorically that the ground shifted decisively at and since Copenhagen. It may initially have been thought that the Copenhagen Accord, not having been endorsed but only "noted" by the COP, had meant that the older formulations in play in the negotiations process still had a chance to prevail, but the summit declaration at Cancun followed by the Durban Platform should put paid to these fond hopes. The path from Copenhagen to Durban via Cancun has been a continuum, a steady progression and consolidation of certain ideas[23], and not, as some commentators have it, a story of initial failure at Copenhagen followed by improvements at later summits. These three summits, with Durban as the culmination, mark a watershed in what history will recognise as the post-Kyoto phase of the international emissions control architecture.

Some salient features of the new post-Copenhagen formulations that presage the new emissions control regime should be noted here, although limitations of space do not permit a detailed examination.

The "single framework" the US had been pushing for long is poised to become a reality, as opposed to the dualistic framework of the Kyoto Protocol with its firewall between the developed and developing countries, prescribing binding targets for the former and expecting only voluntary mitigation actions by the latter. This historical interpretation of the UNFCCC's principle of "common but differentiated responsibility", believed to thus enshrine the principle of equity between nations, is now rejected not only by the US, EU and their allies, but also deeply questioned by many other nations including many developing countries especially the island states. This momentous shift is reflected in the phraseology of the Durban Platform, itself building on formulations at the climate summits at Cancun and Copenhagen and, as we will see, by other important and even earlier international summits.

Notably, the ADP text does not mention either "equity" or CBDR. Indeed the US, which played a major role in keeping CBDR out of the Durban text, has been claiming that it agreed to the Durban Platform precisely because it has delivered the "symmetry" between developed and developing countries that the US has long pushed for. Todd Stern, the US Special Envoy for Climate Change and leader of the US delegation at Durban, has explicitly stated that "for the first time, we agreed that by 2020, all countries will be covered under the same legal regime..." (and that the Durban Platform being "applicable to all parties" therefore) "sets us on a path towards a very different kind of global agreement."[24] The justification that equity and CBDR are implicitly recognized by the reference in the ADP text to the new instrument being constructed "under the (UN Framework) Convention (on Climate Change)" or UNFCCC is dubious and papers over the tell-tale omission of both equity and CBDR precisely because the US, EU and some others have come to the definite conclusion that these terms have historically carried certain implications which should now be decisively discarded.

This is not of course anything new that came about suddenly at Durban. The idea in the Copenhagen Accord of an emissions control architecture comprising not top-down targets but bottom-up pledges being made by both developed and developing countries, an idea that was subsequently endorsed by the COP

the following year at Cancun, itself represented a single framework. The agreement at Cancun endorsed by the COP in fact legitimised an enlarged list of voluntary pledges, the scheme rejected by the COP at Copenhagen a year ago. In the words of Todd Stern again, "all major players pledged to take actions to reduce their emissions."[25]

If the "single framework" foundation stone of a future emissions control architecture had been laid at Copenhagen and cemented at Cancun and Durban, the ground-breaking had been done much earlier under US leadership at various G8+ Summits. It was in this theatre, which later morphed into the "Major Economies Forum" and the G20, that the idea of "major emitters" together making mitigation commitments had first become institutionalised, with China, India, Brazil, South Africa and other large developing countries willingly signing on to many formulations that were subsequently to reappear later in the COPs.[26] Whatever the motivations of individual developing countries for this collusion with the US and its allies, the former cannot now feign ignorance or surprise at the formulations at Durban and the developments leading up to it from Copenhagen.

The fact that most of the debate since Durban has centred around the issue of equity, and how exactly this concept should be reflected in any final emissions control regime, conveys that a broad agreement prevails among major players on other elements of a future climate agreement as contained in ADP. The idea of emissions trading in one form or another implies a continued reliance on market mechanisms and a major dilution of the Kyoto requirement of fund flows from North to South including the explicit provision that this would include loans and private sector funds. It is also a reiteration of the dominant role of intellectual property rights in technology transfers from developed to developing countries. These indicate that developed countries have succeeded in imposing their agenda within the framework of the extant global capitalist system.

What ADP does not contain is any commitment by the industrialised North on the deep emission cuts required of them. In fact, ADP even contains a proviso reversing the Kyoto stipulation that under-performance by any nation on its prescribed emission cuts would have to be made up in the subsequent commitment period. It now permits nations such as Germany and the UK, that have reduced emissions more than their target, to deduct this difference in their next tranche![27] So much for raising amibitions to control climate change! ADP also does not state that any future emissions control regime would be based on national targets, leaving open the possibility of a bottom-up pledge-and-review architecture, and undermining the very goal-oriented structure required.

With all the basic issues debated towards Kyoto now once again up for grabs, just how the burden of reducing future emissions would be shared is also not yet cast in stone, leaving the door open to new ideas. While the US may like to think, or portray the ADP as having decided, that its idea of "symmetry" between developed and developing countries means that both sets of countries would have the same kind of targets, the still relevant concept of "differentiated responsibility" leaves ample room for other interpretations.

Finally, a great deal of attention in the immediate aftermath of the Durban summit focused on the eleventh hour drama, with India holding out against a new legally binding instrument and finally acquiescing after its concerns on equity had supposedly been accommodated. This narrative is unconvincing. It ignores the fact, as discussed above, that equity and CBDR have now been given new meanings quite different from those in the Kyoto Protocol. More importantly, did India really achieve anything significant by obtaining the insertion into the Durban text of the famous "third option," namely to evolve "a protocol, another legal instrument or *an agreed outcome with legal force* (emphasis added)"?[28] Legal experts concur that this phrasing makes little difference.[29] And surely, India does not want that. Should developed countries also be allowed to get away from legally binding targets?

The iconic image from the last day at the Durban Conference, of India's Environment Minister Jayanthi Natarajan surrounded by envoys of the US, EU and key developing country players all trying to persuade her to sign off on an agreed formulation, is indicative of the substantial role that India could play in the climate negotiations. It also dramatically demonstrated India's isolation at Durban and how out of sync India was with the thinking among delegates.[30]

3. INDIA'S POSITION IN UNFCCC NEGOTIATIONS

To understand how India might move forward from here, it is useful to examine India's historical role in and positions taken earlier at the climate negotiations. Much as one may like to, space limitations do not permit a discursive examination of India's positions through the tortuous course of international climate negotiations over almost two decades, and interested readers may refer to some recent excellent review essays on this subject.[31] For purposes of this article, the main elements are summarised here even at the risk of over-simplification, so as to sketch the broad outlines of the Indian negotiating strategy and discuss how this could be recast.

In the initial years, India was among the pioneers of various crucial formulations that went on to define UNFCCC and Kyoto Protocol, including the key formulation that while all nations and people were responsible for anthropogenic climate change, some were more responsible than others, and that per capita national emissions constituted the best metric to represent the respective contribution of different nations as well as to determine their share of the burden towards its solution.[32] This principle of "common but differentiated responsibility" or CBDR, embodied in the UNFCCC,[33] has underpinned the Kyoto Protocol and all climate negotiations, until very recently. The idea of CBDR now constitutes a firewall between developed and developing countries has been sharply contested.

India, along with almost all developing countries in these early years, insisted that developed countries, being primarily responsible for the accumulated atmospheric GHGs, bear the main responsibility for the requisite emissions reduction as also for transfer of funds and technology to enable developing countries to cope with climate impacts and to adopt such mitigation measures as they can according to their "respective capabilities" or RC.[34] India played an important role not only in insisting on developed nations shouldering the emissions reduction burden but also in undertaking independent scientific studies and analyses to counter attempts, notably by the US, to shift blame for anthropogenic GHGs away from the fossil-fuel based power generation, transportation, industries and lifestyles of the global North to activities in the developing countries, such as paddy cultivation and animal husbandry accused of producing competing quantities of methane. There can be little doubt that it was the vigorous pursuit by developing countries including India of this position, with its strong ethical grounding and backed by the widely accepted numbers of per capita energy consumption and emissions in developed and developing countries respectively, which ultimately led to the signing of the Kyoto Protocol and its ratification even in the face of US opposition to it.

The course of international negotiations on the global emissions control regime covering the first commitment period of the Kyoto Protocol till 2012, and subsequently in relation to the modified regime expected to come into force post 2012, has of course undergone many changes over the past two decades, with numerous twists and turns. It is only to be expected that India's official stance too, as that of other countries, would have undergone shifts, keeping pace not only with the course of the negotiations but also taking into account the rapidly advancing science and the consequent understanding of climate change, its impacts and measures required for emissions reduction. The issue to be examined is what changes the Indian position has gone through, and the implications of these changes, both positive and negative, for India and the world.

Needless to say, there are many interpretations of the official Indian stance, ranging from staunch defence through nuanced critiques to outright opposition.[35] In the opinion of this writer[36] and several others,[37] the official Indian position, after its initial activism, gradually ossified into a rut of stonewalling defence. In the zeal to argue its position, India at times even appeared to verge on climate denial, taking the same side as the US, Saudi Arabia and similar others in negotiations. India seemed focused mainly on warding off mounting pressure on it to take on emissions cut obligations, and seemed fixated with funding and transfer of technology from the developed countries. These issues were and are undoubtedly important, even crucial. But officially India—along with governments of other large developing countries too, it must be said—has preferred to take a defensive position rather than adopting a pro-active stance and

working on or proffering any alternative burden-sharing schema for emissions control and for actions by developed and developing nations, remaining content with fending off threats and challenges posed by the US, EU and other developed countries. India seems therefore to be not responsive to the increasingly alarming findings of science, and also taking a blinkered view of related geo-political developments and realignment of forces as reflected in the global negotiations.

In the 1980s and 1990s, a clutch of large developing countries witnessed high economic growth prompting substantial changes in the geo-political realm, already being shaken up by the collapse of the Soviet Union and the Eastern European Bloc. The spectacular economic growth in China also saw it raise its political influence to dramatic new heights. New alliances and groupings were emerging. This process saw the big developed country powers seeking to draw the so-called "emerging powers" into their orbit on the major geo-political and global economic issues of the day, and also on the issue of climate change.

At the same time, the torrent of new scientific findings from IPCC/AR4 onwards, all conveying that the tipping point for irreversible climate change was dangerously close and that a climate catastrophe could well befall humankind if drastic emissions reduction actions are not taken very urgently, had far-reaching effect on perceptions among island states and LDCs. The former in particular see a very real existential threat, while the latter, particularly in Africa, foresee imminent grave challenges compounding the developmental problems they already face.

As noted earlier, IPCC/AR4 was a watershed in understanding the climate crisis. It certainly changed the momentum and dynamics of international negotiations. But it did not, as it should have, alter India's official stance. Nevertheless, India's position did indeed begin to shift, although not because of science which revealed the stark reality of the climate crisis and what both developed *and* large developing countries needed to do, but in an erroneous effort to synergise with shifting foreign policy goals and leverage India's economic growth story which had been gaining global prominence.

I have discussed at length elsewhere[38] that India, pursuing its new-found desire for a strategic alliance with the US that was now beginning to find more concrete expressions in a defence agreement and a nuclear deal, had apparently decided to go along with the US in various international and, of relevance to the subject of this article, in relation to climate change. The US on its part, after having been isolated over the Kyoto Protocol, was now reasserting itself in the global climate debate by pushing its own view and coercing allies and others into supporting positions, in keeping with the aggressive stance and climate perspective of the George W. Bush administration. In several G8 Summits starting from Heiligendamm in Germany in 2007, the US first managed to bring the EU on board a common position, the latter shifting ground considerably from its traditional "green champion" posture. India along with other large developing countries was invited to attend these G8 Summits and sit at the high table of international diplomacy.

India allowed itself to be herded into a common position with the US and other Northern nations at these summits of the "G8+5" which soon morphed into the so-called Major Economies Forum (MEF). As I have argued above, statements issued at these summits laid the foundation for the formulations at Copenhagen, Cancun and Durban, and which possibly form the core of the new climate architecture currently being negotiated. The goal of 2°C, mitigation efforts to be made by "all countries" and scant mention of the deep cuts to be made by developed countries, were all first enunciated in the MEF which in climate circles came to be known as the major emitters forum.

Undoubtedly, these large developing countries, notably China which was inching towards replacing the US as the world's largest emitter of GHGs on a national but not on per-capita basis, had been coming under increasing pressure from the US, EU and others to take on greater emissions control obligations.

After the Bali summit and in the run up to Copenhagen, in the face of this mounting pressure, China, Mexico, South Africa and Indonesia announced major unilateral emissions reduction commitments. India too unilaterally announced measures to reduce its emissions intensity by 20-25 per cent by 2020 compared to current levels, considerably less than China's pledge to reduce emissions intensity by 40 per

cent. India too formally placed this pledge on record at Copenhagen.

Here the US forged a common position with the G5 "emerging economies" including India and China, all reluctant to accept binding emissions cuts, and pushed through the pledge-and-review model of the Copenhagen Accord, leaving the EU out in the cold. US Secretary of State Hillary Clinton, in a signed op-ed article published during the Copenhagen conference[39] made clear that the Obama administration's position at Copenhagen was no aberration and represented continuity from the Bush era, and that the US indeed saw India and China as part of one club along with itself and therefore wanted a single climate treaty framework for everyone. Clinton wrote that success at Copenhagen required that "all major economies, developed and developing, need to take robust action to reduce their carbon emissions", that "they agree to a system that enables full transparency" (i.e. commitments by India and China too should be subject to verification as with developed country targets), and that the US had taken the lead to bring developed and key developing countries together to tackle climate change through initiatives such as the "Major Economies Forum…and agreements at the G-20 and the Asia-Pacific Economic Cooperation" meets.

At Durban, the EU in a sense turned the tables on the US by building a powerful coalition on the conference floor with the Africa Group, particularly with the island states, now widely seen as the conscience of climate summits, and secured acceptance of its proposal for a new legally binding instrument to succeed the Kyoto Protocol. This was not to the liking of the US even though the Durban Platform persisted with the idea of actions by all countries and low-ambition pledges by developed nations. The pressure of numbers, the clamour for a positive decision by the COP, and the powerful sentiment favouring concrete steps to tackle the climate crisis viewed as an existential threat by the island states and most LDCs, together pressured the US, China and some others into shelving their reservations, leaving India famously and petulantly alone.

India needs to seriously consider its complete misreading of the mood of the COP delegates representing most nations of the world, especially India's natural allies among the developing countries. India needlessly exposed itself to the poignant albeit incorrect perception[40] voiced by Grenada's lead delegate and spokesperson for the island states, that India wanted more leeway for development without committing to emission controls and implied that "while they develop, we die".[41] India's opposition to the EU proposal at Durban for a new legally binding instrument, even though no commitments had been spelt out, also baffled legal experts[42]. It is also regrettable that India has not sought out alliances with EU nations with whom, historically as well as by current governance structures and practices, India shares a common preference for regulation.

The global climate negotiations have of course always been about political economy and therefore bring geo-politics into play. Climate policy, though, requires a longer-term and truly strategic view that cannot be traded-off against or made subservient to foreign policy goals. Since India's position in climate negotiations has been so heavily shaped by its perspective on international relations, India should perhaps look to overhaul the diplomacy linked to its climate policy.

To be fair, India finds itself on a cleft stick, more so in recent years, due to its growing economy. This newly acquired stature, and India's enthusiasm in reorienting its foreign policy towards realising its great power aspirations, have brought with them expectations and obligations on the international stage. At the same time, despite India's supposedly booming economy, more than half its population continues to be mired in poverty with many development indicators at par with the poorest nations. India has not yet reconciled these contradictory trends in its development story and climate negotiating stance.

This may appear to be an unfair criticism of the official Indian policy stance, especially when weighed against the callous position of the US and its allies in the global North who, despite being responsible for over three quarters of the accumulated stock of carbon in the atmosphere, have consciously and consistently evaded their responsibility to clean up the pollution they have caused. The point being made here, however, is not that India carries major blame for the failure of the international climate negotiations. Rather, the argument here is that if the powers that be

had indeed taken a more serious view of climate impacts on India, then this country's official stance and its role in the negotiations would be quite different, and it may well have swung the balance of forces in favour of an effective and early closure.

India needs to re-evaluate the science and in that context what, along with other countries, it needs to do to combat the climate crisis. Lack of understanding of the need for serious mitigation action by India, and failure to integrate this into its negotiating position, has detracted from the positive role India had played in the early years of the climate negotiations, and contributed to the disconnect noted in recent times between India and other developing countries. Notwithstanding similarities in human development indicators between India and the LDCs, the Africa Group and the island states, it is evident that, along with deep cuts by developed countries, the emissions growth trajectory of India and other large developing countries especially China needs trimming,[43] and these countries have the capability to do this. This elephant has been in the room since release of IPCC/AR4 in 2007 which also called upon developing countries to "deviate below their projected baseline emissions."[44]

Again, as discussed in greater detail elsewhere[45], even simple back-of-envelope calculations would clarify the issue. Of the total global emissions of around 49 Giga tonnes (Gt) or billion tonnes of carbon dioxide equivalent in 2005, developing country emissions were already at around 26.5 Gt and were growing as a proportion of emissions by all countries since emission flows by most developed nations were levelling off. If global emissions are to come down by 50 per cent or about 24.5 Gt as called for by IPCC/AR4 by 2050, this obviously means that emissions by developing countries must come down even if developed country emissions are reduced to nil.[46] Detailed modelling exercises by scholars in India[47] taking historical emissions into account have brought out the kinds of moderated emissions trajectories that India may have to follow at current economic growth rates and to enable the global 2°C limit, along with similar trajectories for other developing countries of slower emissions growth gradually peaking and then declining sometime in the medium term, as well as immediate and deep emission cuts by developed countries.

The Indian government belatedly and after considerable prodding took cognizance of this in the lead-up to Copenhagen, but badly mishandled incorporating it into its basic negotiating position. The decision to reduce emissions intensity by 20-25 per cent below current levels by 2020 was announced by India much after China had declared a 40 per cent reduction in emissions intensity and also after South Africa, Mexico and Indonesia announced absolute cuts. Contrary to recommendations by experts, scholars and civil society organizations,[48] India made its announcement as a unilateral measure rather than as conditional upon deep emission cuts and transfer of finance and technology by developed nations.

Consequently, these significant mitigation pledges announced by India, China and other developing countries could not be used as leverage to extract deeper emission cut commitments from developed countries, and did not stand out in the public eye at Copenhagen. In fact, they were brushed aside as old hat during negotiations by the US and other developed nations who demanded further developing country concessions at the summit! This despite a confidential UN assessment that the voluntary commitments by developing countries totalled to about 5.2 billion tonnes, far exceeding those by industrialised nations amounting to only 2.1-3.4 billion tonnes.[49]

For all these shortcomings, the decision by India to slow down emission growth rates marked a significant shift in India's climate policy which had hitherto been glued to a do-nothing position. The earlier position that India was not required to do anything since it had not caused the problem, had substantial justification especially as it was in conformity with the Kyoto Protocol, even if it outlived its usefulness. But in the changed situation of high economic growth and related increase of emissions in India, combined with the compelling prognosis of IPCC/AR4, there is strong rationale for a position that India, now with undoubtedly greater capability than before, is willing to be part of the solution despite not having been part of the problem. The conditionality suggested above could be re-introduced under the Durban Platform process along with, as a bargaining chip, consideration of the legally binding option which India has little reason to fear.[50]

Based on the science and on the ethical principle of "common but differentiated responsibility *and respective capability*," adopting such a position as a well-reasoned choice, rather than merely taking a step or two in response to external pressure, has several features to commend it. It enables India to intervene in the international debate more positively and would demonstrate the country's seriousness about and responsiveness to the climate crisis and its grave consequences for itself, as well as other developing countries. Together with more pro-active diplomacy, it could be better leveraged to pressure developed countries on issues of concern to developing nations such as more ambitious mitigation targets and transfers of finance and technology. It would also bring India more in line with the thinking and approach of the LDCs, island states and many other developing nations.

4. THE INDIAN IMPERATIVE AND CLIMATE POLICY DISCORDANCE

India's position in the global negotiations, however, cannot be driven exclusively by its foreign policy or even by its perception of the impacts on India of external relations, as for example with foreign trade. As noted earlier, for too long India's position at the UNFCCC COPs have been delineated, mostly defensively, with reference to how its stance would be perceived by different nations or groupings and how any outcomes might impact India financially, or in terms of technology access, trade or other national interests. Even most of India's domestic climate-related measures were initiated by the Indian government as part of an externally driven agenda. India's assessment of climate impacts in the form of its National Communications to the UNFCCC, its National Action Plan on Climate Change, its decision to adopt an emissions intensity reduction target—all arose from a need to satisfy external interlocutors.

Surely the climate crisis, and the avowedly large magnitude of its impacts on India, should also have been a major driver of India's climate policy, both domestic and external, including in the negotiations. Regrettably, it has not been so. India may not be, like small island states, among the "canaries of climate change," the most vulnerable and in danger of disappearing altogether under rising sea levels. Nonetheless India is, along with other South Asian nations, among the most severely affected countries. India has close to 18 per cent of the world's population and, with a huge poverty and under-development burden, faces massive challenges in dealing with climate impacts especially on the most vulnerable sections of its people.[51] India has a large rural population and about 70 per cent of its people, mostly poor, are dependent on agriculture which, with over 60 per cent of the crop area being rainfed, is dependent on the monsoons and hence highly climate sensitive.

Let us examine these impacts in somewhat greater detail to better appreciate the vital national interests at stake.

As noted earlier, however much we may not like it, in the near to medium term temperature rise of somewhere around 2°C is probably inevitable given present emissions flow, likely emissions over the next decade or so, and the time lag between any changes in emissions flow and temperature outcomes. This will definitely result in some climate variations and related impacts. Therefore, regardless of what transpires over the next few years in the global negotiations, India (and other countries in tropical and sub-tropical regions) must prepare for the eventuality of some considerable impacts due to climate change.

India's Second National Submission to the UNFCCC in 2012 or NATCOM2 and a series of studies commissioned by India's Ministry of Environment and Forests under the Indian Network for Climate Change Assessment[52] contains the hitherto most authoritative estimates of climate impacts over the near to medium term, and some projections for the longer term till the end of the century.[53] The discussion to follow relies on NATCOM2 data unless specific studies are cited in some cases.

It is estimated that India will experience rise in average surface temperature of around 1.5-2°C by 2030, with higher temperatures in winter and spring, and rise in minimum temperature. While the total quantum of precipitation is not expected to undergo major variation, rainfall distribution is expected to vary considerably both spatially and temporally, with decrease in number of rainy days and substantial rise in number of heavy rainfall days. It has been observed that the heaviest 24-hour rainfall days happened during 1961-1980 with an "alarming rise of intensity" during 1980-2009. Delay in onset and withdrawal of the southwest monsoon has already been observed, and the trend is expected to consolidate. A reduction in discharge is expected in most major rivers and evapo-transpiration rates are estimated to increase by as much as 40 per cent given the higher rainfall intensity and poor recharge rates. Contrary to popular notion, and also going against the now-discredited and disclaimed "prediction" in IPCC/AR4 that Himalayan glaciers might "disappear" by 2035,[54] NATCOM2 makes the much more cautious estimation that while most Himalayan glaciers are indeed retreating, with increase in retreat rates from west to east, direct causality cannot be readily ascribed to global warming or climate change, and several other factors including local pollution might also be contributing to the retreat.

These substantial variations in temperature and rainfall, and consequent behaviour of river

systems, are expected to have considerable and important impact on agriculture, as may readily be appreciated. Of course, impacts on agriculture would vary substantially with type of crop, season, geographic location and so on, and these are discussed in some detail in NATCOM2 and in the reports from scientific institutions.[55] But some broad trends are discernible and may be summarized here.

It should be borne in mind that 60 per cent of crop area in India is rainfed, and 68 per cent of cultivated land vests with small farmers. Further, 40 Mha (million hectares) of cultivated land or around 12 per cent of the total area is flood prone, while 56 Mha or 18 per cent is drought prone. These snapshot figures indicate the extent of vulnerability in Indian agriculture and people dependent upon it.

With dry season river flows likely to be lower and wet season flows likely to be higher as a result of climate change, incidents and intensity of both floods and droughts are expected to increase. Other changes will worsen the already precarious situation on various fronts. For instance, fresh water availability per capita declined from 5177 m^3/year in 1951 to 1564 m^3/year in 2007; this near-crisis situation will worsen in future due to spatial and temporal variations noted above. Since India, and South Asia in general, already has low water storage capacity of about 250 m^3/capita compared to the ample 5000 m^3/capita in Australia and the USA, vulnerability of agriculture and farmers will heighten.

Due to temperature rise and these other contributory factors, foodgrain yield is expected to drop by 20-40 per cent by 2050. Wheat yields are likely to decline sharply, while rice yields are expected to drop due to both rise in average temperature and rise in minimum temperatures. Productivity of maize, sorghum and soyabean are also expected to decline. Apart from decline in yield quantities, protein content of grain may also drop because of the temperature variation. All these will overtake, by substantial margin, any gains in yield that may be expected from the anticipated rise in carbon dioxide levels. Pest infestation is predicted to increase and pests may spread to new areas by 2050.

Fish stocks too are expected to show variations especially in location of catch, breeding practices and harvests, even if total volumes may not drop to any major extent in the short to medium term. Livestock, especially ruminant animals, however, are expected to respond negatively to the severe thermal stress they would experience, with milk yields for instance expected to decline 1.5 per cent by 2020 and 13.5 per cent by 2050.

These impacts, besides pre-existing pressures of poverty and underdevelopment, will be crushing and will severely limit governmental and societal resources and capacities.

All these trends are likely to be more intense due to the widespread practice of monocrop farming, less diversity in varieties and crops, high-input agriculture, and lower prevalence of local drought-tolerant plant varieties and indigenous cattle breeds more tolerant of heat stress. These farming practices have been encouraged over many years by the dominant agricultural establishment pursuing the "green revolution" model. While these push output, at least temporarily, they have long-term deleterious effects such as degrading soil health, lowered ability to tolerate stresses and lower resistance to pests and diseases. Ironically, measures supposed to insulate agriculture from vagaries of nature have increased vulnerability to the wide-ranging environmental variability brought about by climate change. One expert has termed this "agriculture *against* nature" as opposed to the desired "agriculture *in* nature."[56]

Whatever the reasons, these impacts on agriculture are expected to result in a 10-20 per cent drop in farm incomes and a 5 per cent drop in GDP. And obviously, as we saw above, food security, especially of poorer sections of the population, is expected to be severely threatened.

India is also expected to experience sea-level rise and consequent impacts on habitats and livelihoods of populations living in coastal areas stretching over thousands of kilometres, even excluding the coastal areas around uninhabited islands in the archipelagos. Erosion of land alone due to sea-level rise is expected to affect millions of people in India and South Asia. Urban areas are expected to experience severe problems due to strain on urban infrastructure posed by extreme weather events such as heavy rainfall in short periods of time as witnessed in Mumbai and other parts of India in the past few

years. Increased activity of disease-carrying vectors as well as their spread to new areas due to climate variations is predicted to increase morbidity and the disease burden and heighten problems especially for already vulnerable infants, children, the infirm and the elderly.

With all these severe impacts deeply impinging on the survival and wellbeing of large sections of the population already reeling under the combined burdens of poverty, malnourishment and underdevelopment, India ought to have counted itself among the front ranks of nations most affected by climate change and, therefore, sent across a message as having a vital interest in bringing about a global emissions reduction and control agreement, thus minimizing the impacts of climate change.

Unfortunately, India has not viewed averting the climate crisis as among its priority goals at the UNFCCC negotiations where it has been more concerned at fending off developed country pressures to cut emissions and trying to improve India's access to international finance and technology transfer. If India does indeed take on achieving an equitable climate agreement as its main goal, its negotiating stance and related diplomacy would have a very different orientation and purposefulness.

In doing so, and if India did indeed adopt the position advocated above of offering to take on more emissions reduction provided developed countries undertake to the deep emission cuts required of them, such a stance would not be a concession from a position of weakness but a forceful move seeking to bring about an outcome vital to India's national interests and one that would therefore galvanize wide support in the international community.

None of this is to downplay or underestimate the extent of India's genuine dilemma, namely to work out a climate policy compatible with a large poverty and underdevelopment burden combined with having to face massive climate impacts in coming decades, while at the same time having significant industrial-economic strengths, technological capability and international standing which together bring with them some obligations to make significant contributions to mitigating global emissions. This dilemma, however, cannot be resolved in the international theatre alone, nor can they be compartmentalized and dealt with separately from each other.

India's climate policy today is derived rather heavily from external relations. But a climate policy without a sturdy domestic foundation will not only be inadequate, it will also be shaky especially in that it will lack a strong domestic constituency favouring climate action. Some official efforts at invoking domestic vulnerabilities to justify mitigation action by India, albeit done with good intentions of promoting domestic support, have conveyed the erroneous message that climate impacts in India could be ameliorated solely by Indian actions.[57]

No doubt there is today far greater awareness among policymakers and officials at the central government level, among academics especially in the premier institutions, and among sections of industry motivated by cost savings through energy efficiency or new business opportunities such as in carbon credits or renewables. However, those most vulnerable to climate impacts such as farmers, fisherfolk or other coastal communities, those suffering from energy poverty and the poor in general, are arguably the least involved in climate policy at any level. Indeed, how much the needs and interests of these sections are taken into account in formulating policy or in shaping and guiding programme implementation is a moot point.

These are important in themselves, of course, yet there is a double-edged problem with respect to climate policy. On the one hand, India's position at international climate meets will increasingly suffer in credibility if its rhetoric on equity in the international arena is not matched by comparable concerns and actions to address equity within India. The charge that India is "hiding behind the poor,"[58] even though not fully justified, has gained considerable currency. On the other hand, potential climate victims in India have little or no role in determining climate policy, even while developing countries as a whole, and island states and LDCs in particular, have acquired a substantial voice at the international level. The situation on both counts needs to change, urgently. What would a domestically driven, yet globally oriented fair, equitable and science-based Indian climate policy look like?

5. CONTOURS OF A RECONFIGURED INDIAN CLIMATE POLICY

Let us first look at global emissions control.

The key problem in the UNFCCC negotiations process is obviously a new schema for burden-sharing of emissions between nations. As we saw in Section 1, IPCC/AR4 had put forward emission reduction targets for developed countries in the range of 40 per cent reduction by 2020 and 90-95 per cent reduction by 2050 on the basis that these are the cuts required to stay under the stabilization level of atmospheric GHGs so that temperature does not rise above 2°C. In the ongoing discussions, the EU has offered only 20 per cent cuts by 2020 and some other similar numbers are doing the rounds. On the other hand, the Cancun pledges have nations fixing some numbers for themselves. In all these cases, the numbers do not add up to what is required by science and, just as important, there is no underlying principle or justification for the numbers. Till now, therefore, most schema appear to be built around some rather arbitrary numbers that are thrown around, some offering less, others pushing for more. Clearly, what is required is some principle based on which emission cut numbers for different nations can be derived, with the principle being anchored in the desired UNFCCC criteria and with emission cuts totalling up to what science calls for.

I shall discuss here one such evolving proposal based on a carbon budgets approach. This proposal has been advanced through a series of studies, modelling exercises and papers by a collaborative team of researchers in India at the Tata Institute of Social Sciences and the Delhi Science Forum (TISS-DSF).[59] Interestingly, this proposal along with others with a similar approach have also received at least indirect official support by India and other BASIC countries as evidenced by a broad endorsement at quasi-official BASIC meetings[60] and recognition by BASIC Ministers as a "contribution to the body of scientific knowledge informing policy development."[61]

This schema and associated models have thrown up interesting results and ideas for apportioning mitigation targets for *all* countries so as to keep global temperature rise to within the desired limits of 2°C temperature rise. Current versions of this work are based on cumulative emissions approximating to accumulated stocks, rather than annual flows. The essentials of this approach are briefly explained below.

Science tells us there is a finite limit to the total carbon the atmosphere can hold for the required temperature range. The TISS-DSF model allocates the remaining "carbon budget" to each country proportional to its population as its "fair share" after accounting for historical emissions. Each country is then required to cut emissions, or be permitted to increase them, till its "fair share" is reached. More than the detailed results or the model itself, which can be found in the referenced material, what is of interest here is that powerful ideas for national mitigation targets can be evolved based on a uniformly applicable criterion for *all* countries (interestingly in a *single framework* so dear to the US!) and science and ethics, rather than on apparently ad hoc numbers that can be discussed back and forth endlessly.

Similar carbon budget models are being developed elsewhere too[62]. Such ideas need not be rigid formulaic solutions, but can form a reasoned basis for further negotiation with all the flexibility and pragmatism required. As the BASIC experts put it, "a single analytical framework of allocation of carbon space may not work for some developing countries or meet their development needs. In practice, we will need a formula-plus approach which takes national circumstances of particular countries into account."[63]

The basic assumption in the model, as per the science, is that the atmosphere has a finite limit as to how much accumulated carbon it can hold above which the 2°C threshold will be breached and runaway global warming may result. The carbon being thus held is both a pollutant and a result of developmental activities for elimination of poverty and raising the wellbeing of people of all nations. This idea embodies a significant notion that the atmosphere is as a global commons whose fair and equitable use is essential and therefore the responsibility of all nations and their governments. The challenge therefore is a profound one from both scientific and ethical viewpoints: given the physical limit to the amount of carbon the atmosphere can hold, and the stocks of carbon it already contains due to historical emissions mostly by the developed nations, how should the remaining atmospheric

"carbon space" be apportioned among nations in a fair and equitable manner, knowing that nations have varying developmental needs and current as well as future potential rates of emissions growth?[64]

To cut a long story short, this modelling exercise led to some interesting conclusions. The model was run with the following conditions. Applying the principle of equity, all nations would be deemed to be entitled to a share of the global atmospheric commons, i.e. a share of the "total carbon budget" of the atmosphere, proportional to its population. For the future, say till 2050 or 2100, the amount of "carbon space" left for allocation among countries is the total carbon budget less the accumulated historical emissions of all nations. Each country then has an entitlement to a "fair share" of the remaining "carbon space," again proportional to its population, less its historical utilization. If a country such as a developed country has more than its fair share, then it needs to decrease its total emissions over the given period, if a country such as India has less than its fair share, then it can increase its total emissions till it reaches its fair share after which no increase is permitted.

The model when run for different conditions showed that total emissions by developed countries could come down to fair share levels in reasonable time frames, and that emissions from China, India and other large developing countries would grow latest till 2040 (much earlier in the case of China) and then start declining. The model also showed that even with such increases by China, India and other emerging economies, the IPCC's stabilization level of GHG concentrations and the 2°C condition are not violated.[65] In other words, a formula for equitable sharing of available carbon space between nations, based on total carbon budgets set by physical limits of the atmosphere to absorb carbon, is compatible with the requirements of the science, showing once again that science and ethical considerations are not mutually exclusive, nor are concepts such as justice and equity so subjective as to be incommensurate with science.

It is interesting to note that this carbon budgets approach has many advantages compared to the flow-based targets approach that gets so much attention in international negotiations now. (Of course, even national budgets expressed as total carbon stocks over a period of time would, for purposes of monitoring and timely action in case of slippages, also have to be translated into equivalent flows for any reasonable period such as annual, bi-annual, five-yearly etc.) First, the methodology takes into account historical emissions and works these into future targets, rather than specifying flow-based future targets and independently providing for some sort of reparations for past emissions. Second, as the model shows, such targets are well within the capabilities of both the developed and the large developing countries. Third, it provides a *single framework* for both developed and developing countries, a long-standing bone of contention for the US and some other developed nations vis-a-vis the differential standards of the Kyoto Protocol.

Some questions of equity, justice and fairness still remain, and point to interesting directions for future research on the carbon budgets approach, and also indicate that of course building in considerations of circumstances of specific countries into such a formula is not a simple affair, and several adjustments may have to be made.

The numbers computed for remaining carbon entitlements for some countries show a negative entitlement, in other words some nations such as the US have so far exceeded their allocation that they actually need to "remove" some of their carbon from the atmosphere to reach fair share. Needless to say, this is physically impossible, but equivalents could be found through such devices as planting sinks and so on, or even through reparations, which is an interesting way of allowing for fund transfers from developed to developing nations.

Another vexing issue is the starting year—which year should be taken as the starting point to estimate total carbon budget and national allocations with respect to population. The year 1750 marking the beginning of industrialization is often taken as the baseline in scientific literature. Others argue for 1850. The US has often taken the plea that it, and the industrialized North in general, cannot be held liable for actions taken before it was known that these actions were harmful or held to be illegal. Never mind that international law has, in many cases, rejected this "ignorance" plea, for instance in adjudicating compensation of different kinds for

takeover of indigenous peoples' lands by colonial administrations. Interestingly, in the modelling exercise referred to above, it was found that even taking 1970 as the starting year, by when the ill-effects of anthropogenic carbon emissions were well known and acknowledged including by official US bodies, would not make too much of a difference to the overall trends, so that could work as a bargaining position if necessary in negotiations![66]

At a seminar organized to discuss the carbon budgets proposals[67], some participants argued that the "argument for carbon budgets must be strengthened by a clear perspective on its ethical foundations..." particularly as to misgivings about whether the "right to carbon space" may be viewed as a "right to pollute" and, if so, what this does to the "polluter pays" principle. Perhaps the arguments made here have gone some way towards meeting this requirement.

Incidentally, the above carbon budget schema provides for India an "entitlement" of around 103 GtC between 2010 and 2050, and a potential actual budget for cumulative emissions of 48-65 GtC during 2010-2050.[68] Although this is not the place to discuss this in any detail, this budget for cumulative emissions is not too onerous for India, nor is it close to the business-as-usual (BAU) trajectory.

It is not being argued here that this is the only schema or approach, or even the best one that would deliver the desired results. Far from it: there will undoubtedly be others as the negotiations proceed. The point being made here is that such schema are out there, that it is indeed possible to configure burden-sharing schema that meet the requirements of science and equity, and which can satisfy differentiation between developed and developing countries as well as historical responsibilities. Is the schema perfect? Probably not. But at this point of time, it is probably a better and more worked-through schema than many others out there, and could well serve as a sound basis for discussions till something better comes up.

Let us now turn briefly to domestic policy.

India has put in motion several programmes aimed at mitigation of GHG emissions from India and, to a much lesser extent, at addressing some important adaptation issues chiefly in agriculture in which India expects to experience severe impacts, for example in its eight Missions under the National Action Plan on Climate Change[69] and in the ongoing work under the Expert Group on Low-Carbon Strategies for Inclusive Growth.[70] Limitations of space prevent even a cursory examination of the proposed measures, any assessment also being outside the scope of this essay. For purposes of this article, however, some features will be highlighted out if only to illustrate the main argument being advanced here.

Even votaries of these official programmes would agree that they are mostly sectoral in nature, with few linkages between them or with other developmental programmes,[71] and that unfortunately adaptation measures and addressing vulnerabilities especially of the poor, and particularly in the agricultural sector have been pushed to the background[72] while the missions have remained mainly mitigation-focused.

If India truly wishes to craft a low-carbon development pathway for itself that protects inclusive growth, that is to say, advances both overall economic growth and simultaneously redresses inequity within India, not through a trickle-down approach but by directly addressing inequalities in access to modern energy and provisioning of social and physical infrastructure, then a more holistic and integrated approach is required. In particular, it would be necessary to identify and tackle inter-sectoral linkages, cross-cutting issues and trade-offs between gains as regards one goal, say mitigation, vis-à-vis losses as regards another goal, say equity. For instance, interventions in public transportation must necessarily be conceived alongside urban planning and infrastructure. Also, a "Bullet Train" service and infrastructure may give a higher emissions reduction yield but might exacerbate inequity because of high costs involved.

The kind of emissions budget India might have as indicated above, or under some other global agreement that finally emerges out of the Durban Platform process, would have to be carefully integrated with an alternative development pathway that would, and should, look quite different from the current trajectory. India needs to address this issue differently than it has hitherto, and evolve a coherent methodology to do so. Such pathways and methodologies

to evolve them are yet to be adequately conceptualised and equity is far from being centre stage in such efforts.

Developmental benefits from climate policy are unlikely to trickle down to vulnerable sections and require to be specifically planned for and implemented. For instance, if electricity generation is increased through measures that lower emissions to enhance per capita energy availability, what measures require to be taken to ensure that the additional energy actually reaches un-electrified households in, say, rural areas?

Energy access by the poor, increased availability of public transport especially by rail in preference to road, rural employment and energy-saving enterprises particularly in the non-farm sector, retarding urbanisation rates, and other such measures will require substantial redirection of mainly public but also private investment. Along with climate-proofing and adaptation programmes, these would build a powerful support base for climate action by India and boost India's negotiating strength in international fora. The circle of India's climate policy dilemma cannot be squared unless domestic equity is addressed specifically and directly.

Some good initial steps have been taken in India to conceptualize and formulate a co-benefits approach to domestic climate policy, that is, policies that yield developmental benefits while addressing mitigation.[73] A recently published essay co-authored by this writer has taken the co-benefits discussion further and has also presented a methodology or tool using Multi-Criteria Analysis for use by policy-makers or analysts to evolve or assess policy measures vis-à-vis multiple objectives, that is, measures that would optimize benefits across the goals of carbon mitigation, local environmental and health, economic growth, and equity or inclusion, while also accounting for issues relating to implementation.[74] The different objectives to be so optimized could of course be varied in number or characterization. For instance, one could add other goals or treat them separately, such as treating health separately instead of subsuming it under local environment. One could also similarly look at climate resilience or adaptation programmes through the co-benefits lens. But the salient point for the present argument is that a co-benefits approach seeks to ensure that one outcome, carbon mitigation in this case, is not privileged in policymaking compared to other equally important developmental goals such as reducing inequalities in energy access, generating pro-poor livelihoods, improving habitat of the poor, and reducing vulnerabilities of the poor to climate change impacts.

Needless to say, such policy work addressing domestic inclusive low-carbon development needs to go hand-in-hand with work on an equitable global burden-sharing arrangement. Equity, social justice and science are at the heart of both, and each needs to inform the other. Both also need to be addressed with equal rigour and advocated with equal vigour. Climate change is a global problem calling for global solutions. However noble the intentions, a unilateral domestic agenda, especially in a country with such a low per capita contribution to global emissions, will not tackle climate change or alleviate its impacts on the nation, nor will it reduce global inequity which is at the root of the problem.

It would also be clear that India's demand for global equity in any international emissions control regime would gain force and credibility if complemented by, and seen to be in actuality so complemented by, a corresponding thrust on reducing domestic inequalities. And only a co-benefits approach would generate the broad-based social support necessary for policies that would entail, and hopefully lead to, substantive societal change.

Whatever be one's opinion about India's past positions, the very open-ended nature of the Durban Platform allows for new ideas to be put forward. If the Indian government wishes, it could take the initiative in advancing some new ideas and attempt to build a consensus around, or at least significant support for, a new emissions control architecture that satisfies the requirements of science as well as meets the criteria of equity, CBDR-RC and other UNFCCC principles.

Going forward, India would do well to go beyond its usual reactive and defensive positions in response to a schema put forward by the US or others, and promote new ideas of its own. It would be the icing on the cake if India could also simultaneously evolve and place on the table its own contribution to global emissions reduction,

worked out as part of an equitable low-carbon pathway consistent with its own domestic economic growth and developmental priorities.

Although it does not look like so far, with developed countries busy dismantling the Kyoto architecture rather than designing a new one, but sooner or later in the lead-up to the 2015 deadline, someone is going to advance some idea that will take root and become the core of the new post-Kyoto scheme of things. Why should this not be India, putting its best foot forward, and driving the discussions? Needless to say, this would need rigorous homework as well as patient, pro-active and visionary diplomacy. Also, as per the perspective advanced earlier in this section, formulating such a climate policy gives India an opportunity to address its main developmental concerns with co-benefits for the global and local environment. There is today a substantial body of work in India and sufficient capability both inside and outside government to enable this ambitious task.

On the other hand, if the government in India is reluctant or slow to take up this task, then think-tanks, social movements and other civil society organizations in India should take up this challenge in right earnest, and work together with similar and like-minded groups in other nations to build an effective coalition of ideas and advocacy that could engage with and seek to influence respective national governments and the international climate negotiations. There are several scattered efforts in different countries and by a few formal or informal international networks working in this broad direction. But this has not reached anywhere near critical mass, either in terms of ideas or in organizing coalitions. As much for civil society as for nations, and for the world, the time is now.

NOTES

1 Raghunandan volunteers with the Delhi Science Forum (DSF), a non-profit organization working in areas of interface between science & technology and society, and focusing on studies, awareness generation and advocacy on S&T policy issues. DSF is a founder-constituent of the All India Peoples Science Network, of which he is currently President. In DSF, Raghunandan contributes to research and campaigns in the areas of Environment, Climate Change & Water Resources, Aerospace, and Disarmament & Strategic Affairs. He currently leads the AIPSN campaign on Climate Change, conducts research and modeling exercises, and has published extensively in India and abroad with focus on India's climate policy and international negotiations. Raghunandan works professionally as head of the Centre for Technology & Development, New Delhi, a non-profit action research organization engaged in development and dissemination of technologies and systems for pro-poor rural enterprises and livelihoods. His academic background is in Mechanical Engineering with subsequent research qualifications and experience in Sociology.

2 This essay is a substantially expanded and modified version of an earlier article by the author titled "India's climate policy: squaring the circle," in *IDS Bulletin (Exchange), Vo.43(SPL), July 2012*, pp122-129

3 United Nations Environment Programme, *The Emissions Gap Report 2012*

4 IPCC/AR4 WG-III pp. 36-37&ff

5 UNEP Emissions Gap Report 2011; Kartha S. and Erickson P., "*Comparison of Annex 1 and non-Annex 1 pledges under the Cancun Agreements*", Stockholm Environment Institute, June 2011 (online) http://www.sei-international.org/mediamanager/documents/ Publications/Climate/sei-workingpaperus-1107.pdf

6 See Raghunandan D., "Hokkaido G8 summit and climate change" (online) in www.delhiscienceforum.net/environment/275-hokkaido-g8-summit-a-climate-change-8-05-mem16-o-html and other companion articles in the same website for a more detailed discussion of these developments in the G8/MEF

7 Most well-known climate models and the IPCC Reports themselves make many projections regarding different climate parameters in terms of a 50 percent probability of, say, temperature rising by 2 degrees C. While obviously necessary for model-building and predictive estimations, and which is eminently correct as regards rigour of analysis, this very degree of uncertainty reduces the usefulness of temperature rise as a metric for setting, monitoring and regulating global goals. Clearly, within the probability accepted by consensus in the scientific community, it is the causative emissions or the resultant GHG concentrations that can, and therefore should, be measured and used as a yardstick.

8 This important argument about stating global goals in terms of emissions or GHG concentrations rather than temperature rise has, to the best of this writer's knowledge, not been advanced in the literature, except by the author himself in Raghunandan D., "Durban Platform: Kyoto negotiations redux," Economic & Political Weekly, December 31, 2011, and is worthy of serious consideration.

9 See Declaration On Climate Change 2009, Alliance Of Small Island States (AOSIS), in http://sustainabledevelopment.un.org/content/documents/1566AOSISSummitDeclarationSept21FINAL.pdf

10 UNEP Emissions Gap Report 2012 available at http://www.unep.org/publications/ebooks/emissionsgap2012/

11 Ref ADP

12 See UNEP Emissions Gap Report 2012 (Executive Summary)

13 UNEP 2012 op. cit.

14 These estimates are made in a confidential UN report leaked during the Copenhagen Summit and reproduced in the Guardian of 17 December 2009 and available at http://www.guardian.co.uk/environment/2009/dec/17/copenhagen-emissions-cuts-future-temperatures accessed 1 March 2012

15 IPCC/AR4, WGIII, pp.36-37 & ff.

16 Mark Lynas, "How do I know China wrecked the Copenhagen deal? I was in the room," in http://www.guardian.co.uk/environment/2009/dec/22/copenhagen-climate-change-mark-lynas, Accessed June 24, 2013

17 Mario D'Souza, T.Jayaraman, Tejal Kanitkar, "Deconstructing the climate blame game," Economic & Political Weekly, January 2, 2010

18 Raghunandan D., various articles in DSF website at www.delhiscienceforum.net

19 For a discussion of developments at many COPs, see several articles by the author on the website of the Delhi Science Forum at www.delhiscienceforum.net

20 Raghunandan D., 2011 (EPW?)

21 Bidwai P., "Durban: road to nowhere," *Economic & Political Weekly*, December 31, 2011; Dubash N., "Looking beyond Durban: where to from here?," *Economic & Political Weekly*, January 21, 2012; Levi, M. "A misplaced climate celebration in Durban," (online) in *Energy, Security and Climate*, Council on Foreign Relations, in http://blogs.cfr.org/levi/2011/12/11/a-misplaced-climate-celebration-in-durban/#cid=soc-email-at-blogs-a_misplaced_climate_celebratio-121111 (accessed on 23 June 2013); Raghunandan D., "Durban platform: Kyoto negotiations redux," *Economic & Political Weekly*, December 31, 2011; Rajamani L., "*The Durban Dictionary,*" Indian Express, 25 December 2011

22 ADP available at http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_durbanplatform.pdf

23 For an analysis of this continuum from Copenhagen to Durban, see D.Raghunandan, Economic & Political Weekly, Dec 2011, op.cit.

24 Todd D. Stern, "Durban: an important step forward in combating global climate change," Huffington Post, 16 December 2011, available at http://www.huffingtonpost.com/todd-d-stern/durban-climate-talks_b_1153721.html (accessed on 11 November 2012)

25 Todd Stern, op. cit.

26 See D.Raghunandan, "A critical view of India's official position," pp. 174-175 in Navroz Dubash (ed.), "Handbook of climate change and India," (henceforth "Handbook") Oxford University Press, New Delhi, 2011; see also D.Raghunandan, "Hokkaido G8 Summit & climate change," [online] in http://www.delhiscienceforum.net/environment/275-hokkaido-g8-summit-a-climate-changeg8-o5-mem16-0-.html and other companion articles in the same website

27 ADP, op. cit.

28 ADP, op. cit.

29 See Lavanya Rajamani, "The Durban dictionary," Indian Express, 25 november 2011, [online] at http://www.indianexpress.com/news/the-durban-dictionary/880125/

30 See Bidwai P. 2011; Rajamani (2011), Raghunandan 2011; Dubash 2012 op. cit. for discussion of India's position and role in the Durban Summit

31 For an exhaustive decription and analysis of India's position from different perspectives, readers may see the collection of articles in Dubash, Navroz K. (ed) 2012, Chapters 7-12; especially Dubash (2012b) in the same volume for an analytical account of the various contending positions within India on India's negotiating stance and Sengupta, Sandeep (2012) in the same volume.

32 See Ghosh, Prodipto, "Climate change debate: the rationale of India's position," in Dubash N., Handbook on Climate Change and Dasgupta C., "Present at the creation: the making of the UN Frmework Convention on Climate Change," in Dubash N., Handbook on Climate change, op. cit.

33 UN Framework Convention on Climate Change, 1992, available at http://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

34 These terms are together referred to in the parlance as CBDR&RC but just CBDR is more commonly used, to the considerable detriment of understanding of and contributions to the debate arising from neglect of the important role played by capacities of countries to respond to climate challenges with respect to both mitigation and adaptation

35 See Navroz Dubash, Introduction to Chap 3 in Dubash N. (ed), "Handbook" op. cit.

36 See several Articles by the author in www.delhiscienceforum.net

37 See various essays in Dubash N., "Handbook" op. cit.

38 D.Raghunandan in Dubash N., "Handbook" op. cit. ,; see even more detailed accounts following the G8 Summits at Heilingendamm, L'Aquila and Toyako in various articles by the Author in www.delhiscienceforum.net

39 Hilary Rodham Clinton, "The US is on board," International Herald Tribune, 15 December, 2009, available at http://www.nytimes.com/2009/12/15/opinion/15iht-edclinton.html?_r=0 accessed on 24 June 2013

40 The perception that rising emissions of some large developing countries such as India is the dominant or even major factor causing climate change is erroneous in that temperature rise and other climate effects are caused by the accumulated concentrations of GHGs in the atmosphere rather than by current flows. India's cumulative emissions or contribution to stocks is substantially lower than most developed countries and even its current per capita flows are roughly a quarter of the average for developed countries. The notion that somehow it is developing countries that are now mainly responsible for climate change has been assiduously, and apparently successfully, disseminated by many developed countries especially the US. However, the idea that rising emissions from large developing countries will increasingly represent a major problem for climate management is correct and has been discussed extensively in this article.

41 Black, Richard, 2012: "Climate change talks end with late deal," 11 Dec 2011, BBC, in http://www.bbc.co.uk/news/science-environment-16124670

42 Rajamani L., 2011, op. cit.

43 Quantum of emission reductions by large developing countries, when such emissions should peak and so on are not discussed here for want of space. Suffice it to note that absolute cuts by developing countries are not envisaged in the short term, and that developed and developing countries need to have different peaking years. For further discussion on this, see Kanitkar T., et al (2010), Jayaraman T. et al (2012)

44 IPCC/AR4 WGIII pp. 89-90

45 Raghunandan D. et al, "*Climate crisis: challenges and options*," All-India Peoples Science Network & Tata Institute of Social Sciences, Delhi, 2007

46 Due to space constraints, I have not discussed here the important issues of when developing country emissions should peak and then start to decline, or the crucial determining role that accumulated *stocks* of carbon in the atmosphere rather than its annual emission *flows*, the former including historical emissions, play in determining climate change and global average temperature.

47 Kanitkar T. et al, "*Global carbon budgets and burden sharing in mitigation actions*" in Papers of Conference on Global Carbon Budgets and Equity in Climate Change, Tata Institute of Social Sciences, Mumbai, 2010

48 Raghunandan D. et al (2007) op. Cit.; Campaign for Progressive Climate Action and Policy, "India's position on Climate Change: Statement submitted to PM," 2009, (online) in http://progressiveclimatepolicycampaign-ind.blogspot.in accessed 2 March 2012

49 These estimates are made in a confidential UN report leaked during the Copenhagen Summit and reproduced in the Guardian of 17 December 2009 and available at http://www.guardian.co.uk/environment/2009/dec/17/copenhagen-emissions-cuts-future-temperatures accessed 1 March 2012

50 Desai, N., "*Momentum from Durban"*, Business Standard, Delhi, December 15, 2011

51 Most of the climate impact data in the following section are taken from the "India: second national communication to the United Nations Framework Convention on Climate Change," 2012, (henceforth NATCOM2) available at http://moef.nic.in/downloads/public-information/2ndNational_Communication_2_UNFCCC.pdf

52 "Climate Change and India: a 4x4 assessment --- a sectoral and regional analysis for 2030s," Indian Network for Climate Change Assessment (INCCA) Report #2 (henceforth INCCA 2), November 2010, available at http://moef.nic.in/downloads/public-information/fin-rpt-incca.pdf

53 Some people may hold an opinion that some other studies show different and more accurate estimates. However, as with the IPCC Assessment Reports, I have preferred to go with the NATCOM and related studies in the INCCA2 as the most reliable evidence at hand unless established otherwise in a fairly conclusive manner through other widely accepted peer-reviewed studies.

54 This unfortunate comment in IPCC/AR4/WG-3 did much to discredit the IPCC Report and call into question the robustness of the IPCC

processes. Needless to say, the unsavoury episode was hugely played up and exploited by climate sceptics and others who wished to downplay the reality of climate change and the urgent steps required especially as regards fossil fuels. Although the IPCC subsequently issued corrections and clarifications , considerable damage had been done. It must be noted that the erroneous comment in the Report had origins in an unverified report by one particular NGO, which was repeated in a report of another NGO! IPCC has now revised its procedures regarding reports in such 'grey literature."

55 See especially NATCOM2 and INCCA 2

56 Raina, Rajeswari in Dubash N., "Handbook," op. cit.

57 See Arti Dhar, "Indias stand on climate change principled: Jairam Ramesh," The Hindu, http://www.hindu.com/2009/10/13/stories/2009101355371100.htm.

58 This was the evocative title of a report published by Greenpeace India in November 2007: the reference here is not intended to cite this Report or to draw any inferences from it.

59 See Jayaraman T., Kanitkar T., D'Souza M in Dubash N., *"Equity and burden sharing in emission scenarios: a carbon budget approach"* in Dubash, Navroz K. (ed) (2012) op. cit. 2012; Kanitkar T. et al, *"Global carbon budgets and burden sharing in mitigation actions,"* op. cit. 2010

60 See "BASIC Experts Meeting, New Delhi: Summary of Discussion, February 26, 2011," available at http://moef.nic.in/downloads/public-information/BASIC%20Experts%20Meet%20-%20Summary%20of%20Discussions.pdf accessed on 18 December 2012

61 "Joint Statement issued at the conclusion of the Seventh BASIC Ministerial Meeting on Climate Change, Zimbali, Durban, 29th May 2011", available at http://moef.nic.in/downloads/public-information/Joint%20statement%20BASIC%2029th%20May.pdf accessed on 18 December, 2012

62 See for instance German Advisory Council for Climate Change, "Solving the climate Dilemma: the budget approach" (2009; Paul Baer, Tom Athanasiou, Sivan Kartha & Eric Kemp-Benedict, "The Greenhouse Development Rigts Framework: the right to development in a climate constrained world," (2nd edition), November 2008, available at http://gdrights.org

63 See "BASIC Experts Meeting, New Delhi: Summary of Discussions," op. cit.

64 Kanitkar, T. et al, 2010, op. cit., pp. 36 & ff)

65 See Kanitkar et al (2010) for detailed results of the model runs and explanations of these results.

66 See Kanitkar T., et al (2010) op. cit.: pp.42-43 for detailed discussion on the starting year

67 See "Summary Report of the Conference" in Kanitkar T., et al (2010): p.33

68 See T.Jayaraman et al (2010), op. cit.pp.67-70

69 "National Action Plan on Climate Change," Government of India, 2009, available at http://pmindia.gov.in/climate_change_english.pdf accessed on 18 December 2012

70 See "Interim Report of Expert Group on Strategies for Low-carbon Inclusive Growth," Planning Commission, Government of India, 2011, available at http://planningcommission.nic.in/reports/genrep/Inter_Exp.pdf accessed on 18 December 2012. In the interests of full disclosure, it should be mentioned that the author served as a Member of this Committee from its inception till June 2012 by which time its final report had not been completed or released

71 See for instance Sujatha Byravan and Sudhir Chella Rajan, "An evaluation of India's national action plan on climate change," Centre for Development Finance, IMFR and Indian Institute of Technology, Madras, 2012, available at http://www.indiaclimatemissions.org/download/NAPCC%20Evaluation.pdf

72 Raina R., op.cit

73 See Dubash N., "Introduction" in Dubash N. (ed) 2012, op. cit., pp.16-18.

74 Dubash N., Raghunandan D., Sant Girish, Ashok Sreenivas, "Indian climate change policy: exploring a co-benefits based approach," Economic & Political Weekly, June 1, 201


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