Historical responsibility as a guide to future action in climate change

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- UNFCCC Preamble: “Noting that the largest share of historical and current global emissions of GHG has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,”

2 approaches showing global emission cut and implications regarding historical responsibility

-- Residual cut versus Negative emission

-- Carbon budgeting and fair shares to carbon or atmospheric space

Concepts, principles

- Rights to fair allocation of atmospheric space
- Rights to fair share of development space
- There can be a difference between what a party is assigned to do (responsibility or obligation) and what it actually does. It can compensate for the difference

What the science and equity tells us

- Limit GHGs in the atmosphere to 450 ppm or even 350ppm
- Cut emission globally by 50% or 85% by 2050 vis-à-vis 1990 level
- Key task: How to assign the tasks between annex I and non annex I in a fair manner reflecting CDR including historical responsibility and the need for development

Scenarios of tasks for 50% global cut by 2050 (1)

- Reference 1990: Global C02e emission 38 billion tonnes
  Industrial countries – 18 bil ton
  Developing countries – 20 bil ton (per capita 5 ton)

Scenario 1: 50% global cut; 80% annex I cut
Total emission – 19.3 bil ton
Industrial countries – 3.6 bil ton (80% cut)
Developing countries – 15.7 bil ton (Implicit residual cut of 20%); Per capita emission is 2 ton (60% cut from 1990) as population doubles from 4 to 8 bil. people

Scenarios of tasks for 50% global cut by 2050 (2)

Reference 1990: Total emission 38 bil ton

Industrial countries – 18 bil ton; Developing countries – 20 bil ton (per capita 5 ton)

Scenario 2: 50% global cut; 100% annex I cut

Total emission – 19 bil ton

Industrial countries – 0 ton (100% cut)

Developing countries – 19 bil ton (5% cut)

Per capita 2.4 ton (52% cut)

Scenarios of tasks for 50% global cut by 2050 (3)

- Reference 1990: Total emission 38 bil ton
  Industrial countries – 18 bil ton
  Developing countries – 20 bil ton (per capita 5 ton)

- Scenario 3: 50% global cut; same per capita emission in developing countries (1990, 2050)

  Total emission – 19 bil ton
  -- Industrial countries – minus 20 bil ton (213% cut): this implies “negative emission”
  -- Developing countries – plus 40 bil.ton (100% rise) to enable per capita to remain at 5 ton (no change)

Guide for future action

- Make use of “Negative emission” as concept in assigning of tasks
- It is possible to assign task to Annex I of cutting emissions by more than 100%
- In Scenario 3, Annex I task is 213% cut, or from + 18.2 bil ton CO2e to – 20.5 bil ton CO2e emission:

  through (a) net creation of sinks or (b) request others to assist it fulfil task or (c) Other

Example: Undertake actual cut from 18 bil ton to 0; Compensate others to undertake remaining 20.5 bil ton emission cut or sinks creation. UNFCCC can seek agreed methods of compensation (eg contribution to Fund)

- There can be difference between Task Assigned (obligation) and Actual Task Done.
- Caveat: There is a danger in “Offsets” or Too Many Offsets

Inequity in proposed 2020 targets for Annex 1 and Developing Countries

An example of inequitable assigning of tasks: 2020 targets scenario (vis-à-vis 1990) as being proposed eg by the EU

30% cut Annex 1 countries.

Take the example of a high-emitting Annex 1 country: Its per capita emission would only go down from 20 to 14 ton per capita

Meanwhile, developing countries are asked to have 20% deviation from baseline. Thus a dev. country with 2 ton per capita would have to restrict emission to 2.6 ton, or even less (if population growth is taken into account).

Even if the Annex I country were asked to cut its emission by 40% instead of 30%, its per capita emission would only go from 20 to 12 ton. While the developing country with emission of 2 ton per capita would be restricted to only 2.8 ton (and much less if population growth is taken into account).

In this system, the gross inequality in per capita emission remains, and now the developing countries are also asked to face new constraints or limits.

Fair carbon budgetting (1)

- **A system of fair carbon budgeting should be introduced instead.**
- **The world has only 600 giga ton of carbon emission to budget between 1800 to 2500, assuming the 2500 emission level is 50% below the 1990 level. (Note: Figures are in carbon and not CO2).**
- **Given population ratio, the equitable share of annex I countries is 125 GtC of the total 600. Non Annex I should be allocated 475 GtC in an equitable system.**
- **But Annex I has already consumed (in years 1800 to 2008) 240 GtC, which is 115 GtC above its fair share of 125 GtC.**
- **And given the scenario (global cut by 50% by 2050 and Annex I cut of 85%), Annex I will consume another 85 GtC from 2009 to 2050.**
- Thus the total Annex I consumption is 325 GtC in all, from 1800 to 2050. Since its fair share is 125 GtC, there is a Carbon Debt of 200 GtC.

Carbon budgeting (2)

- On the other hand, if there was a fair sharing of allocation of carbon space, developing countries have a share of 475 GtC for years 1800 to 2050.
- However the situation till 2008 plus the scenario if accepted for 2008 to 2050 (i.e. global cut of50% and annex 1 cut of 85% between 1990 and 2050) would mean that developing countries can in actual fact only emit 275 GtC in all. Thus they are under-consuming by 200 GtC.

Fair carbon budgetting (3)

- If the scenario is to be agreed to (50% global cut plus 85% annex I cut by 2050) then Annex I should compensate by 200 GtC (gigatonne of carbon, not carbon dioxide) to developing countries.

- If Annex I were to undertake greater emission cuts between now and 2020, and between 2020 to 2050, its carbon debt would be less.

Actual vs Fair Carbon Budget

in gigatonne carbon emission

	1800-2008	2009-2050	Total	Fair Share	Debt
Annex I	240	85	325	125	200
Non A1	91	184	275	475	-200
Total	331	269	600	600	0

Data assumes 50% global cut and Annex1cut by 85% in 1990-2050

Fair share assumes carbon emission is based on same ratio as population

Debt is the difference between total emissions and fair-share emissions. Minus sign denotes there is a “surplus” rather than a “debt”

Historical Responsibility and Carbon Debt: Guide to Action

- Calculate the “carbon debt” overall and of each country
- Discuss how to address carbon debt

  E.g. it can be the basis of one of sources of UNFCCC Fund

  Step 1: Estimate mitigation & adaptation needs of developing countries; and technology and capacity building needs

  Step 2: Calculate annex 1 contribution to fund, according to climate debt or according to a percentage of GNP

Historical Responsibility and equity in Per Capita Emission

- Is per capita equity in emissions a fair goal? It is a pertinent factor but insufficient. There is need to go beyond simple “Contraction and Convergence”
- Per capita emission is related to the level of development DIFFERENTLY for different categories of countries
- Can envisage Annex I country with 1 ton per capita CO2 emission by 2050, associated with $50,000 per capita income, because of its high technology, infrastructure, capacity
- However, a developing country with 1 ton per capita emission may be stuck with $500 or $1,000 per capita income, due to low technology and capacity -- unless it undergoes a fantastic technology revolution

Historical Responsibility and Per Capita Emission

- Annex 1 has advantage of past growth based on abundant use of carbon, leading to greater infrastructure, technology, human and social capacity
- Can turn economy and society around and achieve low-carbon or no-carbon economy and retain high GNP
- Dev. Countries no longer have the low-cost carbon resources to base its development
- Thus the use of a “multiplier” (denoting lower levels of technology, infrastructure, capacity) is required to adjust for per capita emission for developing countries in future discussion. For example if an average 1 ton per capita emission is a “sustainable” level agreed on, an adjustment factor should be included, so that developing countries have a multiple of 1 while developed countries go below 1 and including into negative territory.
- Note: Need to conceptualise and aim for negative per capita emissions in Annex1 countries to enable more carbon space and development space for developing countries

Guide to Action

- Great importance of transfer of finance, technology, capacity to developing countries through appropriate structures under UNFCCC, and in adequate volumes. This is key to a fair deal at Copenhagen and beyond.
- It is also key to enabling developing countries to contribute to developing a climate friendly world
- “Deep cuts” required in annex1 countries that should be envisaged in negative emissions. If they are unable to meet the deep negative emissions required, a compensation system should be devised, which is linked to the finance mechanism.

Guide to Action

- The “global goal” is part of overall package (political, environmental, economic, social, etc) with the equity, CDR and historical responsibility factors explicitly built in (carbon budgetting and fair shares to atmospheric space is part of this).
- The global goal of emission reduction is only a component of the overall global goal, and cannot be addressed in isolation. It is intrinsically linked to the various possible emission paths for Annex 1 and non Annex 1, to technology and finance requirements of developing countries and the commitments that must be made by Annex 1 on this, etc.
- All parts of the jigsaw have to be in place together.
- Translating the scientific facts of what needs to be done to a political deal incorporating all these elements, is the main challenge of Copenhagen and beyond. The science and the equity elements have to be addressed together.