

# CSE dossier



## factsheet 5

### DEFINITIONS OF 'EQUAL ENTITLEMENTS'

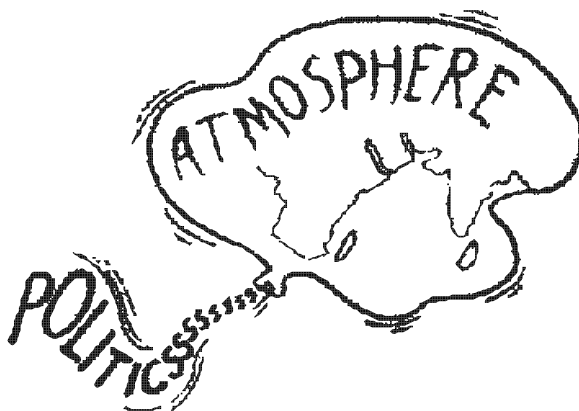
FOURTH  
SESSION  
OF  
THE  
CONFERENCE  
OF  
THE  
PARTIES  
TO  
THE  
UNITED  
NATIONS  
FRAMEWORK  
CONVENTION  
ON  
CLIMATE  
CHANGE

**BUENOS AIRES,  
NOVEMBER 2-13, 1998**



#### **Centre for Science and Environment**

41, Tughlakabad Institutional Area,  
New Delhi-110062 India  
Tel: 91-11-6986399, 6983394  
Fax: 91-11-6985879  
E-mail: [cse@sdalt.ernet.in](mailto:cse@sdalt.ernet.in)  
Website: [www.cseindia.org](http://www.cseindia.org)



The atmosphere is a global common property and environmental space that is shared and used by all human beings for their survival and economic growth. Apart from the fact that it is vital for life on Earth, it is also a major dumping place for pollutants produced by human activities from agriculture, industry and transport. Various ecological processes, especially those in operation in the oceans, play an important role in absorbing the carbon dioxide that is produced by human activity and thus help to keep the atmosphere clean. But today human beings are producing so much carbon dioxide that these ecological processes cannot clean up all the carbon dioxide being generated by them. As a result,

carbon dioxide is accumulating in the atmosphere. Whereas carbon dioxide concentration in the atmosphere just before the Industrial Revolution (1750-1800) was about 280 ppm (parts per million), it had reached 353 ppm by 1990. Scientists believe that we should not allow this atmospheric concentration to go beyond 450 ppm otherwise there will be serious ecological and economic damage. Even then the average world temperature will be between 0.5-1.2°C hotter in 2100 as compared to 1990<sup>1</sup>.

Reducing carbon dioxide emissions from human activities has high costs and, therefore, tackling the problem of 'global warming' means that major expenditure will have to be incurred

by nations in dealing with the problem. In such a situation, the burden of change must be shared equitably. People of those nations who have contributed little to the problem should have the right to grow economically without having to bear the expenditure for making the necessary technological transformation whereas those nations which have already contributed high amounts of emissions to the atmosphere should bear most of the cost.

Table 1  
Size of carbon dioxide sinks

Type of sink	Amount absorbed every year
Oceanic Sinks	2.0 billion tonnes of carbon
Sinks provided by Northern Hemisphere forests	0.5 billion tonnes of carbon
Other terrestrial sinks (Carbon dioxide fertilisation, nitrogen fertilisation, climatic effects, etc)	1.3 billion tonnes of carbon
<b>Total sinks</b>	<b>3.8 billion tonnes of carbon</b>

Source: IPCC 1996, *Climate Change 1995: The Science of Climate, Contribution of Working Group I to the Second Assessment Report of the IPCC*, Cambridge University Press, Cambridge, p.79.

The best way to distribute the benefits of the global atmosphere is to distribute them in an equitable manner. These 'equitable benefits' would then become the 'entitlements' of human beings which they would have to live within.

There are two basic approaches to define these entitlements:

- a) One approach could be to build a system of entitlements that is based on current and future emissions.
- b) Another approach could be to include historical emissions (that is, emissions since the start of the Industrial Revolution or from 1950 when the post-War economic boom began).

We give below different ways in which each of these approaches can be or have been used to define 'equitable entitlements':

**PROPOSALS FOR EQUITABLE EMISSIONS ENTITLEMENTS BUILT ON CURRENT AND FUTURE EMISSIONS**

There are three different ways in which emissions entitlements built on current and future emissions can be developed:

1. By sharing the world's common sinks (that is, processes that absorb the carbon dioxide and other gases that cause global warming) equitably.
2. By sharing the world's future emissions budget equitably.

3. By establishing a per capita emissions entitlements which all countries will agree to converge on.

We describe below in some detail each of these ways.

**Sharing the world's common sinks equitably**

In order to avoid global warming, the world will have to learn not to produce more emissions than the world's sinks (that is, processes that absorb the carbon dioxide and other gases that cause global warming). The Intergovernmental Panel on Climate Change (IPCC) has pointed out that emissions of carbon dioxide must come down by over 60 per cent immediately if its concentrations are to get stabilised at today's levels.

The average annual production of carbon dioxide between 1980 and 1989 has been estimated at 7.1 billion tonnes of carbon equivalent. The average annual absorption by all the sinks for these years was 3.8 billion tonnes of carbon. There are mainly two types of sinks for carbon dioxide, namely, sinks that are based in the oceans and sinks that are based on land.

Nations could well argue that terrestrial sinks are their national property and not global property as the world's lands are all divided up into different national territories. But as oceans belong to all humankind, it can be legitimately argued that oceanic sinks are the common heritage of humankind. The oceanic sinks are of the order of 2 billion tonnes of carbon per year. As the 1990 world population was 5.3 billion, this gives us a per capita sink availability of 0.38 tonnes of carbon (0.38tC) which can be considered each person's entitlement. India's carbon dioxide emissions in 1990 from burning of fossil fuels, gas flaring and cement production was only 0.22tC. In other words, India will then be entitled to increase its emissions up to 0.38tC and in the meantime trade the emissions that it is entitled to but is not using or even consider 'banking' these unused emissions for future use.

However, this entitlement is so low that not only will India reach the limit very fast, but there are many developing countries which are already emitting more carbon dioxide. While major developing countries which were emitting less than their entitlement in 1990 included all the seven countries of South Asia, namely, Nepal, Bhutan, Bangladesh, Sri Lanka, the Maldives, Pakistan and India, African countries like Tanzania, Ghana, Kenya and Nigeria, Asian countries like the Philippines and Indonesia, and South American countries like Peru and Brazil, there are other major developing countries like Egypt and China which have already crossed this level of per capita emissions.

A very simple approach would be for nations to agree on an ad hoc per capita entitlement to which all countries will agree to converge

**Sharing the world’s emissions budget equitably**

A second concept of entitlements emerges out of the concept of ‘contraction and convergence’ promoted by the Global Commons Institute in London and endorsed by Global Legislators Organisation for a Balanced Environment (GLOBE). Under this concept, the world needs to agree on the upper limit of atmospheric concentration of carbon dioxide that would be considered acceptable and by which year this concentration can be reached. These decisions would then determine the total amount of carbon dioxide — the global budget — which can be emitted by all nations on Earth.

This entire budget can be distributed equitably to all people on Earth which would then provide each country with its total budget. This national budget can then be distributed over the entire period during which the agreed atmospheric concentration is expected to be reached. If during a particular year, a country does not use its budget, then it could have the right to trade its unused budget.

The IPCC has estimated the total amount of carbon dioxide emissions that can be emitted in a 110 year period from 1991 to 2100 to reach specified atmospheric concentrations. (Table 2)

If we were to aim for an atmospheric concentration of 450 ppm of carbon dioxide, then the world can emit an average of 5.73 to 5.91 billion tonnes of carbon every year which would have provided in 1990 a per capita entitlement of 1.08 tonnes of Carbon to 1.12 tC (or 1.1tC).

**Establishing an ad hoc per capita emissions entitlement which all countries will agree to converge on**

A very simple approach would be for nations to agree on an ad hoc per capita entitlement to which all countries will agree to converge. This entitlement could be anything like 0.5tC, 1.0tC or 1.5tC. The higher the entitlement, the better it would be for both developing countries and for industrialised countries because then developing countries can go up to higher per capita emissions whereas industrialised nations do not have to go down to levels that look impossible to them.

The problem with high entitlements, however, would be that atmospheric concentrations could reach a point that would lead to serious heating up of the Earth.

Therefore, a provision will have to be made in the rules that the ad hoc entitlement can be changed downwards or upwards depending on the increasing scientific evidence of the build-

up of carbon dioxide concentrations in the atmosphere and on its climatic effects. In fact, a key principle of the Framework Convention on Climate Change is that it will consistently take into account the latest scientific information in its decisions. In other words, if scientific information is negative, all nations will accept more stringent measures and if the scientific information is positive, they can relax.

In any case, the purpose of entitlements is not to force every nation to come down to the same level of per capita carbon dioxide emissions, which industrialised countries like the US, will probably find impossible to reach as long as they remain locked into a fossil fuel energy economy but to create an equitable framework in which all nations can work together with the assurance that each person is entitled to equity in economic activities and there is sufficient scope for cooperation between the rich and poor countries so that both can move towards a carbon-free energy economy. Because once nations have made the transition from a carbon-based energy economy to one that is carbon-free (based on solar energy and hydroelectricity, for instance), then they will have no constraints on their energy consumption.

Therefore, the key purpose of the ‘entitlements’ concept is not merely to ensure equity but equally to create a framework that helps all countries move towards a carbon-free energy economy as fast as possible. In order to meet this objective, any trade in emissions that is built on this entitlement should be pegged not to least cost options but to those options that promote the use of non-carbon energy sources. (For details on the importance of moving towards a transition towards solar energy, please see Factsheet 6)

The key purpose of the entitlements concept is not merely to ensure equity but equally to create a framework that helps all countries move towards a carbon-free energy economy

Table 2  
**Carbon dioxide emissions budgets for different atmospheric concentrations**

<b>Atmospheric concentration of carbon dioxide (ppmv)</b>	<b>Emissions Budget over the period 1991-2100 (billion tonnes of carbon)</b>	<b>Average annual budget over the period 1991-2100 (billion tonnes of carbon)</b>
350	300-430	2.73-3.91
450	630-650	5.73-5.91
550	870-890	7.91-8.09
650	1030-1190	10.27-10.82
750	1200-1300	10.91-11.82

Source: IPCC 1995, *Climate Change 1994: Radiative Forcing of Climate Change and an Evaluation of the IPCC IS 92 Emissions Scenarios*, Cambridge University Press, Cambridge, p.22

**But one can ask isn't this an ad hoc approach? Why promote adhocism?**

On the contrary, there is already a lot of pragmatic adhocism in the climate change negotiations. For instance, the amounts that industrialised countries are going to emit by 2008-2010, as specified in the Kyoto Protocol are all pegged to their emissions in the year 1990. The choice of the year 1990 is as ad hoc as anything can be.

Table 3

**Sharing the carbon dioxide budget including historical emissions for a 400 ppm carbon dioxide atmospheric concentration and 300 billion tonnes of carbon budget between 1986 to 2100**

	World emissions (btC)	ICs emissions (btC)	DCs emissions (btC)	Years left @ 1986 release rate		
				ICs	DCs	World
<b>ACTUAL EMISSION</b>						
1950	1.55	1.44	0.11			
Share (%)		0.93	0.07			
1986	5.27	3.90	1.37			
<b>Share (%)</b>		<b>0.74</b>	<b>0.26</b>			
1950-1986	127.9	104.4	23.5			
<b>Share (%)</b>		<b>0.82</b>	<b>0.18</b>			
<b>SHARED BUDGET</b>						
1986-2100	300	48	252	12	183	57
<b>Share (%)</b>		<b>0.16</b>	<b>0.84</b>			
1950-2100	428	77	351	Nil	255	81
<b>Share (%)</b>		<b>0.18</b>	<b>0.82</b>			

Note: ICs = Industrialised countries; DCs = Developing countries.

Source: Florentin Krause et al 1989, *Energy Policy in the Greenhouse, International Project for Sustainable Energy Paths*, Cerrito, p. I.5-15

But it has been accepted as the baseline year because industrialised countries had to show that they were reducing their emissions relative to some year and as long as they started moving ahead, it did not matter which year was chosen. In fact, countries in economic transition have been given the option to choose their own baseline year. And the amount by which each industrialised country is going to reduce its emissions relative to 1990 emissions has also been ad hoc. Again, all this was done in the interest of simply moving ahead. Similarly, an ad hoc entitlement amount can be chosen in order to get the principle of equity and convergence enshrined in the Framework Convention on Climate Change and get North-South cooperation moving through emissions trading.

**How will we deal with 'hot air' if we allow trade in the entire entitled amount?**

Hot air is another issue of concern because if high entitlements are fixed for all people and if countries, especially those countries, which are unlikely to use

up their emissions entitlements in the early years, are allowed to trade their entire unused amounts, this would be equivalent to trading 'hot air', in other words, trading emissions that a country was not going to produce in a particular year. Therefore, whereas all people would have the right to increase their emissions to their entitled amounts, they would have to be restrictions on their right to trade those emissions. Maybe they could be allowed to trade savings in only those emissions that they would have produced had they not undertaken measures to improve their energy efficiency and move towards non-carbon energy sources.

**How will we deal with the problem posed by population growth?**

Any system of per capita entitlement can be argued to be unjust to those nations that have stable populations as compared to those which have rapidly growing populations.

With increasing population, nations will be entitled to emit more and more over the years under a per capita entitlements scheme. This provides a perverse incentive to them to increase their population. This problem can, however, be dealt with by freezing the global distribution of population with reference to an agreed year, which would ideally be the year of the agreement. In this way, no nation can increase its total emissions entitlement. If its population grows, then its per capita emissions will steadily go down. This will then act as an incentive to reduce population growth.

**PROPOSALS FOR EMISSIONS ENTITLEMENTS THAT INCLUDE HISTORICAL EMISSIONS**

We give below two proposals that have been made for equal entitlements that take into account historical emissions.

**International Project on Sustainable Energy Paths**

A study prepared for the Dutch government by the *International Project for Sustainable Energy Paths* in 1989 argued that the average rate of global warming should be limited, as closely as possible, to 0.1°C per decade and, as an outer limit, to an increase of 2°C by 2100 over the present. In that case, the Earth's temperature would remain within the range that human beings have seen in the period since their evolution two million years ago. This would also restrict the sea level rise to a moderate, and may be manageable, level of about 1 metre whereas a rise of 5-7 m would be absolutely disastrous. This means that the maximum allowable concentration of all greenhouse gases (carbon dioxide, methane, nitrous

By freezing population levels at a particular year no nation can increase its entitlements by increasing its population

oxide, CFCs etc.) should not exceed 430-450 parts per million (ppm) of carbon dioxide equivalent during the next century, provided these levels decline thereafter. In other words, concentration of carbon dioxide itself should not exceed 380 ppm (compared to 338 in 1980 and 349 in 1985) while other greenhouse gases together add up to another 50 ppm of carbon dioxide equivalent. IPSEP's calculations show that this means that only a total of 300 billion tonnes of carbon (btC) can be released between 1985 and 2100 or roughly 2.6 btC each year.

IPSEP then asked the question: How should this 300 btC global carbon emissions budget (over the period 1986-2100) ought to be shared?

IPSEP pointed out that this budget should be shared on the basis of human population over the period 1986-2100 (that is, in terms of person-years). Its calculations showed that if the existing and projected populations of industrialised and developing countries between 1986 and 2100 were taken into account, then developed countries would exhaust their entire carbon release quota of 48 btC till 2100 by 1999, that is, if they continue to release carbon dioxide at their 1986 levels. Developing countries, on the other hand, will be able to emit carbon dioxide at their 1986 rate until 2169 AD.

The IPSEP study further pointed out that developed and developing countries have been emitting carbon dioxide at vastly different rates for a long time. If this historical inequity is taken into account, and the permissible global carbon emissions budget of 428 btC from 1950 till 2000 is distributed between industrialised and developing countries, instead of the 300 btC global carbon emissions budget between 1986 and 2100, then developing countries can continue to emit carbon dioxide at their 1986 rate till 2241 AD. But industrialised countries had already exhausted their entire quota by 1986. In other words, they would have to stop all carbon dioxide emissions right away<sup>2</sup>. (Table 3)

It is obvious that sharing the carbon budget which takes historical emissions into account provides industrialised countries with so little space for change that, in fact, it provides no space for change. Therefore, it is extremely unlikely that industrialised countries will accept any such proposal. But if developing countries do not insist on historical emissions being taken into account in order to calculate equitable entitlements, then industrialised countries must appreciate the fact that this is a gracious gesture on the part of developing countries.

### The Brazilian Proposal

A few months before the Kyoto Conference of

Parties, the Brazilian government tabled a proposal for sharing the emissions reduction burden. The proposal said that by the year 2000, countries are expected to bring their emissions back to the 1990 level. The 1990 level was termed the 'effective emissions reference'. By 2020, the Annex 1 countries (that is, industrialised countries) should aim to reduce their emissions to 30 per cent lower than the 1990 level as a group. This level was called the 'effective emissions ceiling'. The proposal further argued that 'effective emissions reduction targets' be established for each of the periods 2001-2005, 2006-2010, 2011-2015 and 2016-2020 for the entire Annex 1 countries<sup>3</sup>.

According to the proposal, all these numbers are not calculated in terms of 'annual emissions' as all other proposals do, but in terms of the average global surface temperature (in degrees Centigrade) because emissions can be correlated with temperature changes in the atmosphere. And as it is global warming that the world is trying to avoid, it is better that all numbers are presented in terms of temperature differences that actions of individual nations will make.

But once the 'effective emissions reduction target' has been fixed for the Annex 1 countries as a group, the Brazilian proposal goes on to argue that the relative responsibilities and targets for different nations be fixed in terms of their relative share of induced temperature increase in 1990 because of

It historical emissions are taken into account the North would have to stop emissions right away but the South can carry on business as usual

Table 4  
Differentiated responsibility for climate change attributable to each group

Relative Shares	Annex 1 nations (%)	Non-Annex 1 nations (%)
Relative share of annual carbon dioxide emissions in 1990	75	25
Relative share of carbon dioxide concentrations in the atmosphere in 1990	79	21
Relative share of induced temperature increase due to carbon dioxide emissions in 1990	88	12
Relative share of induced temperature increase due to carbon dioxide emissions in 2010	82	18
Relative share of induced temperature increase due to carbon dioxide emissions in 2020	79	21

Source: UNFCCC 1997, *Implementation of the Berlin Mandate, Additional Proposals from Parties. Addendum*. Note by the Secretariate to the Ad Hoc Group on the Berlin Mandate, Seventh Session, Bonn, 31 July-7 August 1997, Item 3 of the Provisional Agenda, FCCC/AGBM/1997/MISC, 1/Add. 3, p.20-21.

greenhouse gas emissions. As a country's historical emissions are also contributing to the increase in temperature induced by 1990, countries' with larger emissions in the past will have to accept a larger 'effective emissions reduction target' than others. For example, the proposal pointed out that in 1990, whereas Annex 1 countries were responsible for only 75 per cent of the total carbon dioxide emissions in that year, they were responsible for 88 per cent of the induced temperature increase due to carbon dioxide in 1990. In this context, the Brazilian proposal pointed out that though the Intergovernmental Panel on Climate Change has said that annual emissions of developing and developed countries would equal in 2037, the induced changes in temperature by developing and developed countries will equal in 2147. (Table 4)

The Brazilian proposal has also argued for a strict compliance regime. It argued that countries which do not meet their commitments would have to provide a contribution to the Clean Development Fund (CDF) calculated at the rate of US\$3.33 per effective emissions unit that was emitted higher than the ceiling decided. The fund would be used to finance climate change mitigation and adaptation projects in developing countries<sup>3</sup>.

The Bonn meeting of the Subsidiary Body for Scientific and Technological Advice which was requested by the Conference of Parties held in Kyoto in December 1997 to discuss the Brazilian proposal resolved that the proposal has several outstanding issues that need to be addressed. Brazil agreed to convene a workshop to address these issues at the

time of the Buenos Aires Conference of Parties. The EU, the US, Switzerland and Australia expressed reservations in Bonn on methodologies for reconstructing historical emissions, especially in the absence of reliable data on emissions in the past<sup>4</sup>.

***How will we resolve the contradiction that has been created by the Kyoto Protocol by defining emissions reduction targets for industrialised countries on the basis of their current emissions (that is, 1990 emissions) whereas developing countries may like their emissions reduction to be based on equitable entitlements?***

This contradiction can be easily resolved by accepting both the principles at the same time as no nation would like to unravel the Kyoto Protocol at this stage as long as all nations agree that they will ultimately reach a convergence point. Industrialised countries can start reducing on the basis of reductions on their 1990 baseline of current emissions whereas developing countries agree not to go beyond their 'emissions entitlements' and undertake measures to change their current and future emissions growth path with the help of resources obtained through emissions trading.

These are all relevant issues for negotiations in order to ensure that the framework for international cooperation is not only ecologically effective (that is, it actually leads to global action that averts serious climate change) but it is also socially and economically just.

1 J T Houghton et al 1996, *Climate Change 1995: The Science of Climate Change — Contribution of WG1 to the Second Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, p.39, 45.

2 Florentin Krause, Wilfrid Bach and Jon Koomey 1989, *Energy Policy in the Greenhouse*, Vol. 1, International Project for Sustainable Energy Paths, El Cerrito.

3 Anon 1997, Proposed Elements of a Protocol to the UNFCCC, presented by Brazil in response to the Berlin Mandate, FCCC/AGBM/1997/MISC.1/Add.3, mimeo.

4 Nikhat Jamal Qaiyum 1998, Report on the Brazilian Proposal, Centre for Science and Environment, New Delhi, mimeo.