

The fundamental injustice of climate change (*)

The greenhouse effect symbolises the onslaughts being made on the environment owing to the logic of accumulation. Tens of billions of tonnes of carbon dioxide (CO₂) are being emitted every year through the burning of coal, oil and gas. Climate change will affect ecosystems, the food chain, water, human health – and above all the most vulnerable population groups. Those primarily responsible are still exporting their model of development, even though a world where each and every inhabitant pollutes as much as an average US citizen is inconceivable. The Convention on Climate Change adopted by the international community in 1992 was followed up in 1997 by the Kyoto Protocol. But the North has accumulated such a climate debt to the South that countries in the South balk at joining efforts to reduce greenhouse gas emissions until the North begins to practise what it preaches. Unless the use of combustible fuels is drastically scaled down, the climate will become hotter than humanity has ever experienced and hundreds of millions of people will be affected. Rich countries must reduce their emissions as a matter of urgency, promote clean world development and help the South adapt to that part of climate change which has become inevitable.

Climate debt

The large-scale burning of combustible fuels (coal, oil and natural gas) ever since the industrial revolution and the invention of the steam engine led to a 35% increase in the atmospheric concentration of CO₂ between 1750 and 2005, CO₂ being the main greenhouse gas of human origin.

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CO₂ is an unavoidable waste product of all combustion, and almost half of the amount emitted remains in the atmosphere for about a century; the other half is absorbed by the oceans and by plants. One consequence of the unequal development of North and South is that almost three quarters of the excess CO₂ hitherto accumulated in the atmosphere come from so-called 'developed' countries. Although countries in the South are likely to be emitting more greenhouse gases than those in the North within the next ten to twenty years, the quantities accumulated in the atmosphere will still come mainly from 'developed' countries for a long while.

It is these quantities accumulated over the decades which lie behind global warming, and not directly the CO₂ released in a given year. The CO₂ present in the atmosphere retains part of the heat radiated by the earth in the form of infra-red rays, and the more CO₂ there is, the more is trapped. This inevitably raises the global mean surface air temperature and alters the earth's climate in a process known as 'intensification of the greenhouse effect', referring to the mechanism operating in a greenhouse, where the glass panels play a similar role to that of CO₂. Thus the North, through its CO₂ emissions, has built up a 'climate debt' to the South (Simms, 2005).

The Intergovernmental Panel on Climate Change (IPCC) ⁽¹⁾ estimated back in 2001 that most of the warming effect observed over the past fifty years is attributable to greenhouse gases of human origin. It has likewise concluded that if these emissions continue, without a serious reduction policy, the global temperature will probably rise by 1.1 to 6.4°C between 1990 and 2100, depending on the emissions scenario and the model used (IPCC, 2007; see also Houghton, 2004; Le Treut *et al.*, 2004). Many other

¹ The IPCC was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988 to assess the state of knowledge based on the scientific reference literature. It has published many important reports and documents. Hundreds of specialists participate in the IPCC's work as authors and reviewers, as part of a rigorous and transparent procedure. IPCC reports provide excellent reference material which is widely used by policy-makers, scientists and other experts. The IPCC received the Nobel Peace Prize in 2007 (jointly with Al Gore) 'for their efforts to build up and

climate parameters will be affected too, according to the IPCC: average sea levels will rise by between 18 and 59 cm (at least) during the same period and will continue rising for centuries once the temperature has stabilised. The water cycle will be intensified, generating more droughts in some regions and floods in others.

Several of the changes predicted for this century are starting to become perceptible in climate reporting. The global mean surface temperature rose by 0.6°C during the 20th century, with even higher values in continental regions and in the vicinity of the poles. The number of heatwaves is increasing, and so is the proportion of rain falling in a concentrated fashion, causing floods. Tropical cyclones have also been growing in intensity since 1970. Most small continental glaciers are melting, as is the Greenland ice cap.

The impact of climate change

The IPCC (2001 and 2007) has also evaluated the scientific information available about the impact of climate change on ecosystems, socio-economic sectors – including the food chain and water resources – and human health. The following paragraphs summarise the IPCC's conclusions in these areas (see also Schneider, 1997).

Ecosystems

Global warming may occur at a faster pace than the natural migration of certain plant and animal species, which could be seriously affected or even disappear. This may well be the case for several species of forests. Some plant and animal species (such as those facing extinction and those adapted to narrow ecological niches for which the habitat is discontinuous and migration is hampered or prevented by barriers) and certain natural systems (such as coral reefs, mangrove swamps and other moist coastal

disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that are needed to counteract such change'. Any criticism of the IPCC's assessments usually comes from non-specialists, narrow-minded scientists or individuals funded by industrial groups with an interest in disseminating incomplete information on climate change (Ehrlich and Ehrlich, 1996; Gelbspan, 1998; www.realclimate.org) (Website: www.ipcc.ch).

regions, wet meadows, mountain ecosystems and ecosystems relying on permafrost) will be adversely affected by climatic variations corresponding to a mean global warming scenario of less than 1°C in 2100 compared with 1990 temperatures. With a mean temperature rise of 1 to 2°C in 2100, the harm done to these very sensitive species and systems would be more serious; the risk of irreversible damage or loss would increase, including for additional species and systems. Furthermore, these changes would probably lead to a net decrease in global biodiversity. Approximately 20 to 30% of the plant and animal species so far studied would probably be threatened with extinction if average world temperatures were to rise by more than 1.5 to 2.5°C above 1990 levels.

Food production

Apart from human production factors, food production is mainly influenced by the availability of water and nutrients, as well as by temperature. Rising temperatures could open up new areas to agriculture in regions which are too cold at present, but will also increase the risk of heat or water stress in other regions. All farm animals (cattle, pigs and poultry) are sensitive to heat and drought. Even if the trend is gradual, the effects of climate change will not be uniform. Generally speaking, middle to high latitudes may in certain cases enjoy increased agricultural productivity given a modest overall rise in temperature (up to 2°C above 1990 temperatures on average). By contrast, in tropical and subtropical regions – where some crops are already close to their threshold of tolerance to heat and where non-irrigated farming predominates in dry areas – output is likely to fall. What is more, the adaptability of the least developed tropical countries is limited by a lack of financial resources. So global warming is likely to widen the disparity in food production between developed and developing countries. If overall temperatures were to rise by more than 2°C or so, productivity would also decrease in middle to high latitudes, and the situation in tropical countries would be even worse. A study by Parry *et al.* (2004) found that in the 2080s the total number of people going hungry could rise from 50 to 580 million as a result of climate change. These figures could be lower if plants were able

to take optimum advantage of the enrichment of CO₂ in the atmosphere, but that seems unlikely. Most of the people affected would be in developing countries. Certain regions would be very hard hit, especially arid and sub-humid tropical regions, above all in Africa.

Water

The quantity and distribution of water depend largely on rainfall and its evaporation, both of which may well be affected by climate change. The likely alterations to distribution include increased precipitation at high latitudes and in some equatorial regions, and a decrease in certain regions at middle, subtropical and semi-arid latitudes. This would imply an increase in water stress in the Middle East, around the Mediterranean, in southern Africa, Mexico, some parts of Europe and Latin America, but a decrease in China and southeast Asia. In general, the capacity of existing water supply systems and their responsiveness to changes in demand largely determine how serious an impact climate change will have on water supply. In 1999, 1.3 billion people had no access to an adequate source of safe water, while 2 billion people had no access to proper sanitation, mainly in arid and semi-arid regions (see UNEP, 1999). Climate change entails significant additional stress under such circumstances. In addition to changes in average supplies, extreme climatic events such as drought or flooding are expected to become more problematical in many temperate and humid regions.

Socio-economic effects

The impacts described above affect all of human activity and the very preconditions for development. For example, if sea levels rise by one metre, the surface area of Bangladesh will be reduced by 17.5% and tens of millions of people will be forced to migrate. The existence of many cities located close to the sea, such as London, New York, Mumbai and Shanghai, is under threat in the medium term. Some island states, such as the Maldives and Tuvalu, could quite simply disappear. Over and above these slow changes in average conditions, the frequency and/or seriousness of extreme events such as droughts, floods, cyclones, storm surges and storms are liable to change in a hotter world, with potentially serious human and socio-economic consequences. These might vary in scale

depending on the degree of social organisation and the preparedness of authorities and populations. A tropical cyclone of similar intensity can have very different effects from one place to another. Poor people often have no other choice than to set up home on worthless plots of land in areas prone to natural disasters, such as river banks, unstable hillsides in deforested areas or fragile water basins. Such circumstances not only make the most destitute people vulnerable to natural disasters, but also lessen their capacity to tackle the consequences. The poorest families are sometimes compelled to go even further into debt in order to rebuild their homes, replace their lost possessions and satisfy their most basic needs until income-generating activities can be resumed (De Souza, 2004). The human and material damage caused by Hurricane Katrina in New Orleans reminded us that social outcasts in rich countries are no better off than the inhabitants of Southern countries. The book by Le Tréhondat and Silberstein (2005) is edifying in this regard. Its authors show how the reconstruction effort after the disaster provided an opportunity for the US elite to expel inhabitants who are unwanted because they stand in the way of profit. Indeed, Condoleezza Rice even stated after the tsunami in December 2004 that this was ‘a wonderful opportunity’ for the United States and ‘has paid great dividends for us’ (Le Tréhondat and Silberstein, 2005).

Refugees

The migration of populations affected by gradual or sudden climate change could obviously increase the risk of political instability and conflict. These risks are alluded to cautiously in the IPCC’s reports. A report issued in October 2003 by two experts working for the Pentagon, P. Schwartz and D. Randall, is far more explicit (Schwartz and Randall, 2003). Oddly enough, while the official discourse of the Bush administration at that time still sought to minimise the significance of climate change and its anthropogenic causes, this report – which was kept secret for several months – envisages a doomsday scenario where the climate becomes chaotic and refugees fight over what meagre food resources are still available. The authors conclude in particular that the

United States and Australia will be tempted to build defensive fortresses around their countries because they have the resources and reserves to ensure their own self-sufficiency; borders will be reinforced in all countries so as to keep away undesirable immigrants from Caribbean islands, Mexico and South America; in this world of warring states a proliferation of nuclear weapons will be inescapable. Thus climate change serves here to justify spending additional resources on strengthening the USA's role as global policeman in a world where control over basic resources – energy, food and water – counts more than ever before (Valantin, 2005).

Human health

The repercussions of global climate change on human health include changes in the geographical extension and seasonality of various infectious diseases, the effects of malnutrition and famine due to a redistribution of food and water resources, and an increase in the mortality and morbidity rates associated with heatwaves.

The relative vulnerability of different regions to each of the potential impacts indicated above is largely determined by their access to resources, information and technology, and by the stability and effectiveness of their institutions. This means that opportunities for sustainable development will be more seriously hampered by climate change in developing countries and among deprived population groups. Of course, climate change will not be accountable for all the problems encountered by developing countries in the coming century, but it will make satisfying the basic needs of their populations more difficult in both the short and long term. Climate change is likely to heighten iniquity on a global and regional scale, both within existing generations and between present and future generations.

Response strategies: contraction and convergence

The international community has been very slow to grasp the scale of climate issues. Even though scientists began to sound the alarm bell back in the late 1950s (?), and the First World Climate Conference recognised

in 1979 that significant climate change could result from the intensification of the greenhouse effect, it was not until 1992 that the United Nations Framework Convention on Climate Change (UNFCCC) ⁽³⁾ was adopted at the UN Conference on Environment and Development in Rio de Janeiro. Article 2 of the UNFCCC states that the ultimate objective of the Convention is 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'. This article refers to the need to achieve this level 'within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner'.

The European Council of Ministers is the only political body to have expressed an official view on quantifying this objective. The European Council of 23 March 2005 reiterated the stance adopted back in June 1996: it 'confirms that, with a view to achieving the ultimate objective of the UN Framework Convention on Climate Change, the global annual mean surface temperature increase should not exceed 2°C above pre-industrial levels'. Shortly before that, on 10 March 2005, the Council of Environment Ministers stated: 'Recent scientific research and work under the IPCC indicate that it is unlikely that stabilisation of concentrations above 550 ppmv CO₂ equivalent would be consistent with meeting the 2°C objective and that in order to have a reasonable chance to limit global warming to no more than 2°C, stabilisation of concentrations well below 550 ppmv CO₂ equivalent may be needed'. We have already reached 380 ppmv CO₂ today, and taking into account the extra effect of other greenhouse gases this corresponds to about 450 ppmv CO₂ equivalent. So

² The researchers Revelle and Suess (1957) write: 'Human beings are now carrying out a large scale geophysical experiment of a kind that could not have happened in the past nor be reproduced in the future. Within a few centuries we are returning to the atmosphere and oceans the concentrated organic carbon stored in the sedimentary rocks over hundreds of millions of years.' They go on to argue successfully for constant monitoring of atmospheric CO₂ levels.

³ Available at: <http://www.unfccc.int>.

we might already have exceeded the maximum level considered dangerous by the European Union.

Such an objective cannot be achieved without seriously limiting the total volume of CO₂ emitted by humanity over the next century. Such limitation means that worldwide emissions of greenhouse gases must gradually contract as compared with today's levels. This is the first of two ideas that Aubrey Meyer of the Global Commons Institute has been propounding for the past fifteen years or so (Meyer, 2000): in order to progress towards climate protection, we must first of all accept that the total quantity of greenhouse gas emissions has to contract. The question that follows is: how should we divide up the emissions cake between countries?

The Convention can help us here too. Article 3 acknowledges the 'common but differentiated responsibilities' of developed and developing countries. They are common in that we all share the atmosphere – 1 kg of CO₂ emitted in New York, Brussels or Ouagadougou has the same effect on the climate – but differentiated in that the carbon footprint of an average US citizen is 25 tonnes of CO₂/year, that of a Belgian 12 tonnes and an inhabitant of Burkina Faso about 100 kg (in the energy sector). Some participants at the Rio conference attempted to dismiss these huge differences by emphasising the part played by the developing countries' demographic growth in pushing up greenhouse gas emissions.

But in the countries where this demographic growth is taking place, the average per capita consumption of goods and energy is considerably lower than in developed countries. For instance, it has been calculated that between 1950 and 1990 the increase in CO₂ emissions per inhabitant in developed countries played a bigger role in increasing world CO₂ emissions than demographic growth in developing countries (Bartiaux and van Ypersele, 1993). This explains why the Climate Change Convention recognises that the developed countries should 'take the lead in combating climate change and the adverse effects thereof'.

Another important principle underpinning Article 3 of the Convention is equity. In order for agreements to be effective and encourage cooperation, they must be deemed legitimate. As the IPCC recalls, equity is an

important factor in legitimisation. Given that developed countries have caused the bulk of the problem, that their per capita CO₂ output is far higher than the rest of the world and that developing countries need to augment their emissions in order to develop, the industrialised countries have contracted a moral debt towards the rest of the world and future generations. How should the burden of this debt be shared out? The debate is far from over, but it is already clear that industrialised countries must reduce their emissions more than developing countries.

This in fact is the second idea propounded by Aubrey Meyer: gradual convergence of per capita emission levels towards a single level consistent with the size of the 'authorised emissions cake'. The negotiators' jargon (see Gupta, 2001) speaks of 'C&C', or 'contraction and convergence'. Raúl Estrada, the Argentine ambassador who presided with such panache over the birth of the Kyoto Protocol ⁽⁴⁾, finds C&C attractive on paper but does not believe that it solves the fundamental question of equity which, he points out, is merely a substitute for the notion of equality (Estrada, 2000). Developing countries are not willing to countenance even the slightest limitation of their growth, especially as the developed countries have been able to pollute for such a long time without any constraints and some refuse to subject themselves to the unambitious Kyoto targets (see also Athanasiou and Baer, 2002).

So how are we to move forward? Perhaps the solution will come from one of the most frequently criticised mechanisms set out in the Kyoto Protocol. It provides for the possibility that industrialised countries might achieve their reduction targets in part by trading a share of their quotas with each another (and not with 'Southern' countries for the time being, contrary to what many authors have written). Such a system is regularly dubbed immoral because it enables certain countries to buy, with a clear conscience, the right to pollute more. Yet it just makes the need to limit pollutant emissions even more apparent.

⁴ The Kyoto Protocol complements the Convention on Climate Change and obliges the developed countries which have ratified it to reduce their emissions by an average of 5% between 1990 and 2008-2012 (see van Ypersele, 1998).

In practice, whenever a car driver buys 10 litres of petrol, without realising it he/she at the same time buys the right to send into the atmosphere the 25 kg of CO₂ generated by its combustion. And the driver does not have to worry about purchasing this right from another inhabitant of the planet. The ethical problem connected with permit trading therefore has more to do with the way in which the quotas, or 'emission permits', are initially divided up between countries. If they are initially shared out according to a principle of equity rather than one of 'acquired rights', permits could even be an excellent means of conveying aid to developing countries under certain conditions (Grégoire *et al.*, 2000). And provided that the total quantity of permits is determined by the desire to protect the climate for the coming decades and centuries (contraction), such a system would mean that the necessary reductions in emissions could be made at the best possible cost.

It should be pointed out that the environmental efficiency of the system depends solely on the total quantity of permits issued, and not on their distribution. One of the great Indian ecological thinkers, the late Anil Agarwal, published an article shortly before the Rio summit in which he proposed exactly that: dividing up fairly the total world emissions 'authorised' in terms of climate protection by the number of inhabitants on earth, and then allowing these 'pollution rights' to be traded (Agarwal, 1992). Countries not using up their rights could sell them to those exceeding their own allocation: it would be like a worldwide Kyoto, but with built-in equity. Following on from the Bali Conference at the end of 2007, we shall see whether or not the international community comes out in favour of such a process, the only one that would really enable us to protect the climate in a socially equitable manner.

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