

For information purposes, the Brazilian delegation submits attached an academic paper recently published on the "Brazilian Proposal".

The following paper is a chapter of the publication "BASIC experts, 2011. Equitable access to sustainable development: Contribution to the body of scientific knowledge. BASIC expert group: Beijing, Brasilia, Cape Town and Mumbai", which can be downloaded from www.erc.uct.ac.za/Basic_Experts_Paper.pdf.

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The importance of historical responsibility in the context of the international regime on climate change

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Causes of climate change are difficult to attribute, as observed warming is of the same magnitude as natural climate variability. Natural changes in climate result from interactions between the atmosphere and ocean, as well as from variations in the sun's energy output and in the amount of material injected into the upper atmosphere by explosive volcanic eruptions.

According to the 4th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC 4AR), warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.³

Climate change, as defined in the United Nations Framework Convention on Climate Change (UNFCCC), refers to a change of climate that is attributed directly or indirectly to human activity and altering the composition of the global atmosphere, in addition to natural climate variability observed over comparable time periods.

According to IPCC 4AR most of the observed increase in global average temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic greenhouse gas concentrations.⁴

Unlike ozone-depleting substances, greenhouse gas emissions don't need to be phased out. Stabilizing greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system would be sufficient, once a stable level has been scientifically defined. The stabilization of

1 Ministry of Science and Technology of Brazil.

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3 IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

4 IPCC, 2007, reference i.

concentrations requires that emissions eventually drop well below current (or 1990) levels.

According to UNFCCC, policies and measures on the mitigation of climate change will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the past decade to earlier levels of anthropogenic emissions of greenhouse gases would contribute to such modification with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of greenhouse gases. To some extent, this aim was replaced as well as postponed by the quantified emission limitation and reduction commitments of reducing 5% of their aggregate emission in 1990 by a five years period centered in 2010 contained in the Kyoto Protocol first commitment period (there is no expiration date for the Kyoto Protocol). However, as announced in Bangkok in October 2009 and confirmed in Barcelona in November 2009, some relevant developed countries have manifested a strong intention to abandon the Protocol. They apparently want to join the United States, and establish a new agreement, which would represent the substitution of the internationally legally binding regime that is Kyoto, to focus on national efforts in a new 'politically binding' agreement. In addition, if there is no second commitment period of the Kyoto Protocol, there will be no incentive for compliance with the Annex I commitments for the first commitment period. This represents a further delay of 10 years in combating climate change and further postponement of actions.

Moreover, when the pledges by individual developed countries in aggregate are compared to 1990 base year, the overall emission reductions range from 16 to 23%, according to the UNFCCC secretariat data distributed in 2009 at Barcelona (11 to 18% if the USA is included, according to an estimate of the Alliance of Small Island States). This is a very low level of ambition and well below the minimum level proposed by the IPCC for Annex I Parties (in the range from 25 to 40%). In addition, a substantial part of this pledge would be achieved by means of the use of mechanisms that would imply shifting the burden of solving global warming to developing countries.

In the case of urban atmospheric pollution or water contamination, emissions have been used as a measure of responsibility of the polluters. Such a procedure is appropriate as, when the residence time of the pollutant is relatively short, the concentration of the pollutant is proportional to the emission. Emissions levels give a good measure of the level of mitigation needed, as any effects are associated with the concentration of these (short-lived) pollutants. However, in the case of climate change, this notion cannot be applied due to the long-lived nature of greenhouse gases (long lifetimes in the atmosphere). Sharing the burden of mitigation climate change is the central issue in the UNFCCC process and these considerations highlight the problem of regarding current anthropogenic emissions of greenhouse gases as the central issue in the climate change debate. But historical emissions and the long-term consequences from this are equally crucial.

The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm to 379 ppm in 2005. There is no doubt that this increase is largely due to human activities, in particular fossil fuel combustion.

According to the IPCC, the primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use, with land-use change providing another significant but smaller contribution. Fossil carbon dioxide emissions are estimated to range from 72% to 92% of the global emissions of this gas in the 1990s. Carbon dioxide emissions associated with land-use change are estimated to range from 8% to 28% over the 1990s, although this estimate has a large uncertainty.⁵

According to IPCC 4AR, since 1970, greenhouse gas emissions from the energy supply sector have grown by over 145% while transport emissions grew by over 120% – by far the two sectors with the largest greenhouse gas emissions growth. Industry sector's emissions grew by close to 65%, LULUCF by 40% while the agriculture sector (27%) and residential/ commercial sector (26%) saw the slowest growth between 1970 and 2004.⁶

According to IEA's Key World Energy Statistics 2009, energy derived from fossil fuel usage accounted for approximately 81.4% of the world's energy output in 2007. It is estimated that CO₂ emissions will increase by 130% by 2050 in the absence of new policies or supply constraints. IEA also estimates that approximately 30% of CO₂ emissions are from coal fired power stations, however other industrial processes, such as natural gas stripping, steel making, cement production and alumina refining, account for close to 50% of CO₂ emissions.⁷ Energy will continue to come from existing fossil fuel based power stations and industrial facilities because of their long lifespans. Renewable energy technologies are fundamental to mitigate climate change, but alone they are not able to produce the required energy output by the world. This perpetuates the need to use fossil fuels over the next few decades. Therefore, fossil fuel-based energy will continue to be part of world energy matrix.

The scientific information presented above shows clearly that the focus to combat climate change must be reducing emissions from fossil fuel use.

Developed countries were responsible for 75% of CO₂ emissions from fossil fuel combustion in 1990 and OECD countries for 62% of these Annex I CO₂ emissions. It is also noted that per capita emissions in developing countries are still relatively low, owing to the industrialization process of developing countries that started in the middle of the twentieth century.

In 2004, per capita emissions in non-Annex I countries were four times lower than per capita emissions in Annex I countries (4.2 t CO_{2e}/cap in regards to the first one and

5 IPCC, 2007, reference i.

6 IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

7 <http://www.iea.org/statistics/>.

16.1 t CO_{2e}/cap regarding Annex I countries). In the same year, Annex I countries held a 20% share in world population against 80% share regarding non Annex I Countries.⁸

A method has been devised in the Bali Action Plan (adopted in December 2007 in Bali) to make a clear distinction of commitments of Annex I Parties and voluntary actions by non-Annex I Parties in accordance with the Principle of Common but Differentiated Responsibilities and further advance the implementation of the Climate Change Regime: paragraph 1b(i) for developed countries that are not Parties to the Kyoto Protocol (the United States of America is the only Party remaining with this status) in order to make comparable efforts to those Parties of the Protocol and paragraph 1b(ii) for developing countries in order to take nationally appropriate mitigation actions (NAMAs) enabled and supported by financing, technology and capacity building from developed countries. Both actions and support must be measurable, reportable and verifiable (MRV).⁹

An ethically relevant criterion for allocating responsibility to reduce the threat of climate change has been addressed in terms of the polluter pays principle and past contributions to climate change.

Developed countries argue that greenhouse gas emissions from fast developing key countries will equal the emissions from developed countries at some point in time between 2020 and 2030, according to IPCC scenarios. It is relevant to register that the UNFCCC notes that the share of global emissions originating in developing countries will grow to meet their social and development needs.

But the largest share of historical and current global emissions of greenhouse gases has originated in developed countries. According to WRI CAIT, Annex I countries held a 75% share in cumulative CO₂ emission (1850-2005) against 25% share regarding non-Annex I Countries for the same period.¹⁰

There is an impasse where developed countries look only at the future while forgetting past emissions, and developing countries look to the past and are concerned with their own future emissions. These concerns expressed by developing countries are linked to 'grandfathering' of greenhouse gas emissions of developed countries.

Considering the atmosphere, early action would reduce emissions or enhance sinks, decreasing future levels of greenhouse gas concentrations and contributing to mitigation of climate change. But the decision to use emissions as a basis for the climate change Convention is not contributing to solving the global warming problem from an atmospheric perspective.

The first approximation showed that the dependence of atmospheric concentrations on emissions over a given period of time is proportional to the accumulation of the emissions up to the year in question. It is necessary to take into account that the older the emission the smaller is its effect on concentration due to the exponential natural decay of greenhouse gases in the atmosphere, with a different lifetime for each gas. The

8 IPCC, 2007, reference iv.

9 Copenhagen: Key Issues Facing Developing Countries, Martin Khor mkhor@igc.org.

10 http://unfccc.int/files/meetings/ad_hoc_working_groups/lca/application/pdf/6_china.pdf.

physics of radiative forcing indicates that the rate of deposition of energy on the surface (i.e. the warming itself) is proportional to the concentration of the greenhouse gases.

The increase in global mean surface temperature is roughly proportional to the accumulation over time of the radiative warming, which is in turn proportional to the atmospheric concentration of the greenhouse gases. It follows that the temperature increase itself is proportional to the accumulation of the atmospheric concentration of the greenhouse gases.

In order to contribute for solving the global warming problem from an atmospheric perspective, in 1997, Brazil has proposed¹¹ addressing the central question of the relationship between net anthropogenic emissions of greenhouse gases by Parties over a period of time and the effects of such emissions in terms of climate change, measured by the increase in global mean surface temperature.

The Kyoto Protocol uses emissions as a basis under which industrialized countries will reduce combined greenhouse gas emissions by at least 5% compared to 1990 levels by the period 2008–2012. This legally binding commitment promised to produce a historic reversal of the upward trend in emissions that commenced in these countries some 150 years ago.¹²

The outcome of the Kyoto Protocol (Annex B) established a different level of commitment for each country concerning quantified emission limitation or reduction (as a percentage of base year or period).

No attempt was made to establish objective criteria on how to mitigate climate change (by how much and for how long). Moreover, no explicit quantification has been made, through the Berlin Mandate process and discussions in Kyoto, of the effect that the overall greenhouse gas emission reduction would symbolize in terms of decreasing the rate of temperature increase. Actually, the emission reduction or limitation targets set at Kyoto will result in continued increase in the global mean surface temperature during the whole period of the Kyoto Protocol until 2012. Amazingly, the emission reduction effort does not reduce global warming caused by Annex I Parties, which is often misunderstood by the general public. It can be very easily demonstrated that the outcome of the Kyoto Protocol, emission reductions for all Annex I countries of 5 per cent on average in the period of five years centered around 2010 as compared to 1990 levels, represents an additional enhancement of the greenhouse effect as compared to the previous (and not legally binding) commitment of developed countries to stabilize their overall greenhouse gas emissions at 1990 levels by 2000, and maintain these levels until 2010.

Despite the facts given above, at present the Kyoto Protocol is the only legal instrument that is delivering real emission reductions from Annex I Parties and the task now is to build on this success by setting up the next steps for Annex I Parties, more ambitious quantified emission reduction commitments for the 2nd and subsequent

11. FCCC/AGBM/1997/Misc.1/Add.3 Proposed Elements of a Protocol to the United Nations Framework Convention on Climate Change, Presented by Brazil in response to the Berlin Mandate.

12. The Kyoto Protocol, UNFCCC, Introduction.

Commitment Periods. But the limitation and reduction commitments currently adopted and discussed are not related to future mean surface temperature increase.

The Convention on Climate Change is based upon two 'soft law' (or *jus cogens*) principles that countries adopt whereby political and moral commitments will be respected in good faith.¹³

Firstly, the precautionary principle which states that 'The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.'

Secondly, the most important principle is that of common but differentiated responsibilities. Paragraph 1 of Article 3 of the UNFCCC states that 'The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.' The preamble of the UNFCCC acknowledges that 'change in the Earth's climate and its adverse effects are a common concern of humankind' and that 'the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions'.¹⁴ It is also noted that 'the largest share of historical and current global emissions of greenhouse gases 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'.¹⁵

The responsibility for emissions is common, as the greenhouse gases are completely mixed in the atmosphere within approximately two weeks, leaving it impossible to attribute emissions directly to individual countries from which they originated. The large variety of greenhouse gases and infinite sources also leaves a question mark as to where the gases originated. Most importantly, the adverse effects of climate change are a common concern to humankind, making it difficult for any one country to act by itself to mitigate climate change if the rest of the world is not concerned with the problem. Some countries would have to accept a greater responsibility for global warming than others.

13. Direitos Humanos e Cultura: a Contribuição da Unesco nos anos 90, Candeas, Alessandro W. and Candeas, Ana Paula L.S., in Boletim da Sociedade Brasileira de Direito Internacional, Ano LI no. 113/118.

14. Climate Change Convention, Preamble, first and sixth paragraphs.

15. Climate Change Convention, Preamble, third paragraph.

UNFCCC Annex I illustrates that developed countries have committed to take the lead in combating climate change: only developed countries have assumed the commitment in the Convention of limiting their anthropogenic emissions of greenhouse gases with the aim of returning individually or jointly to 1990 levels of such emissions. These countries recognized that, by returning to earlier levels by the end of the decade, they would have made a significant contribution to modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention.

But for Annex I Parties that are not economies in transition (non-EIT Parties), total aggregate emissions excluding LULUCF increased from 1990 to 2008 by 7.9% and emissions including LULUCF increased by 8.3%.¹⁶

The differentiation between developed and developing countries is not apparent, due to a vague definition and criteria for distinction. The Convention lists the developed countries in Annex I, comprising OECD and industrialized countries of Eastern Europe and the Former Soviet Union. This simple selection criterion led to uncertainties for countries such as Turkey, which was an OECD member, although its development level was still lagging behind most OECD countries. Including new developing countries as OECD members, such as the Republic of Korea and Mexico, deepens the difficulties of establishing objective differentiation criteria. They are not listed in Annex I and are not willing to accept the burden of developed country commitments,

This policy framework generates a new North–South antagonism as developing countries argue that industrialized countries are responsible for causing the change in climate. This is recognized in the preamble of the Convention where it is noted that ‘the largest share of historical and current global emissions of greenhouse gases has originated in developed countries’. The industrialization process, commencing for some developed countries during the industrial revolution, resulted in a large amount of carbon emissions from fossil fuel combustion (mainly from coal) during the end of the eighteenth century and the beginning of the nineteenth.

There is an understanding that historic responsibilities has already been addressed by dividing Parties to the UNFCCC into Annex I and non-Annex I countries while ascribing the quantified emission reduction commitments to the former under the Kyoto Protocol. But Annex I countries have been avoiding their historic responsibility partly by difficulties in meeting their agreed commitments (as registered above) through domestic actions combined with the use of Kyoto Protocol mechanisms in order to meet their commitments. In addition, recently new attempts have been made by developed countries to considered ‘emergent’ developing countries as developed countries, despite substantial social and economic indicators of differences among these developing countries and the developed countries.

The main focus of the discussion was increasingly an attempt to involve developing countries in sharing the burden of mitigating climate change. This is related to competitive problems in the economies of developed countries and the perception that

16. FCCC/SBI/2010/18.

the principle of common but differentiated responsibilities will further give advantage to the most advanced developing countries.

Discussions so far have been based on misleading assumptions, as it has been repeatedly reaffirmed that developing countries would account for the same amount of greenhouse gas emissions as developed countries between 2020 and 2030, based on IPCC scenario IS92a. The US Senate Resolution states that: 'greenhouse gas emissions of Developing Country Parties are rapidly increasing and are expected to surpass emissions of the United States and other OECD countries as early as 2015'. A USAID document on Climate Change¹⁷ also states that 'Developed nations currently contribute approximately 73 per cent of anthropogenic emissions of carbon dioxide ... Despite the current disparity, the growth in emissions from developing nations is accelerating. The current rate of increase in carbon dioxide emissions from developing nations is approximately 6 per cent per year. If current growth trends continue, developing nations will account for half of annual greenhouse gas emissions by 2035.'

The future greenhouse gas emissions are only an estimate, therefore embodying all the uncertainties related to forecasting. A problem with this kind of emission forecasting is that it is based upon annual emissions, for which results do not correspond directly to responsibility for causing climate change. Responsibility has to be associated with the effect of emissions in terms of global warming.

The responsibility of both groups of countries (Annex I/non-Annex I) in terms of temperature increase, under the Convention, has never been estimated up to 1997. This is a natural consequence of the focus on annual emissions in the negotiations. Having neglected this issue in the IPCC assessments of climate change literature, the differentiated responsibility has been overlooked in IPCC documents so far. Moreover, because of the long-time residence of greenhouse gas in the atmosphere, the emissions of developed countries since the Industrial Revolution caused the vast majority of the problem: according to the Bern Model, around 20% of CO₂ emissions stays in the atmosphere for more than 800 years and about 10% stays for a very long timespan (for practical purposes considered to be 200,000 years due to the impossibility to estimate this lifetime).

The base year was established at 1990 for all Annex I countries under the Convention as a way to establish a baseline for a country's responsibility. Prior to 1990, nations were not aware of the existing problem and could not be blamed for their lack of knowledge. Under this rationale, countries are responsible for their role in greenhouse gas emissions only after 1990. This argument was aligned with the political interests of developed countries, which involved forgetting historical emissions and leveling the playing field ('grandfathering') in relation to newly industrializing countries (with high emissions in 1990) to maintain commercial competitiveness. Grandfathering implies that future generations will have to pay to enjoy a clean environment.¹⁸ It is often ignored that new industrialized countries only started their industrialization processes in a robust pathway 40 or 50 years ago, that the increase in temperature is a

17. Climate Change Initiative 1998–2002, USAID, page 12.

18. Discounting and sustainability in applied IAMs, Gerlagh, R. IVM, The Netherlands.

double accumulation process, and that they have not contributed to current global warming. However, the Convention has provisions that can ensure that these arguments are flawed, especially in Article 4.2 (a) and preambular paragraph (18th paragraph) 'recognizing also the need for developed countries to take immediate action in a flexible manner ... that take into account all greenhouse gases, with due consideration of their relative contributions to the enhancement of the greenhouse effect'.

The first problem faced in linking the causes (emissions) and effects (global warming) was the establishment of an objective criterion to measure climate change. It is therefore of central importance to establish a relationship between the net anthropogenic emissions and the resulting change of climate. Although it is anticipated that the change of climate would have a complex geographical distribution, it is important to have one unique measurement of global climate change.¹⁹ The evident variable to measure climate change is the change in global mean surface temperature.

This criterion is closely connected to the physical reality of global warming, a property not applicable to absolute emissions, which are an instantaneous 'snapshot' of a situation in an arbitrary calendar year. Global mean surface temperature can be used as an indicator of global warming, and the designation of specific country responsibilities can be stated in terms of its individual contribution relative to total global mean surface temperature increase. This individual contribution temperature increase will take into consideration differences among countries in terms of starting points, approaches, economic structures, resource bases, the need to maintain sustainable economic growth, available technologies and other individual circumstances, as stated in Article 4.2(a) of the Climate Change Convention. The change in temperature is an objective measure of climate change, for it can be argued that the detrimental effects of climate change are somewhat proportional to it.

For example, there is a margin of uncertainty in climate sensitivity (the change of temperature resulting from a doubling of the carbon dioxide concentration is known to be likely within the range of 1.5 to 4.5°C). As these uncertainties are progressively reduced, improvements in the models can be achieved by updating the calibration constants of proportionality. This in turn will improve the accuracy of the absolute results resulting from the incorporation of available scientific knowledge without prejudice to relative contribution adjustment.²⁰

Consistent with the position it has presented over the years, the Brazilian Government recently submitted its views to the UNFCCC on Shared vision for Long-Term Cooperative Action: the long-term global goal should be ambitious, based on the best science and updated accordingly. This updating should reflect progress in our knowledge of the potential effects generated by different levels of global temperature increase. The long-term global goal should be defined in terms of global temperature increase. Initially, this goal could be set at 2°C and updated according to progress in

19. Proposed Elements of a Protocol to the UNFCCC, presented by Brazil in response to the Berlin Mandate, submission dated 28 May 1997, FCCC/AGBM/1997/Misc.1/Add.3.

20. Brazilian Proposal, reference xvi.

scientific knowledge. To allow for this updating, the 2°C goal would be broken down into partial targets: initially, 0.2°C temperature increase per decade over ten decades. Every ten years, the partial target would be evaluated, with a view to possible redefinition, taking into account advances in scientific knowledge and the reduction of uncertainties. It is important not to attribute to science definitions which are not scientific, such as the identification of a specific global emission pathway as the sole pathway that can maintain global temperature increase below a certain level. Avoiding misleading definitions will be important to ensure that we advance towards what is needed: an ambitious long-term goal to control global warming.²¹

The Conference of the Parties, during its 16th Session convened in Cancun in the end of 2010, through Decision1/CP.16, recognized that deep cuts in global greenhouse gas emissions are required according to science, and as documented in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, with a view to reducing global greenhouse gas emissions so as to hold the increase in global average temperature below 2°C above preindustrial levels, and that Parties should take urgent action to meet this long-term goal, consistent with science and on the basis of equity. It also recognized the need to consider, in the context of the first review, strengthening the long-term global goal on the basis of the best available scientific knowledge, including in relation to a global average temperature rise of 1.5°C.

The use of global mean surface temperature as a proxy for global warming permits the formulation of a model to analyze the responsibility of individual countries. The Cancun Agreements give the opportunity to restart the consideration of global mean surface temperature as a proxy for global warming as Parties decided to hold the increase in global average temperature below 2°C above preindustrial levels as the long-term goal, consistent with science and on the basis of equity. The core of the model relates to a double accumulation process representing the essence of global warming. Accumulated emission increases concentrations and, for each annual level of greenhouse gas, the accumulation of radiative forcing increases (global mean surface) temperature.²²

The current concentration of greenhouse gases in the atmosphere is a result of past emissions, since the industrial revolution (post-1750 period). Current generations are bearing the burden of past interference with the climate system, resulting from irresponsible human activities during the last two centuries, primarily in developed countries. In a similar manner, current human activities around the world will impact the future climate during the next two centuries. Any attempt to limit the global concentration level of greenhouse gases in the atmosphere will create concrete obstacles to the development of developing countries and are therefore completely unacceptable. This would increase the cost for economic growth, which would be unfair, taking into account that the current developed countries had no limitation during their

21. FCCC/AWGLCA/2009/MISC.4 (Part I).

22. Notes on the time-dependent relationship between emissions of greenhouse gases and climate change, Meira Filho, L.G. and Miguez, J.D.G., in press.

growth path in the past and now try to create an upper bound for the emissions of developing countries in the next few years.

Reconstructing the series of anthropogenic greenhouse gas emissions by sources and removals by sinks in all sectors allows the estimation of the relative share of total temperature increase attributable to an individual country. Hence, the estimation of the relative responsibility of a given country for causing global warming can be made regardless of the current uncertainty over the absolute temperature increase attributable to the greenhouse effect alone.

An example of this method was used in the Brazilian Proposal in 1997 and reproduced by WRI/CAIT (probably using a different methodology from the Brazilian Proposal) using updated information covering the period 1850 to 2005.

Table 1

<i>Contributions to temperature Increase</i>		
	<i>1850/2005</i>	<i>1850/1990</i>
	<i>CO₂ (energy)</i>	<i>CO₂ (energy+cement)</i>
<i>Country</i>	<i>WRI/CAIT</i> %	<i>Brazilian proposal</i> %
China	8.39	3.05
India	2.22	0.90
South Africa	1.10	0.21
Brazil	0.80	0.32
BASIC	12.51	4.48
Non Annex I	26.48	10.35
Annex I	73.52	89.65

This proposal provides a means to measure objectively the relative responsibility of each Party or each group of Parties in bringing about climate change. The Convention encompasses the all-important principle of a common but differentiated responsibility, and provides an objective criterion for the differentiation of responsibilities. Furthermore, it provides a means of quantifying the relative responsibility of developed countries in relation to developing countries based on their contribution to the atmospheric concentrations of greenhouse gases at the time of negotiation.²³

Another important conclusion drawn from the Brazilian Proposal was that in 1990 emissions from developing countries (non-Annex I) correspond to 25% of global anthropogenic greenhouse gas emissions, whereas the non-Annex I relative share of the temperature increase in the same year corresponds to only 12% of global (mean

23. The estimation of initial concentrations for each individual country in 1990 can take into account the differences in starting points of each individual Party as stated in Article 4.2(a) of the Climate Convention.

surface) temperature increase. Both conclusions demystify the debate about the year in which Annex I and non-Annex I emissions will be equal. However, in this hypothetical year a large share of responsibility for causing global warming will still be attributable to Annex I countries.

This context requires building an effective international climate change regime with a strong Kyoto Protocol, with ambitious targets for Annex I countries as the pillar for this effort, as well as a strong outcome of the international negotiation to enhance the full, effective and sustained implementation of the Convention. In order to achieve this aim, quantifying the relative responsibility of developed countries in relation to developing countries based on their contribution to the increase in global mean surface temperature must be part of the equation.

Equitable access to sustainable development

Contribution to the body of scientific knowledge

A paper by experts from BASIC countries

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