

DEVELOPING PERSPECTIVES ON CLIMATE CHANGE

Issues and Analysis from Developing Countries and Countries with Economies in Transition

Conditions for Greater Commitment of Developing Countries in the Mitigation of Climate Change

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Introduction

The objective of this paper is to discuss the Latin American and Caribbean perspective on incentives, possibilities and alternatives available to those countries commonly referred to as developing countries for the enhancement of climate change mitigation actions while simultaneously contributing to their own sustainable development objectives.¹

Such incentives, possibilities and alternatives depend on both external² and internal³ factors and should be analyzed, not only in the context of the United Nations Framework Convention on Climate Change (UNFCCC) and international negotiations on this matter, but also with respect to Agenda 21 and the process of globalization.⁴

Developing countries and voluntary commitments

Since the establishment of the UNFCCC, but particularly since the Kyoto Protocol, there has been some pressure on developing countries from countries that have undertaken quantified limitation/reduction commitments of greenhouse gas (GHG) emissions (Annex I of the UNFCCC, Annex B of the Kyoto Protocol), to assume some kind of quantifiable commitment.⁵ The request is based on the reasoning that the efforts of industrialized countries alone will not be sufficient to meet the objective of the Convention and that there is a need for significant participation on the part of key developing countries.⁶

This situation became more apparent when, in July of 1997, the United States Senate adopted the Byrd-Hagel Resolution which made it clear that the United States would not ratify the Kyoto Protocol if it would damage the U.S. economy to a certain extent, and if it did not include “significant participation” by key developing countries through commitments to limitation/reduction of greenhouse gas emissions during

the commitment period. Therefore, the acceptance of a significant commitment by developing countries (at least those mentioned as key developing countries) seemed, in fact, to become one of the prerequisites for the eventual ratification of the Kyoto Protocol by the United States.

Discussions regarding voluntary commitments were an important element in the preliminary agenda of the fourth Conference of the Parties and during COP-4 and COP-5 meetings. During COP-4, the then President of Argentina announced that the Government of Argentina was prepared to establish goals for GHG emissions for the 2008–2012 period.^{7, 8} These goals were finally brought to light during COP-5, and thus Argentina became the first Non-Annex I country to manifest a willingness to assume commitments of this kind during COP.^{9, 10, 11}

The Argentine proposal was well received by industrialized countries but was firmly rejected by G-77 and China. Even those countries most inclined to deal with the matter understood that opening the discussion would lead to an amendment to the Kyoto Protocol, which was not viable at that point in the negotiation process.¹²

Since the Argentine proposal there have been a number of other ideas put forth regarding how developing countries could take on voluntary commitments. For instance, during the negotiations, several South American countries raised the unilateral Clean Development Mechanism (CDM) proposal, in which investments would be carried out by each country, the avoided emissions would be certified by a third party and “banked” or traded in the international market. The main difficulty with this proposal was that of additionality, and it never reached the formal discussion stage.¹³

As for Africa, its focus on “avoided emissions”¹⁴ rests on the limited contribution of Africa with respect to the burning of fuel and the limited opportunities to

host CDM projects. Even though total emissions might increase in absolute terms, the project would produce a lower intensity of emissions than the alternative and this “difference” would constitute an environmental credit while contributing to sustainable development. In any case, the problem is linked to the determination of baselines and, therefore, to additivity.

Recent studies,¹⁵ of the Mexico,¹⁶ Korea,¹⁷ South Africa,¹⁸ Argentina,¹⁹ and Brazil²⁰ cases, among others, have revealed that the differences in national interests and circumstances have an obvious influence over which options are considered viable. Therefore, the search for different alternatives such as the proposals for the application of the CDM at the sector level,²¹ the adoption of dual goals related to the intensity of emissions,²² the use of per capita emissions as an indicator for the eventual establishment of new mitigation commitments,²³ or other proposals, are a reflection of the diverse realities and preferred options of each country.

On the other hand, from the point of view of cost analysis and global effectiveness, it isn't necessarily true that mitigation costs will be lower in developing countries than in developed. According to research developed with the POLES model by the Institut d'Economie et de Politique de l'Energie (IEPE) of Grenoble, the opposite is often true. At a regional level, costs are more dependent on the starting point (the base scenario) than on the relative level of development of the Area.²⁴

Taking these aspects into account, several questions arise regarding the way negotiations will develop around this issue in the future and about the shape of eventual voluntary commitments: whether they will be incorporated into the UNFCCC and the Kyoto Protocol, or if there will be additional juridical instruments to consider such possibilities.

Climate change efforts of Non-Annex I countries

Contrary to what is presented as fact by the Byrd-Hagel Resolution,²⁵ there are numerous examples of the real contribution of developing countries, especially from Latin America and the Caribbean, towards climate change prevention and mitigation, although these were not always carried out with the concrete objective of mitigating climate effects. The important efforts of developing countries are mani-

festated in different actions related to the negotiation process itself, with significant resources dedicated to scientific and technical activities on this issue, the identification of mitigation and adaptation strategies and policies, and actions for controlling their greenhouse gas emissions through sector-based policies and actions.²⁶

Despite not being primarily responsible for the problem, the fact that a potential global threat could have greater effects on developing countries than on industrialized countries, has motivated developing countries to participate actively in the international negotiation process, and to allocate material and human resources in disproportionate amounts. Their mere presence at the UNFCCC negotiation table indicates the diversion of resources from other objectives of national priority towards studies of the problem. The generation of proposals based on in-depth scientific and technical research demonstrates a willingness and tremendous effort on the part of countries that have a low level of development and limited resources. These actions are well documented in various studies.²⁷

In developing countries in general (and especially in Latin America and the Caribbean), concrete policies and actions regarding climate change have been developed and implemented, whether or not this was exclusively the original intent. Such is the case, for example, in the reduction and elimination of energy price subsidies,²⁸ energy efficiency measures,²⁹ fuel substitution,³⁰ development of renewable energies or introduction of clean fuel in the transportation sector, among others.³¹ These measures translate into a reduction in the proportion of greenhouse gas emissions by unit of Gross Domestic Product (GDP), known as carbon intensity.

In many instances, carbon intensity is a better indicator of “climatic performance” than total emissions. A country with increasing emissions may be more efficient in this sense than another whose emissions have decreased: China and Russia serve as good examples.

On one hand, China's carbon intensity has decreased by about 45 per cent since 1980, primarily due to the fact that its carbon subsidies were reduced from 61 per cent in 1984 to 29 per cent in 1995, while oil subsidies decreased from 55 per cent in 1990 to two per cent in 1995. Despite this, annual emissions in China increased by approximately 500 million tonnes of carbon (MtC) from 1980 to 1997, but the implementation of these measures and increased

energy efficiency during this period avoided the emission of 432 MtC.³² On the other hand, Russia's total emissions were reduced by more than 169 MtC (26 per cent) from 1990 to 1995 due to its economic crisis, while its carbon intensity increased by about 18 per cent.³³ Under these criteria, it could be said that China has done more than Russia to combat climate change in recent years, even though its emissions have continued to increase. Regardless, China is being asked to assume commitments while Russia will be permitted to benefit from trading emission reductions resulting not from mitigation measures but from its economic crisis.

In the case of Latin America, it is the region with the lowest specific emissions by electrical unit in the world due to enormous economic efforts made to develop hydroelectricity, often translating into heavy external debt.³⁴ These actions carried out largely by Latin American and Caribbean countries, mostly in the '70s and '80s, can be interpreted as the best example of the application of "early actions" in the prevention of climate change. Nevertheless, the implementation of these "early actions," did not result in benefits in relation to compliance with Kyoto Mechanisms. Instead, they prematurely exhausted many of the least-costly mitigation options (for example, fuel substitution), before the Mechanisms came into force and the consequent modification of future Base Scenarios.

Therefore, as long as the "early actions" are previously achieved domestic efforts which become part of the Base Scenario, the measures and projects that could be certified within the CDM as additional ones will be more complex and comparatively more expensive for each tonne saved/reduced. This is in comparison with those of other Parties that have made no previous efforts in this area. This logic, which benefits those that have delayed applying mitigation measures instead of those that have already made efforts, does not constitute a fair criteria to allocate the opportunities to take advantage of the CDM, and is an unconvincing argument for the application of "early actions" from the viewpoint of some developing countries, especially those in Latin American and the Caribbean.³⁵ In another direction, there is no reason to believe that such actions are only beneficial if undertaken by developing countries. If they were positive, regardless of the country applying them, there would be no reason for delays in their implementation in industrialized countries.

An assessment of the CDM

Additionally, an in-depth analysis is still pending on the real opportunities and advantages that the adoption of the Kyoto Mechanisms would provide for the great majority of developing countries (especially low emission countries). Also pending, is analysis on the implications of the mechanisms on environmental matters (compatibility of climate change mitigation with other global and local environmental objectives) and economic matters (primarily with respect to the international distribution of mitigation costs). Facts demonstrate that this situation cannot be easily generalized to fit all cases, as there are differences in possibilities available to the different actors in terms of their influence on emissions reduction markets.

These possibilities will be related to factors such as: (a) the costs associated with reducing the existing emissions in each country, (b) the quantity of emission reductions that might be offered and (c) the treatment that will finally be used with respect to hot air. It's obvious that the greater the quantity of hot air placed in the market by those who own it the lesser the possibilities for low-emission countries and high-mitigation cost countries to enter this market. Therefore, only marginal market participation can be expected on the part of low-emission countries.³⁶

To this effect, it may be assumed that when the global market opens for the emissions reduction certificates, the main providers will be China, Economies in Transition (EIT), and India, offering, together, more than 80 per cent of the emissions supply. The remainder, less than 20 per cent, will be shared by 130 countries including, for example, Brazil, Mexico, Indonesia, Malaysia, and Korea.³⁷

The convenience of assuming commitments should be defined using the evaluation of such opportunities as a starting point.

The actual justification of the Kyoto Mechanisms is based on the hypothesis that developing countries have not assumed quantified commitments on emissions reduction. Evidently, the analysis results change if this type of commitment by developing countries is considered. If that were the case, there should be an evaluation of the optimum moment for assuming commitments: technological evolution, actual and future costs, and the potential depletion of the most cost-effective options in the short and medium term should be considered. This would prevent the prema-

ture depletion of the most advantageous mitigation options (used by Annex I countries) leaving the most costly options to the developing countries to meet their own commitments.

Voluntary initiatives and voluntary commitments

The additional question is: What is the difference between a voluntary initiative and a voluntary commitment in the case of developing countries? What would be the difference in the case of many developing countries, if, upon implementation of their initiatives, these had been presented as a voluntary commitment and if it had been specified that they were intended to mitigate their greenhouse gas emissions?

A real and viable commitment for developing countries would not be vastly different from those measures that are already being implemented, since taking into account their “national circumstances,” the nature of any mitigation commitment at this moment should be qualitative rather than quantitative.

The fact that developing countries should be permitted to increase their emissions as a natural consequence of their economic development (among many other good reasons) makes it very unlikely that any of them will be disposed to make a commitment to absolute emissions reduction. For this reason it has been thought that a commitment for Non-Annex I countries should be in the form of a limit to their annual emission rate increase. However, there are environmental problems inherent in this option.³⁸

When this type of voluntary commitment is established, the main problem resides in the establishment of a sufficiently robust future emissions scenario for developing countries, since it is dependent on economic growth and energy demand projections, which are subject to great uncertainties.³⁹

For example, The Korean National Communication to the FCCC forecasts a 5.2 per cent increase in its annual emissions between 1996 and 2010 (equivalent to 217 MtC for 2010), a scenario based on a 5.3 per cent increase in its annual Gross Domestic Product.⁴⁰ The report mentions that the next National Communication will revise these emission projections as the Korean economy is experiencing unexpected economic problems.

This means that if Korea had accepted a voluntary limit on its emissions in Kyoto, and if the Asian crisis

were to continue, this commitment, instead of contributing to greenhouse gas emission reductions, would have created what is known as “hot air,” resulting in less stringent emissions reduction targets for the Annex I Parties through the trading of emissions.

The global socio-economic context

There should be an analysis of the international socio-economic context and the challenges imposed by the existing process of globalization when developing proposals for sustainable development, and for the implementation of actions for climate change mitigation. It is also important that there be an evaluation of the intrinsic sustainability of these processes in their current state of development.

The current process of globalization allows for different means and interpretations⁴¹ and generates challenges of an eminently political nature. Such challenges imply the need to promote a different type of globalization but, meanwhile, determine the sustainability of development.

One of the principal challenges relates to the degree of compatibility between the different dimensions of sustainability. To what degree is the current process of globalization in its present form the main threat to such sustainability? How is this globalization process articulated in international negotiations? In the case of a developing country, how can the need to increase competitiveness, reduce costs, redistribute income, act to mitigate climate change and adapt to its impacts be made compatible in this context?

Until now, it has not been possible to find adequate answers to these questions, especially given the considerable increase in partisan points of view that focus on one particular issue in isolation from the rest of the system. The challenges have led to a growing need for full analysis, resulting in many research studies on globalization and sustainability.^{42, 43, 44}

The last two decades have meant a radical process of change where the market’s rhetoric has prevailed. Also, there has been an absence of controls and a minimization in the role of the state and all of which are benefits to promote welfare and development. Despite this, in many regions of the world, the current “model” has given few and limited solutions to environmental, social, and even economic problems. The most favourable allocation of resources made possible by the free market has been unable to adequately allocate environmental resources and has

resulted in a double message that is essentially contradictory: it is necessary to exercise the least interference possible on the market forces, but at the same time, it is necessary to intervene and orchestrate mechanisms so that the market is capable of resolving global environmental problems and the resulting local consequences.

It is becoming increasingly evident that the majority of nations cannot meet their development targets and that very few will be able to reach sustainability without changes in the world market and the manner in which development assistance is currently provided. A government that is attempting to resolve a debt crisis and whose currency is dependent on the exportation of natural resources cannot tackle long-term sustainability issues. There needs to be a more sustainable base for the marketing of natural products that would change the relationship between the main consumer markets (Europe, North America and Japan) and the nations of the South, who are the primary providers of natural resources.

It is also difficult to find an ethical and moral base for the requirement that the poorest countries, whose economies have used so little of the non-renewable resources or whose contributions to pollution have been minimal, now be denied use of the cheapest energy sources because the developed world, in obtaining its riches, has pressured and exhausted so much of the world's resources.

For the majority of citizens in developing countries it is difficult to share the concerns for global warming and other environmental concerns of a global nature. The issues of climate change mitigation and long-term survival of the planet are regarded as distant problems by those who have difficulty with day-to-day survival. Governments in developed countries cannot expect to promote long-term sustainable development in poor countries when so many citizens of these countries have serious short-term environmental problems. A program to mobilize all governments to deal with environmental problems must assist each country to identify, analyze and take action concerning its own environmental problems.

In any case, given that it is known that climate change will have a more serious effect on certain regions than others, the people, natural resources, and socio-economic systems of developing countries are the most vulnerable to the expected effects of climate change. This is not only because the potential impacts on

them are significant,⁴⁵ but also because the capacity to face these impacts is lesser in developing countries, especially for their poorest citizens.⁴⁶

As a result, within the policies related to climate change, the issues that deal with vulnerability and adaptation are more urgent for developing countries than are the mitigation measures, especially given that there are adaptation measures that must be carried out immediately. In the meantime, countries need to adapt to the damages caused by current climate variability more so than the phenomenon of long-term climate change. In any case, if current climate variability is reduced through the appropriate policies, starting from an improved level of knowledge and information, it will also lead to a reduction in long-term vulnerability of the socio-economic system to climate change.

However, until now it has been evident that, on the international stage, more importance is placed on mitigation than on adaptation. Even in those countries that do not have quantitative mitigation commitments but are extremely vulnerable to climate change, there has been disproportionate attention to mitigation rather than adaptation.⁴⁷ This situation is aggravated thus far by the limited contribution of industrialized countries in assisting those countries that are least prepared to adapt to climate change and most threatened by its consequences, despite what has been established at UNFCCC. Even the limited funds that will be dedicated to this purpose will be available through CDM (the only mechanism available to developing countries), while the International Emissions Trade and Joint Implementation is exempt from this contribution.

In this way, developing countries suffer from the phenomenon of "double exposure"⁴⁸ to changes in the global context: climate change and globalization are two simultaneous processes and these regions, economic sectors, ecosystems and social groups face disadvantageous impacts of both. Not only will they face the worst of the potential impacts, they are also the least capable of facing them. The deterioration of the state, due to the adjustment plans of international organizations, increases vulnerability even more and, therefore, the "institutional" capacity to face the impacts is also questionable.

The conflict created by the distribution of mitigation costs

Any policy to reduce GHG emissions that can be pursued will have some sort of negative effect on the economies that implement these policies. They will also have differential consequences on the various sectors and activities involved. Because the final outcome may be very detrimental for some countries, this has been one of the main sources of conflict in international negotiations regarding the manner in which the costs of preventing climate change should be distributed among the various countries.

With regards to the allocation of resources, it is clear that the funding earmarked for mitigation actions may not be available for alternative uses, some of which (as is the case in the fight against hunger and poverty) are more urgent in developing countries than reducing GHG emissions and the prevention of long- and medium-term projected effects of climate change. At the same time, given the existing levels of heterogeneity between the countries and between the various social groups within each of these countries, the range of alternatives with respect to adaptation to changes and the mitigation of the resulting consequences will have varying costs from country to country. Developing countries and developed countries will face different problems, as the former are more vulnerable to the effects of climate change and the latter have greater technical and economic capacity to confront their problems. There are also different interests and priorities within the two groups of countries. Even taking all of the above into account, countries may choose to focus on different approaches to tackle the same matters.

In the case of developing countries in particular, the possibility of acquiring scientific and technological knowledge is hindered by economic limitations, thus creating difficulties in defining their own priorities.

Great economic effort will be required of developing countries in order to adapt to a situation in which generalized responsibilities for the control of CO₂ emissions are established. Consequently, these countries will need financial assistance to acquire the technologies that will permit them to achieve higher levels of efficiency and rationality in energy use. In addition, it will also be necessary to have international consensus and agreements which will make the measures regarding the management of the energy sector required by the World Bank and other International

Credit Organizations compatible with GHG emissions reduction actions recommended by the UNFCCC and the IPCC.⁴⁹

Nevertheless, the problem of distributing climate change mitigation costs surpasses the framework that exists between developing and developed countries commonly referred to as the “North-South Conflict.” It can be said that there are, in principle, at least two conflicting camps regarding the predisposition on measures that should be adopted on the issue of climate change: an obstructionist position (to make the least possible domestic effort) and another with greater predisposition to action, and a wide range of intermediary positions. Both developing and developed countries may be found in each of these camps, and the reasons for belonging to one or the other depend on each country’s interests.^{50, 51, 52, 53}

Is the generalization of commitments justified at this stage?

There is an ever-increasing tendency to look for aggregate indicators, averages, or to group into a single category, elements that share some basic aspects but are essentially different. A clear example of this is the grouping together of countries into one category based on an apparent homogeneity in attitudes towards climate change which reality does not bear out. In the search for greater simplification, explanatory richness is lost, as is the effectiveness of the indicator or group expected to demonstrate a homogeneous attitude. This tendency makes the analysis invalid and not representative of either the generalization or phenomenon that it tries to explain or highlight.

These considerations may be applied mainly to the definition of Non-Annex I countries as a homogeneous group of developing countries. Within the Non-Annex I grouping exists significant heterogeneity with regard to political, social and economic matters, levels of development, resource base and environmental matters (to mention only the most significant differences). Nevertheless, this grouping also demonstrates significant differences when compared with the grouping of Annex I countries.

Even if the volume of annual emissions is the only reference used,⁵⁴ there are some significant data.⁵⁵ In accordance with data published by IEA (2002), Annex I Parties (36 countries) were responsible for 59 per cent of worldwide emissions in 2000, while the

remaining 41 per cent originated in the Non-Annex I Parties (more than 150 countries). From the total for Annex I, 48 per cent corresponded to Annex II Parties and the other 11 per cent was attributed to the former Soviet bloc countries, referred to as Economies in Transition (EIT). Among the Non-Annex I Parties, the main contributors were China (13 per cent of total worldwide emissions), Asian developing countries (including Korea and excluding the Middle East) with more than 11 per cent, the Middle East at 4.2 per cent, Latin America at 3.6 per cent and Africa at three per cent.

If accumulated emissions for the period between 1986 and 2000⁵⁶ are compared, the Annex I Parties were responsible for more than 63 per cent of emissions (Annex II Parties were responsible for almost 48 per cent and EITs for 16 per cent) and Non-Annex I Parties were responsible for close to 37 per cent of the total. Within the Non-Annex I group, China was responsible for slightly over 12 per cent of the worldwide total, Asian developing countries for nine per cent, the Middle East for 3.5 per cent, Latin America for 3.3 per cent and Africa for three per cent. These figures indicate the current tendencies in GHG emissions: EIT emissions have fallen in comparison with their historical trend, and there has been an increase on the part of China, Asian developing countries and the Middle East, and relative stability in Latin America and particularly in Africa. The contribution of the Annex II Parties grouping, meanwhile, shows practically the same figures, the result of a relative decrease in European emissions (16 per cent in the 1986–2000 accumulated figures dropping to 14 per cent in 2000), which is compensated for by an equivalent increase in North America, mostly in the United States.

Figure 1 presents IEA (2002) information on CO₂ emissions by the major emitters for the year 2000, arranged from highest to lowest. The presentation of this data divided by country is interesting in that the grouping of different countries according to various criteria (geographic location or similar socio-economic or productivity characteristics) may lead to losing sight of the existing heterogeneity and the differences in the quantity of emissions which each produces.

It is obvious that there is a noticeable distance between the main worldwide emitter (United States) and the second and third emitters (China⁵⁷ and the Russian Federation, respectively). There is also a significant distance between these and the rest.

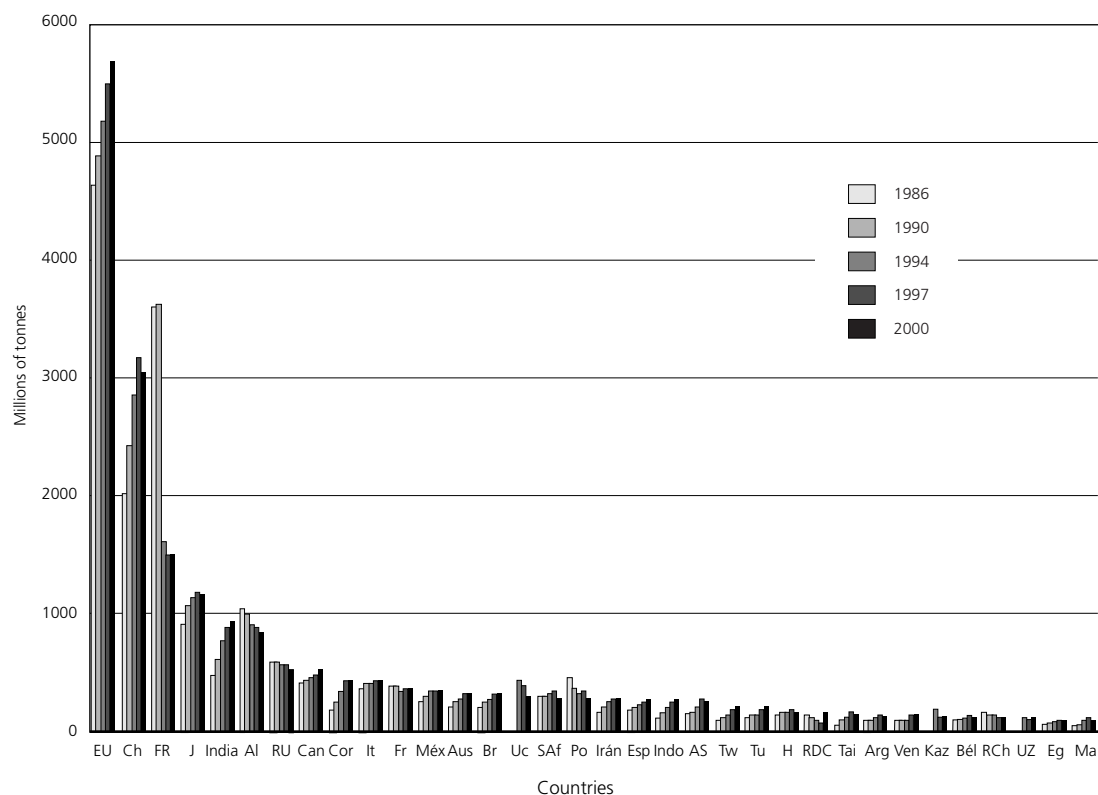
Similarly, a second group of three countries (Japan, Germany and India) stands out as having levels noticeably higher than the remaining countries but still nowhere near the emission levels of the first three countries. From that point on in the graph, emission levels decrease steadily until the end of the list of more than 170 countries for which there is data. To demonstrate a pattern for the concentration of emissions among the main emitters, the United States accounts for almost one quarter of the worldwide total for that year; the top three emitters are responsible for almost 44 per cent of the total; the first six for 56 per cent; and the first 21 countries for 79 per cent of all emissions worldwide.⁵⁸

Also, it may be observed that with the obvious exception of EIT countries and a few developed countries (Germany is an obvious example and, to a lesser extent, the United Kingdom and France), all other cases on this graph show an increase in their emissions from 1986 to 2000.⁵⁹ This is the case even though many of the countries that are represented on the graph belong to Annex I of the UNFCCC and, therefore, undertook the commitment at that time to return to 1990 emission levels by the year 2000.⁶⁰

Based on the information available through IEA (1998), (1999) and (2002), if emissions for the period 1986–2000 are analyzed, rather than those for 2000, the results are still significant. During this period, the United States was accountable for a quarter of the total of worldwide emissions, the first three countries (United States, China and the Russian Federation) accounted for close to 50 per cent of emissions; the first six countries (adding Japan, Germany and India to the list in that order) accounted for more than 60 per cent of emissions; the first 10 countries (including on the list the United Kingdom, Canada, Italy and France), accounted for more than 70 per cent and the first 20 countries accounted for more than 80 per cent of all worldwide emissions.⁶¹ The contribution to the accumulated emissions for this period of each of the remaining countries is less than one per cent of the total.

The information provided shows that there is a significant concentration of emissions in a few “Parties,” which should facilitate the task of deciding where to “control” emissions, instead of attempting to generalize the commitments to the developing countries group. This concentration of emissions is even greater when longer periods of time are used in the analysis.

Figure 1. Principal CO₂ Emitters (According to 2000 Ranking)
(in Million Tonnes)



EU: United States, Ch: China, FR: Russian Federation, J: Japan, Al: Germany; RU: United Kingdom Can: Canada, Cor: Korea, It: Italy, Fr: France, Méx: Mexico, Aus: Australia, Br: Brazil, Uc: Ukraine, SAF: South Africa, Po: Poland, Esp: Spain, Indo: Indonesia, AS: Saudi Arabia, Tw: Taiwan, Tu: Turkey, H: Netherlands, RDC: South Korea, Tai: Thailand, Arg: Argentina, Ven: Venezuela, Kaz: Kazakhstan, Bél: Belgium, RCh: Czech. Republic, Uz: Uzbekistan, Eg: Egypt and Ma: Malaysia.

Source: Girardin (2000) page 129, based on IEA data (1998); (1999) y (2002).

Empirical evidence demonstrates an increasing trend in developing country emissions and a greater participation in worldwide GHG emissions among this heterogeneous group of countries. However, the eventual greater future participation in worldwide GHG emissions of developing countries should not obscure the fact that the main cause of global warming is not the effect of recent emissions, but rather the atmospheric concentration of GHGs (mainly CO₂), past emissions and the amount of time that these have been in the atmosphere.⁶²

Table 1 demonstrates that the historical contribution of the developed countries is much greater than their current emissions. Some calculations show that developed countries' accumulated emissions from the early 19th century to the present account for about 84 per cent of the total and even today are responsible for the majority of worldwide emissions, in spite of the fact that they make up slightly over 20 per cent of the world population.⁶³ So, if developing countries' recent emissions are all that is taken into account, their contribution to climate change will be overestimated.

Table 1. Geographic Distribution of Accumulated CO₂ Emissions.

Countries and Regions	% Accumulated Emissions⁽¹⁾
North America	33.2
Western Europe	26.1
Eastern Europe and former USSR	19.6
Japan and Oceania	4.8
Total Developed Countries	83.7
Total Developing Countries	16.3

Source: Prepared based on data originally quoted in Bhaskhar, V. (1995), which were based on Grubler and Nakicenovic (1992) and Young (1991). (1) Contribution to current atmospheric CO₂ concentrations, based on emissions accumulated since 1800.

These results reinforce the responsibility of developed countries in the climate change process and in the effective application of the UNFCCC and the Kyoto Protocol, through the fulfillment of commitments that they have assumed in each one. Developing countries have an important role to fill in the international effort to control CO₂ emissions, but under no circumstances can their own responsibilities⁶⁴ be equated to those of developed countries. Also, according to what UNFCCC itself recognizes, they can fulfill this role while maintaining their right to increase energy consumption per capita as a result of their development process. In this sense, the use of renewable energy and the use of more efficient technologies may raise their per capita energy consumption without increasing their CO₂ emissions, as was generally the case in Latin America between the '70s and '90s.⁶⁵

Beyond the question of fairness,⁶⁶ some estimates show that, in order to stabilize atmospheric CO₂ emissions to 1990 levels around the year 2100, there must be a 60 per cent reduction of current emissions.⁶⁷ Therefore, keeping in mind the proportion within the total of emissions for which each group of countries is responsible, the growing emphasis placed on developing countries to reduce their emissions (with no distinction being made as to their different circumstances) by developed countries, even before demonstrating any significant advances in the fulfillment of their own commitments, is not ethically sound nor does it resolve the problem of the increase in atmospheric concentrations of CO₂ on a global level.

The difficulties of categorizing developing countries as a uniform group

Of the 34 countries that have been identified as the main CO₂ emitters in Figure 1, only 15 are included in Annex I. Of the remaining 19, there are three countries (Turkey, Uzbekistan and Kazakhstan)⁶⁸ which, for various reasons, did belong to Annex I at one time, but are no longer included. Another three countries (Turkey, Korea and Mexico)⁶⁹ belong to the OECD, but still have a ranking as a developing country and therefore were not obliged to take on quantified emission limitation and reduction commitments.

Heterogeneity, with respect to the GHG emissions of the developing countries group, is the obvious conclusion to be made of the analysis of the information. China is in second place in worldwide emissions (increasingly distancing itself from the third place country), and India is in fifth place (practically reaching Japan's levels and surpassing those of Germany). These two countries together contain more than one third of the world's population, and are not only major emitters but they also have very low per capita levels of emissions. This situation gives them a very significant growth potential in the future, particularly when considering the strong presence of fossil fuels in their energy matrix. Therefore, the magnitude of their current emissions in absolute terms and their potential for increase, makes them fundamental players in the future development of international negotiations for climate change prevention and for the distribution of mitigation costs among the various countries of the world.⁷⁰

The information also shows that there are 10 countries that are important producers and exporters of fossil fuels, hydrocarbons as well as carbon (Mexico, South Africa, Iran, Saudi Arabia, Indonesia, Venezuela, Kazakhstan, Uzbekistan, Egypt and Malaysia⁷¹), and therefore, a large portion of their emissions are associated with these sectors. Similarly, five of the "Asian Tigers" (Korea, Indonesia, Taiwan, Thailand and Malaysia) have recently seen a dramatic increase in emissions due to the increase in industrial production and the case of North Korea, which is difficult to define.

Finally, Brazil and Argentina, like the majority of Latin American and Caribbean countries, have made significant gains in the limitation of GHG emissions

especially between the '70s and '90s, through the use of "clean" sources rather than high emitting sources in energy production, largely by replacing petroleum derivatives with natural gas and hydroelectric energy.⁷²

Nevertheless, the difference in the magnitude of GHG emissions in absolute terms is only one of the heterogeneity issues. Other issues include; inclusion in the international agreement, the ownership identity of these countries, the disparate levels of development, cultural aspects, political priorities, the resource base and environmental agenda. Some crucial problems are shared, but all lend themselves to profound differences, where the institutional and cultural structures, the administrative organization, the distribution of power within the society and the manner of approaching and resolving major problems is so different that it resists the usual approach of various multilateral organizations of a "one size coat" to resolve the problems of the developing countries.

Sustainability and its connection to UNFCCC objectives

The motives which led to the creation of Agenda 21 are linked not only to the worsening of ecosystems on a global scale (and especially in developing countries), but also, and more importantly, to the disparities that exist between the different Nations (and within the same), to those matters that are referred to generally as social problems. Some of the more obvious are: poverty, hunger, disease, illiteracy and inequality in the distribution of wealth. As these situations have clearly worsened in the last ten years, it is reasonable to conclude that interest in and fulfillment of the proposals brought forth in Agenda 21⁷³ take on a greater importance today than they had when they were first written.

In order to achieve these objectives, the various States decided to join forces, making a commitment to do everything possible in order to attain sustainable development. At this time, it was understood that in order to reach this goal, the approach should go beyond the environment and include social problems.

The Agenda is an ambitious document with a long list of aspects related to sustainability,⁷⁴ encompassing issues that are most urgent for developing countries, many of which may still be considered "pending matters." Similarly, although the document set forth many objectives related to the problem of the global environment, very few of these have been adequately resolved in the ten years since their creation.

Latin America and the Caribbean is one of the regions that presents good opportunities for climate change mitigation as it has reached a certain level of economic and technological development. However, poverty and marginalization has become a scourge of growing importance.

The United Nations Economic Commission for Latin American and the Caribbean—ECLAC—(CEPAL, in Spanish)⁷⁵ recently published information reporting that in Latin America and the Caribbean, the total number of persons living under the poverty line⁷⁶ for the year 2000 had reached 211.4 million. It is important to note that included within this total are people who were considered to be below the line of destitution. The number of destitute in the same year had risen to 89.4 million people. The percentage of the poor population of Latin America and the Caribbean for the year 2000 was 43.8 per cent, while the percentage of destitute had risen to 18.5 per cent.

In the two decades since 1980, the number of poor people has increased by 56 per cent, and during the 90s by six per cent in spite of the objectives set forth in Rio '92. Meanwhile, urban poverty has increased by 113 per cent and destitution by 43 per cent in less than 20 years.⁷⁷

This situation has become a generalized phenomenon in the area and is aggravated by the economic policies implemented during the 90s. Poverty has become a major problem even in those countries in which traditionally it had been a marginal phenomenon.

The above mentioned figures speak for themselves on the need for eradicating poverty, and on the limited advances which have been achieved so far in public policies geared towards these ends in Latin America and the Caribbean. To this effect, a priority objective of the developing countries is to follow a path of development that will create equal opportunities for all of their inhabitants.

One of the main objectives in the search for sustainable development is the reduction of poverty. UNFCCC and sustainable development objectives should be combined within this framework of policies in such a way that climate control mitigation contributions be a global co-beneficiary of national development policies. The goal would be to make more viable the adoption of a firmer commitment to climate change mitigation by developing countries. Any mitigation options that require the funneling of

resources away from social policies would have little political viability in the countries of the region and would potentially create a conflict with other dimensions of sustainable development.

Under these conditions, it is reasonable to conclude that climate change would be excluded from the list of priorities of developing countries if these governments are to dedicate their limited resources (economic, human, financial, etc.) to the promotion of development programs with social and equity objectives, particularly after decades in which poverty and inequality have deepened in many regions of the planet. This priority and urgency to focus on other types of problems explain why developing countries in general still show limited political commitment to climate change, and that in many countries it is not even part of the political agenda.

On the other hand, it is not likely that climate change mitigation could act as a catalyst for development policies or even become a policy itself. Only in the framework of more general development policy could mitigation policy become part of sectoral policies. Even when considering climate change mitigation as a component of environmental policy, concrete actions should be combined with concrete sectoral policy.

Development policy and climate change mitigation

The main difficulty in effective implementation of climate change mitigation actions in developing countries is due to the absence of an overall sustainable development policy. There is no doubt that the absence of development policy as active State policy is linked to the paradigm that has dominated political thinking in recent decades.

Certainly, in Latin America and the Caribbean during the previous decade, a process of State reform has developed which implied that a significant part of its responsibility in development policies in the market would be delegated to the market itself. The market has come to the fore as an allocator of resources, while the process of decentralized decisions as an instrument of growth coupled with the transference to the private sector of an important part of the State's productive capacity (used to implement policy in the past), is greatly responsible for the noticeable absence of active public policy in the countries of this region.

This delegation of responsibilities, together with the repeated adjustment policies implemented in the

region, and the ongoing downsizing of the state, have impacted on the capacity of the state itself to design and implement aggregate and sectoral development policy.

In the actual decentralization and opening processes the promotion of the greater role for the third sector—NGO's, consumer associations and greater citizen participation are frequently set forth as virtues of the democratic process. In fact, they are often an example of the withdrawal of the State and its intention to divest itself of its own responsibilities.

It is contradictory, on the one hand, to demand actions that would preserve a global sharing of common property and to expect governments to act on this, while on the other hand, to discuss and take concrete steps towards decentralizing resource allocation processes and to promote decisions made to benefit individuals, which the state disregards. This illogical situation has become an almost insurmountable obstacle to the fulfillment of Convention objectives.

Final comments

There are at least two reasons why the rationale that developing countries should assume voluntary commitments merits deeper analysis:

- (a) The priority for developing countries is that Agenda 21 be put into practice in order to face the challenges of sustainable development, especially with respect to economic development and mitigation of poverty. In the current context, developing countries are not in a position to take on environmental conditions (quantified mitigation commitments) in addition to economic (structural adjustment) and political conditions (guarantees of stable democracy and management of the system in the face of internal and external pressures) that constitute both a threat and a challenge to their very existence. Obligating them to do so would distort the meaning of the principle of "common but differentiated commitments" specifically based on responsibility and equality.
- (b) This discussion means focusing attention on more important debates such as the demonstration of developing countries' effective mitigation efforts and the implementation of actions that manifest their active leadership in the fight to prevent climate change by adopting adequate internal policies.

However, before imposing major commitments on Non-Annex I countries (without distinguishing

among the different national circumstances faced by each and their level of responsibility), several matters must be considered:

- Vulnerability to the effects of climate change is greater when the means to face them is lesser. These means include not only economic resources but also infrastructure and institutional frameworks. To this effect, the policies of international credit organizations are often in conflict with “friendly” resources from the climate change perspective.
- Developing countries not only have development as a priority, but they also need to deal with adaptation to climate variability (short term) more so than climate change (long term) itself. Not only are they the most affected and most vulnerable to climate change impacts due to their lesser capacity to deal with the expected effects, they are also in the worst situation in terms of facing the process of globalization. To this effect, the process of globalization will surely make developing countries even more vulnerable since they will benefit the least from this process.
- Developing countries are persistently being asked to assume quantified mitigation commitments while countries that have already assumed them are not meeting their commitments, and, in the case of the largest source of emissions in the world, will not ratify the Kyoto Protocol. The Annex I parties should not only meet their mitigation commitments but also their adaptation assistance commitments to developing countries to reduce their vulnerability to climate change.
- Annex I parties must recognize the past emission reduction efforts of many developing countries despite their political, institutional, social, and economic weaknesses. If there were an appropriate consideration of the efforts made by some of these countries despite their limited resources, it may turn out that their effort is proportionally superior to the efforts of many of the Annex I countries, especially those of the United States.
- It is unlikely that the problem of climate change will be included as a priority in the political agenda of developing countries if the quality of life in these countries is not improved. It is also contradictory to try to narrow the “climate change commitment gap” between Annex I and Non-Annex I countries when the “development gap” between Annex I countries and the majority of Non-Annex I countries continues to widen.
- Since the majority of emissions are concentrated among a few parties, perhaps it would be much more cost-effective to concentrate on implementing measures for the principal emission producers before continuing to distribute commitments to other countries. The majority of these countries are not historically responsible for the phenomenon nor do they emit a magnitude of emissions that would justify a strict limitation.
- Latin America’s case is very significant. It is one of the regions where there has been greater effort made to take measures conducive to reducing GHG emissions in the energy sector by means of diverse policies, measures, and actions. Nevertheless, this effort may be neutralized by the increase in poverty indicators in the region. In some cases, these poverty indicators are intimately linked to the processes of foreign debt suffered by these countries in the ’70s and ’80s. In some countries, a significant part of this debt is related to infrastructure works that, along with other factors, made a significant contribution to the limitation of GHG emissions in the region. This paradox of contributing to climate change mitigation to the country’s own detriment on two fronts is created by the fact that past efforts now become part of the baseline against which future projects are compared through a “perverse” logic of international negotiation around climate change. The main advantages go to the major emissions producers (be they Annex I or not) and those who met their commitments ahead of the others are at a disadvantage in comparison to those who have delayed their mitigation measures.

Endnotes

- 1 This article deals primarily with the situation and experience of Argentina, which although not entirely comparable to the rest of the developing countries, does share some common ground, especially with other Latin American countries.
- 2 Among others: (1) the international socioeconomic context and the tie-in of developing countries to the aforementioned context; (2) policies, decisions, and actions developed by Annex I for the actual fulfillment of its obligations; and (3) the treatment and incorporation, in the international negotiation process and in unilateral actions, of ethics and economic and political equity.
- 3 Among these are some characteristics common to those in the Non-Annex I group and characteristics specific to each country or region. These are linked to national circumstances but also to potential implications and effects of mitigation policies and measures, which should be included in the analysis: (1) long-term development priorities, (2) international policy objectives and priorities, (3) analysis approach and co-benefits (local co-benefits to mitigate climate change or co-benefit regarding climate change by establishing an adequate socioeconomic development process?), (4) relative importance of resources and efforts aimed at climate change compared to those aimed at development priorities, (5) inter and intragenerational equity, (6) determination of actual benefits which the majority of developing countries might obtain through the Kyoto mechanisms, (7) matters relating to the baseline, additionality, and the logic of the mechanisms, (8) uncertainty related to political and economic instability, (9) the true magnitude of the potential contribution to mitigation, and (10) the need to develop serious and “in-depth” studies to identify viable options.
- 4 See Bouille and Girardin (2002).
- 5 For additional details see Bouille and Girardin (2002).
- 6 The matter of voluntary commitments for developing countries had already been raised by the United States, very specifically, in a position paper presented in 1996, and later on, by requiring a “significant commitment” from developing countries with respect to climate change mitigation at several forums. See FCCC/AGMB/1996/MISC.2/Add. 2 and 4, where it is specified that “...the Parties shall adopt, in (2005), binding provisions so that all Parties have quantitative obligations for greenhouse gas emissions...” New Zealand also raised a fitting proposal requesting that all Parties be committed. As well, during COP-4, developing countries vehemently confronted the United States for its attempt to impose voluntary commitments upon them.
- 7 In spite of the official announcement by Argentina during COP-4, during negotiations prior to COP-3, the Argentine delegation had declared itself in favour of promoting the inclusion in the Protocol of a voluntary commitment for those developing countries that wished to adopt it. Argentina explored this alternative, leading a consultation group made up of other Latin American countries, during the development of the AGBM7. However, these consultations about a possible new proposal failed to produce concrete results. The preliminary version of the text of “Article 10,” which had the support of the Argentine Delegation, did not obtain the necessary consensus, as the G-77 countries and China declared that this commitment was unacceptable for the group. See Bouille and Girardin (2002).
- 8 The proposal to include voluntary commitments in the discussion was revisited at COP-4, although, in the end, it was not included in the previous agenda. In the meantime, at the meetings prior to the Conference, the G-77 and China announced that the Group did not approve the inclusion of the Voluntary Commitments item in the provisional Agenda proposed for the meeting. Despite all this, the chair of the Conference suggested the inclusion of the voluntary commitments of the developing countries in the agenda for the meeting resulting in the immediate rejection by G-77 and China. See Bouille and Girardin (2002).
- 9 For additional details on Argentina’s emissions goals see Bouille and Girardin (2000) and Florin (2000).
- 10 At The same conference, the representative for Kazakhstan announced his country’s wish to voluntarily join the Annex B Group. The proposal was received unenthusiastically, but with reservations, from Annex B and with opposition from G-77 and China. Similarly, some United States NGO’s proposed the formation of an Annex C through which some former USSR countries such as Armenia, Azerbaijan, Georgia, Moldavia, Turkmenistan, and Uzbekistan could assume voluntary commitments. See Zalayova and Michaelowa (2000).
- 11 Before COP-4 there were unofficial declarations about the possibility that other Non-Annex I countries (such as Mexico and South Korea, both OECD members) might assume voluntary commitments. At a diplomatic meeting with Japanese representatives, South Korea stated that it was disposed to announce voluntary reductions of greenhouse gases for 2018. It was the first Non-Annex I country to make this type of declaration, although it was never made official at a COP. See CSE (1998).
- 12 Bouille and Girardin (2002).
- 13 Zalayova and Michaelowa (2000).
- 14 *Ibidem*.
- 15 Baumert *et al.* (2000).
- 16 Samaniego and Figueres (2002).
- 17 Kim and Baumert (2002).
- 18 Winkler *et al.* (2002).
- 19 Bouille and Girardin (2002).
- 20 La Rovere *et al.* (2002).
- 21 Samaniego and Figueres (2002).
- 22 Kim and Baumert (2002).
- 23 Aslam (2002).
- 24 Criqui and Kouvaritakis (1997), Gobierno de la Republica Argentina (1999).
- 25 Some authors and forums have suggested that the real participation of the Non-Annex I required by the United States Congress has already been met due to the full adherence of developing countries in the CDM and the Kyoto Protocol. Bhandari (2002).

- 26 Biagini *et al.* (2000); Bouille, Girardin and Di Sbroiavacca (2000); Diaz de Hasson, Suarez and Pistonesi (1994); Girardin (2000); Rosa and Dos Santos (1996); Suarez (1995, 1996 and 1999).
- 27 Biagini *et al.* (2000).
- 28 Reid and Goldemberg (1998).
- 29 Biagini *et al.* (2000).
- 30 Suarez (1995), (1996) y (2000).
- 31 Suarez (1995) y (1999).
- 32 Baumert *et al.* (1999).
- 33 Ibidem.
- 34 Suarez (1995), (1996) and (1999); Biagini *et al.* (2000); Bouille, Girardin and Di Sbroiavacca (2000); Diaz de Hasson, Suarez and Pistonesi (1994); Girardin (2000); Rosa and Dos Santos (1996).
- 35 In that sense, in terms of its magnitudes and costs, the fact of delay measures and actions would allow those countries to get better conditions to show more attractive “emission reduction options.” Those countries that take “early actions” surely are exhausting their lower cost opportunities for reducing GHG emissions, which are also the more attractive ones.
- 36 For costs for countries like Argentina, see Gobierno de la Republica Argentina (1999) and Girardin (2000).
- 37 See Mit (1997), Zhang (2000) and (2001); and for the Argentine case see Girardin (2000) and Gobierno de la Republica Argentina (1999).
- 38 For more details see Baumert *et al.* (1999) and Baumert *et al.* (2002).
- 39 Ibidem. For the Argentine case see Bouille and Girardin (2002).
- 40 Baumert *et al.* (1999).
- 41 See Petrella (2001), who also states that: “(...) technology and science as well as the dematerialization of the economy and the human condition under the effect of information and communication technology, have accelerated the establishment of the financial economy. The saturation crisis of the western economy which favoured and justified the strength of the Market, Business, and Capital and liberalization, deregulation, and privatization (...)”
- 42 “Development is a global process, and only for methodological convenience, or in a partial sense, is it possible to speak of economic, political, cultural and social development. (...) In reality, all social processes correlate structurally, and it is certainly true that they unfold in plans that have some degree of autonomy (economic, in the strict social sense, cultural, and political). Another important truth is that that these areas can be understood independent of the social global process only in the abstract”; in Jaguaribe, H. Desarrollo Económico y Desarrollo Político, quoted in Fernandez (2003).
- 43 Sachs (2001).
- 44 “It is unlikely that poor countries will be able to develop intensive agricultural production or industry unless they are given the right to increase the consumption of fossil fuels which are the main source of greenhouse gas emissions. It would also be unfair, at this time, to deny the poorest nations the right to use the cheapest sources of energy because the use of these same sources in the past (primarily by the currently most opulent nations) has already exhausted the natural capacity of the planet to absorb such emissions without causing grave climatic imbalances. The new panacea of the sustainable development model is being touted by countries that really do not want to change the current development model. They affirm that this sustainable development model will ensure fairness and environmental stability but they remain committed to an unfair and environmentally unstable development process which does not require them to make any substantial changes. In this way, they position themselves to an unfair and environmentally unsustainable development process.” Fernandez (2003).
- 45 IPCC (1998).
- 46 “The vulnerability to Climate change is closely related to the capacity to absorb, cushion, and/or mitigate the effects of events that are out of the ordinary and to the magnitude of these events. (...) With respect to countries this capacity is linked to the existence of a certain level of technology, infrastructure, and economic and financial means to deal with it.” Girardin (2000).
- 47 See Olmos (2001), Kates (2000), Lorenzoni *et al.* (2000), Sharma and Kumar (1998) and Kandlikar and Sagar (1999).
- 48 See Olmos (2001) and O’Brien and Leichenko (2000).
- 49 See SUAREZ (1995); Diaz de Hasson, Suarez and Pistonesi (1994).
- 50 Lipietz (1995) and Girardin (2000).
- 51 In the case of developed countries, the strongest opposition to implementing emission reduction efforts generally comes from countries whose economic structure has as principal productive activities those which are dependent on the use and production of fossil fuels. This became clear, in terms of the industries involved, through the strong lobby that the representatives of the petroleum and auto industry, mainly from the US, exercised at the COP-3 in an attempt to stop the signing of agreements on significant immediate reductions. This characterization is not exclusive to any particular country, as there could also be other obstructionist countries with different motives. Even so, a large number of the developed countries that support this position are included in the self-named “Umbrella Group.” Given that greater dependency on fossil fuels implies a direct relation between the behaviour of economic activity and GHG emissions, it may be assumed that repercussions of mitigation measures to be adopted could have a strong effect on the economy. Keeping in mind also that for various reasons, developed countries are less vulnerable to the projected effects of climate change than developing countries [See IPCC (1998); WRI (1998)], the argument used to delay the completion of commitment to mitigation agreements is that the reduction of GHG emissions is very expensive and not effective when compared to the effects that may be suffered. See Girardin (2000).
- 52 On the other hand, within the same group of Annex I countries, the dominant position on taking measures to reduce the above-mentioned emissions, is linked to countries whose

- long-term competition strategy policies are based on the possibility of increased efficiency in energy use and generation and in the eventual benefit of this situation, in countries with economic structures which are more dependent on fossil fuels. This is, on the whole, the position of the European Union. See Girardin (2000).
- 53 In the case of developing countries, the obstructionist position is based on the subordination of all possible precautionary domestic climate change strategy on the actions taken previously by developed countries. The argument put forward is that those who are responsible for the current situation are the ones who should demonstrate that they are prepared to comply with the mitigation effort before requiring commitments from developing countries. Reducing emissions is not only seen as unjust, but also as a burden that affects chances for development. Taking the contrary position are those developing countries who see themselves as more vulnerable to climate change (for varying reasons that range from the possibility of extinction due to rising sea levels, to their dependence on non-irrigated agriculture), others which have low per capita, specific and total emissions levels and that believe they can profit from the situation by participating in cooperation mechanisms in the implementation of the Kyoto Protocol, those which have important forest reserves and therefore, significant capacity for the absorption of CO₂; and those that consider that they have a wide margin of error for the application of energy efficiency measures and low levels of emissions per unit of product. See Girardin (2000).
- 54 These figures include only CO₂ emissions resulting from the burning of fossil fuels for energy use, and do not take into account emissions of this or other gasses originating from other sources. Emissions resulting from the burning of fossil fuels are the figures that present the lowest margin of error in emission factors used as well as in the availability and reliability of the data.
- 55 In this case, the absolute value of emissions is taken into consideration because it is the method used to determine the current commitments (Annex I of the UNFCCC, Annex B of the Kyoto Protocol). If other indicators, such as emissions per capita, emissions intensity with regard to GDP or energy sector emissions were taken, this analysis would have to be greatly expanded.
- 56 Using a reference point previous to the EIT crisis.
- 57 Please note that China still has not reached the historic levels of emissions of the former USSR.
- 58 Including the United Kingdom, Canada, Korea, Italy, France, Mexico, Australia, Brazil, Ukraine, South Africa, Poland, Iran, Spain, Indonesia and Saudi Arabia. The remaining countries that follow in order are responsible for less than one per cent of total emissions.
- 59 Obviously, the same may be said of the majority of countries not included in this graph. The clearest exceptions to this rule are, again, the EIT countries not included among the 34 countries shown here and countries which have been experiencing war (the decrease in GHG emissions is very noticeable in Balkan Countries at the end of the 90s, a majority of which were in full scale war during that time. The same pattern occurred in Iraq during the period of the "Gulf War"). See Girardin (2000). In the European Union, besides the three countries already mentioned, Finland, Luxemburg and Sweden also show decreased emissions in comparison with 1990 levels. See Gugele *et al.* (2002)
- 60 It is worth noting that, during the course of COP-5, Turkey was authorized to leave Annex I of the UNFCCC (in fact, it was not included in Annex B of the Kyoto Protocol); at the same time, Kazakhstan's entry into Annex I was not authorized.
- 61 The previously mentioned countries as well as Poland, Mexico, South Africa, South Korea, Australia, Brazil, Spain, Iran, Saudi Arabia and Indonesia.
- 62 For more on the topic of the permanence of CO₂ emissions in the atmosphere, see IPCC 1996a, p. 121.
- 63 See Bhaskar (1995), Martin (1990), Rosa (1998) and Rosa and Ribeiro (1997a). It is important to keep in mind that emissions from developed countries have increased since 1990, except in the case of the EIT and six European countries. According to data recorded in Rosa (1998) and Rosa and Ribeiro (1997a), North American emissions (excluding Mexico) for 1990–1996 represent 3.7 times the absolute value of the whole of Latin American emissions.
- 64 This is the case for the majority of developing countries. China and India are possible exceptions to this but it should be noted that they both have very low per capita CO₂ levels.
- 65 See footnote 14.
- 66 From an ethical point of view (all human beings have equal rights to the common property of all humanity, in this case, the atmosphere's service in the absorption of CO₂) as well as from an economic point of view (those responsible for generating a negative externalization should be responsible for remedying the situation before it becomes irreversible and those who have abused the patrimony should compensate the other owners for this situation).
- 67 United Nations (1993), based on IPCC studies.
- 68 See footnote 58. Uzbekistan was part of the former USSR.
- 69 South Africa's case is similar. Although it does not belong to Annex I or Annex B, it still appears in some international publications classified as a Developed Country. See PNUD (1995).
- 70 Nevertheless, China shows a notable decrease in emission intensity (kg of CO₂/GDP), mainly since the end of the 70s, which by the end of the 90s put them at average world levels. The rest of the Asian countries show a moderate, although sustained increase in this variable. They still maintain levels lower than the world average, as does Africa. See IEA (1999).
- 71 Argentina may be added to this list, although obviously at a different magnitude. However, in the past few years their production and exportation of fuels has heavily increased and the emissions associated with these sectors has increased as a consequence. See SRNyDS (1999a) and SRNyDS (1999b).
- 72 See Bouille, Girardin and Di Sbrojavacca (2000), Diaz de Hasson, Suarez and Pistonesi (1995), Suarez (1995); Suarez (1996), Suarez (1999) and Rosa and dos Santos (1996).
- 73 The principle objectives of Agenda 21 are: (a) integrate environmental and developmental problems, (b) satisfy basic

needs, (c) obtain greater protection and management of ecosystems, (d) attain a more secure and prosperous future that all Nations work together to achieve. See United Nations Division for Sustainable Development (2000).

- 74 Among them are: the fight against poverty, the promotion of environmentally compatible consumer habits capable of satisfying social needs, achievement of an adequately dynamic demographic, the protection and encouragement of human health, the integration of the environment and development in decision-making, an integrated focus on the planning and management of natural resources, the adoption of measures against deforestation, desertification and drought, the conservation of biological diversity, the protection of oceans, seas and costal zones, as well as the protection, rational utilization and development of its living resources, the protection of the quality and supply of fresh water resources, the ecologically rational management/ handling of toxic chemical products, dangerous wastes, solid wastes and radioactive wastes, the

taking of measures at a global level in favour of women, children and youth, the strengthening of the role of Non-Governmental Organizations and of workers and their unions, the strengthening of the role of commerce, industry, agriculture, the transference, cooperation and increase in technological capacity, the promotion of science for sustainable development and the encouragement of education, training and awareness. United Nations Division for Sustainable Development (2000).

- 75 CEPAL (2002), Table 1.3. page 38.
- 76 In accordance with the definitions utilized, poverty is the inability to access the minimum basic necessities within one's own country or region, and destitute is the term for someone who can not access the most basic quantities of nourishment needed before body mass is consumed. CEPAL (2000).
- 77 The increase in urban poverty is notable, and is a phenomenon of the area. See CEPAL (2002).

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