

The equitable sharing of atmospheric and development space: Summary

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In the quest for an international climate agreement on actions to address the climate change crisis, three aspects have to be the basis simultaneously: the environmental imperative, the developmental imperative, and the equity imperative. This EDE formula requires that the different pieces of the climate negotiations be seen and addressed as a whole, in a holistic way. In particular, setting the global goal for emission reduction has to take account of the environmental imperative, and also deal with the emission reduction of Annex I and non Annex I parties. A global carbon budget of how much more emissions should be allowed between now and 2050 should be fixed, and also how that budget should be allocated especially between developed and developing countries.

Thus a fixing of a temperature target and of a global emissions reduction goal must be done within a paradigm or framework for the equitable sharing of the atmospheric space and the development space. The sharing of the mitigation efforts, and the support (finance and technology transfer) that must accompany this sharing, is a most critical piece of the jigsaw puzzle.

The UN Climate Convention recognises the equity principle; that developed countries take the lead in emission reduction, and that developing countries have development imperatives, and their ability to undertake climate actions depend on the extent of support they receive from the developed countries. Annex I countries will also meet the **agreed full incremental costs** of implementing developing countries' climate policy measures.

CARBON BUDGET AND ITS SHARING

The historical situation: Between 1850 and 2009, about 1,280 Gigatons of CO₂ were emitted, thus adding to the stock of CO₂ in the atmosphere. To achieve a 67% probability of limiting temperature rise to within 2 degrees, CO₂ emissions in 2010-2050 must be kept to below 750 Gt; a 75% probability requires a 600 Gt budget.

In the historical situation, estimates for the fair share for developed and developing countries is based on proportion of population for 1850 to 2008. Cumulative global emissions have totalled about 1214 Gtons in 1850-2008. Of this total, Annex I countries accounted for 878 Gton or 72% of the total. Their share of population was about 25%, so their fair share was 310 Gton. and their overuse was 568 Gton. Non Annex I countries accounted for 336 Gton or 28% of the total. Their fair share was 904 Gton and under-use was 568 Gton.

The carbon debt of Annex I countries was thus 568 Gton for the period 1850-2008. They are still accumulating debt because their actual emissions as a group in 2009 still exceeds their fair share.

In sharing the remaining carbon space in 2010-2050 two concepts are needed: (1) The allocation of carbon space as according to rights and responsibilities; (2) The actual carbon budget (and related physical emissions reduction schedule) that countries eventually put forward as what they can physically undertake.

There could be a difference between the allocation of responsibilities and rights, and the actual emissions reduction or related budgets. Therefore: Countries that cannot meet their allocated budget or emission cut can compensate for this unmet part of their obligation and countries that do not make full use of these rights, can obtain the funds for their actions.

In any calculation of the sharing of remaining carbon space, the carbon debt owed by Annex I countries at the end of 2009, i.e. 568 Gton of CO₂, should be taken into account. Thus in the 2010-2050 carbon budget: If a total budget of 750 Gton is taken, and Annex I population ratio to world population is 16%, then the Annex I fair share is 120 Gton. However to fully discharge its carbon debt (568 Gton) as at 2009, its allocation for 2010-2050 is a negative budget of 448 Gton. Developing countries with an average population ratio of 84% would have a fair share of 630 Gton of the total 750 Gton budget. However since it has a credit of 568 Gton in 2009, its allocation for 2010-2050 would be 1198 Gton.

A similar calculation can be done for other budgets (eg 600 Gt).

Critique of existing proposals on global emissions reduction: The main proposal (from some Annex I parties) is for a 50% global emissions cut by 2050 (compared to 1990) and a 80% cut for Annex I parties. This proposal has several problems. Firstly, the 50% global cut is environmentally not ambitious enough. It would correspond to a carbon budget far above the minimum 600 Gton or 750 Gton in 2010-2050.

Secondly, the implied distribution of the carbon budget is unfair. It gives Annex I countries a budget share of 30-35 per cent, compared to their 16% share of world population in this period. Thirdly, acceptance of this proposal means accepting not only the unfair distribution of the 2010-50 carbon budget, but also writing off the 1850-2009 cumulative debt of developed countries. Fourthly, accepting these figures (50%, 80%) implicitly accepts a specific emissions cut target for developing countries, and locking in this whole distribution of carbon budget and set of emissions cuts.

In 1990 the global emissions of all Greenhouse gases was 29.7 Gton (per capita emissions of 5.6 ton). Annex I emissions were 18 Gton (15.3 ton per capita) or 60% of the total. Non Annex I emissions were 11.7 Gton (2.9 ton per capita).

By 2050, a global cut of 50% from 1990 would bring global emissions down to 14.9 Gton (1.6 ton per capita). An 80% cut by Annex I would then result in the following in 2050: Annex I emissions would go down by 80% to 3.6 Gton. Non Annex I emissions would go down by 5% to 11.4 Gton; its per capita emission would be 1.5 ton or 50% below 1990 levels. Non Annex I countries would have a drastic cut by half in per capita emission levels. The Non Annex I cut is even higher compared to the 2005 level; it would be 42% (absolute) and 60% (per capita).

So, in order to fulfill the environmental goal of a global cut of 50% to 85% (and the upper end is more appropriate to approach the required global carbon budget), it is clear that developed countries will have to go into the territory of "negative emissions", in order that the developing countries can have a decent level of "development space" through being allocated allowed emissions sufficient to cushion their path to low-emissions growth. For a global cut of 50% below 1990 levels, the following are some conclusions:

-- If the Annex I countries cut emissions by 80%,

then developing countries would have to cut their per capita emissions by 50%, to 1.4 ton. To avoid a per capita emission cut by 2050, developing countries would retain a level of 3 ton per capita, Annex I countries would have to cut their total emissions by 147% i.e. cut by 100% to zero and then cut by another 47% to reach a level of negative 8.4 ton.

-- If a goal is set for developing countries (NAI) to double their per capita emission (to allow for development space), Annex I has to cut its aggregate emissions by 277%. This frees the space to enable developing countries to have 46 Gton of emissions.

-- If Annex I cannot realistically meet the targets set especially at levels higher than 100%, then the mechanism of compensatory payment to developing countries to assist in fulfilling the allocated targets can be used, as discussed earlier.

Per Capita Emission and Equity: Having equal emissions per person or country, though at first sight a good principle, in fact would not result in an equitable outcome, as countries and persons have different capacities as a starting point. Developed countries have far better developed infrastructure built using cheap fossil fuels; superior levels of technology; greater human and organizational capacity, and higher incomes.

Thus, if a level of 1 ton per capita is chosen as a "sustainable level", they have the capacity to reach this level while retaining present levels of per capita income. However a country that now has a per capita emission of 1 ton of emissions or below may retain that level and not be able to climb up the income scale, so that its economic level remains low. Also, developing countries that are currently at moderate emission levels of 3-8 tons per capita would find it difficult to reduce their emissions and maintain economic growth.

Thus, to oblige the different countries to have the same per capita emission level (say, by 2050) would be to "lock in" the economic disparities. On the other hand, the concept of per capita emissions equity is a useful one, if all countries are at the same or similar levels of development. One possible approach is to retain the aim of having an equal per capita emission by a certain year, but to provide countries with coefficients. Thus a country that is much poorer and lacks in infrastructure and technology could have a "multiplier" of 5 or 10 to apply to its coefficient of 1.

The greatest challenge to developing countries is to decouple conventional economic growth from emissions growth. This can be achieved adequately only with international cooperation in transfers of finance and environmentally-sound technology. Higher lev-

els of finance and technology transfers would lead to a greater efficiency in terms of lower emissions per capita while allowing GNP per capita to grow, and enable mitigation actions of developing countries.

THE FINANCE ISSUE IN THE EQUATION

Resolution of the climate debt: One method of discharging the climate debt obligation (568 Gt at end-2008) is to assess its value and planning its repayment. The economist Nicholas Stern has said : "If the allocations of rights to emit in any given year took greater account both of history and of equity in stocks rather than flows, then rich countries would have rights to emit which were lower than 2 tonnes per capita (possibly even negative) The negotiations of such right involve substantial financial allocations: at \$40 per tonne CO₂e a total world allocation of rights of, say, 30Gt (roughly the required flows in 2030) would be worth \$1.2 trillion per annum".

A carbon debt of 568 billion tonnes, valued at \$40 a tonne, would be worth \$23,000 billion. An amount like this, contributed to a Fund to be accessed by developing countries, would go a significant way to support and enable their climate actions. Divided into 40 instalments, this is a sum of \$600 billion a year or 1.5% of the current GNP of developed countries.

Financing for mitigation: The World Bank estimated that: "In developing countries mitigation could cost \$140 to \$175 billion a year over the next 20 years (with associated financing needs of \$265 to \$565 billion)." .If the stabilisation target is more ambitious than the 450 ppm chosen, the mitigation costs to developing countries would go up correspondingly.

A study in India (by the CSE) of the six most emissions intensive sectors to determine India's low carbon growth options concludes: "There is no real way we can reduce emissions without impacting growth once we cross the current emissions-efficiency technology threshold...It is for this reason that India (and all other late entrants to the development game) must not give up on their demand for an equitable global agreement." For the power generation sector, a low-carbon strategy could reduce emissions in India cumulatively by 3.4 Gton by 2030-31. The additional cost of generating power from renewable technologies in the low-carbon strategy over business-as-usual until 2030-31 is estimated at 8470 billion rupees (US\$203 bil) at 2010 constant prices, or about \$10 bil a year. This also means an average cost of 2,500 rupees, or \$60 per tonne of CO₂ emissions avoided, a rate far above what has been previously estimated by other studies for developing countries (for example, a UNFCCC report on financial flows concluded that most

of the emission reduction potential in developing countries can be realised at a cost of below \$25 per ton).

Financing for Adaptation. Most of the studies on adaptation funding needs are limited in scope. The World Bank's recent report estimates the cost at \$75 billion to \$100 billion a year. In its scenario of \$102 bil adaptation cost, the costs are \$29 bil for East Asia/Pacific, \$23 bil for Latin America and Caribbean, \$19 bil for Sub-Sahara Africa, \$17 bil for South Asia, \$11 bil for Europe and Central Asia and \$4 bil for Middle East and North Africa. The Bank's estimate is higher than the UNFCCC's financial flows report (at \$27 to \$66 bil a year).

The most comprehensive estimate is a IIED-Imperial College study led by Martin Parry. It found that the UNFCCC report had significantly underestimated adaptation costs because it left out several sectors and under-stated the costs in the sectors it covered by 2 to 3 times. Using the methodology and figures of this study, the adaptation cost for developing countries may come up to \$450 billion annually.

Financing for technology cooperation and transfer: The UNFCCC's expert group on technology (EGTT) estimates the total finance needs are \$300-1,000 billion a year; with developing countries' additional funding needs of \$182 - 505 billion a year, for deployment and diffusion of technology. This does not include research and development or demonstration costs in developing countries.

IMPLICATIONS FOR NEGOTIATIONS

(a) Shared Vision: In the negotiations on shared vision, developing countries have argued that a decision on a global goal (whether temperature limit or global emissions reduction) should be in the context of equity and to be preceded by a paradigm for the equitable sharing of the atmospheric space or resource. This should also be the case for the wording on a global peaking year.

This is a correct position because the global goals for temperature and emissions reduction have implications for the responsibilities of developing countries or for their options in their emissions and thus their economic pathways. This principle of equity in the sharing of atmospheric space has to be operationalised with the use of carbon budget and debt concepts. The data on fair shares and actual emissions and thus on debt/surplus also have major implications for the sharing of the carbon space in the 2010-2050 period, and thus of the allocation of emission obligations and rights as would be ex-

pressed in the shared vision's important element of "global goal for emissions reduction."

(b) Mitigation: The concepts and figures on cumulative emissions and carbon debt/surplus make it clear that Annex I parties must continue to "take the lead" in emissions reduction. Thus in the current negotiations for the mid-term up to 2020, and even in the discussion on 2050 targets, there should not be an "escape" from this leadership responsibility by arguing that certain developing countries have to join in the effort if there is to be a binding obligation on Annex I parties. Or that they would not want to have a binding commitment on emissions reduction because developing countries are "not prepared to join in". The reiteration of historical emissions and historical responsibility and carbon debt are relevant in an argument in favour of binding targets for developed countries, for the continuation of the Kyoto Protocol and for the comparable effort for those Annex I parties that are not in the KP.

It must be recognised that if developed countries undertake only weak targets for the next commitment period and their emissions are only reduced a little (or even increases), then there is even less carbon space left for developing countries. The present pledges made either in the Copenhagen Accord or previously compiled (by the Secretariat) in the Kyoto Protocol working group are simply inadequate. Various analyses show that the Annex I (including the US) pledges add up collectively to only a 16% reduction (by 2020 compared to 1990) at best and if loopholes (through LULUCF and AAUs) are taken into account there can even be a 6.5% increase in Annex I emissions.

(c) Finance: One way in which the historical carbon debt that developed countries hold may be discharged is through compensation into a UNFCCC Fund. This could be a lump-sum payment or payments over the 40 years 2010-2050 in yearly instalments. Besides this, the developed countries have obligations under the UNFCCC to meet mitigation, adaptation and capacity building expenses. The quantum of funds for discharging the carbon debt

and for meeting the additional costs are large, but this is to be expected since the financial requirements of adaptation, mitigation, capacity building and technology are massive. The amounts so far announced (\$10 bil a year from 2010, and \$100 bil by 2020 are inadequate.

(d) Technology Transfer: To play their extremely ambitious and difficult role, developing countries need a tremendous technological leap involving access to climate-related technology at the most affordable rates. The following measures are proposed: (1) They must have the maximum access at least cost to the best technologies; (2) Barriers to technology transfer must be addressed, including the issue of IPRs; (3) Developing countries must be assisted in the development of endogenous technology and to undertake their own R and D and develop innovation, with international support; (4) R and D activities should be financed by UNFCCC funds, and the products from these should be in the public domain; (5) Sufficient funds should be provided for technology development and transfer to developing countries.; (6) A Technology Policy Board or Council should be set up under the UNFCCC to address the technology issues.

NOTE: A more detailed paper on this topic can be found on the South Centre website

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