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Economic Commission for Latin America and the Caribbean

ECONOMIC CRISIS AND ENVIRONMENT IN LATIN AMERICA  
AND THE CARIBBEAN

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## INTRODUCTION

This document is a condensed, revised and updated version of a report submitted by the UNEP Regional Office for Latin America and the Caribbean (ORPALC) to the meeting of high-level experts appointed by the governments of the region to discuss regional co-operation on environmental matters, held in Brasilia from 27 to 29 March 1989.\*/

ECLAC was asked by ORPALC to prepare the above-mentioned report --entitled "Crisis, external debt, macroeconomic policies and their relation to the environment in Latin America and the Caribbean"-- as one of the outputs of the joint ECLAC/UNEP project entitled "Technical co-operation for integration of environmental considerations in development planning in Latin America and the Caribbean" (FP/9101-87-93) being carried out by ECLAC through the Joint ECLAC/UNEP Development and Environment Unit.\*\*/

The first part of the document discusses the external debt, the economic crisis that resulted from it and the economic adjustment programmes undertaken by governments to deal with it. The second part describes the environmental effects of these adjustment policies; it also contains an annexed diagrammatical synopsis showing the relationships among adjustment policies, policy instruments and immediate actions associated with them, together with the resultant environmental deterioration processes and their potential effects. The second part also includes some comments about specific effects on the output of sectors related to the exploitation of natural resources, and about the impact on the social environment. The third part contains a series of final considerations and sets forth some preliminary conclusions.

The work is primarily based on the bibliographical references listed in the fourth part of the document, and on a study of the specific cases of certain countries of the region.

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\*/ UNEP: United Nations Environment Programme.

\*\*/ ECLAC: Economic Commission for Latin America and the Caribbean.

The main conclusion of this paper is that the evolution of "added" deterioration --in the sense of including all the environmental deterioration processes relevant to the region-- is based on the styles of development that prevailed long before the current economic crisis, and that what this crisis and the resultant adjustment policies have done is to bring about a "reallocation of deterioration" on the medium and long term.

On the short term, the most evident effect of the adjustment programmes has been to worsen the incidence of certain social problems associated with poverty --with a consequential impact on the urban and marginal rural environments-- and/or to reverse the positive trends prevailing in some of them before the crisis. There have been direct results of certain clearly defined policies --for example, cuts in social spending-- and also indirect results of other policies whose direct effects have included the downturn of urban industrial activity and rising inflation.

On the short and medium term, fiscal budget constraints have probably brought about damage to protected ecosystems and, pollution of the physical environment because of cuts in the relevant items of expenditure; however, this hypothesis has not yet been verified.

On the medium and long term, it is expected that there will be a deterioration of those natural resources being exploited in connection with economic activities oriented towards export markets. Favourable conditions for such activities have been created in a context characterized by a lack of standards for protection of resources and the environment, and/or by a certain tolerance towards the violation of existing regulations.

## I. EXTERNAL DEBT, ECONOMIC CRISIS AND ADJUSTMENT POLICIES \*/

### A. EXTERNAL DEBT AND ECONOMIC CRISIS

During the 1970s, in a process encouraged by the enhanced international liquidity that resulted from the sharp increases in oil prices, the countries of Latin America and the Caribbean, together with other developing countries in Africa, Asia and Europe, considerably augmented their external indebtedness. Net inflow of capital was such that it not only allowed total payment of debt servicing, but also provided financing of imports at values much higher than those of exports. These positive net flows were not matched, in a time frame consistent with that of debt servicing, by enough investment to expand the net availability of foreign exchange to confront such servicing.

At the end of the 1970s, the pattern of excessive indebtedness had already been set in a context of world recession caused by the developed countries' anti-inflationary policies in response to the 1979 hike in oil prices; the deterioration of external demand and the terms of trade, which had been evident for some years, coincided with a sharp fall in net capital inflow, a significant rise in external debt interest rates --and, as a consequence, in servicing payments-- and an increase in net payments of profits abroad.

The economic crisis began to be felt in Latin America and the Caribbean in 1981. It was not until August 1982, however, when Mexico announced that it could not continue meeting its international financial commitments, that the world became aware of the problem. That date marks the beginning of the crisis, which was viewed at the outset as an isolated case of temporary lack of liquidity but which rapidly spread to most of the developing world.

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\*/ The numbers between parentheses throughout the text correspond to the bibliographical references listed in chapter IV.

Following Mexico's announcement in 1982, the international financial community greatly reduced the amount of medium-term funds available to the developing countries. Thus, a voluntary element of importance in explaining the drop in net inflow of capital was introduced. This reduction even affected some countries, such as Colombia, that were not facing payment difficulties, did not have macroeconomic imbalances and had not accumulated debt at a rapid pace.

The following figures show the evolution of total external debt payments disbursed in Latin America, according to ECLAC: (2)

Year	Amount	Annual growth	
	US\$ (in millions)	Period	%
1983	352 183	1979/81	23.3
1984	369 848	1982/83	11.0
1985	376 667	1984/86	3.4
1986	389 336	1986/87	5.4
1987	410 505	1987/88	-2.2
1988	401 360		

It can be seen that, once the economic crisis broke out, the growth rate of external debt payments —which was very high until 1981— gradually declined, becoming negative in 1988, when for the first time the absolute value of external debt declined, by slightly over US\$9 billion. (2)

The crisis became generalized and affected countries with relatively more highly developed economies as well as those with poor economies; countries that applied interventionist strategies and policies aimed at the domestic market as well as those that followed strategies of greater openness to foreign trade and developed market economies; oil-exporting countries as well as economies dependent on imports for their fuel supply.

In every case there was a tendency to oversimplify explanations of the external debt crisis; a great deal of uniformity in behaviour among the countries of Latin America and the Caribbean has been implicitly assumed. However, although there were elements in common, the influence of factors specific to each country produced crucial differences between countries. ECLAC has pointed out that, while the origin and the development of the debt crisis have been affected by a multiplicity of internal factors, both

structural and situational, and both economic and socio-political, the influence of external factors has been decisive.

The concrete manifestation of the crisis was a current account deficit which came to represent 40% of regional exports in 1982 and totalled more than US\$40 billion, most of which could no longer be financed by transfers from abroad but had to be dealt with by depleting international reserves. (1)

Until 1981, the balance of the flow of resources to the region was favourable; net inflows of capital widely surpassed net payments of profits and interests abroad. From 1982 onwards, however, the transfer of resources began to move in the other direction, generating the aforementioned deficit.

The following figures show the net capital inflows and transfer of resources thus far this decade (in billions of US\$): (2)

Year	Net capital inflows (A)	Net payments of profits and interest (B)	Transfers of resources (A - B)
1980	29.7	18.1	11.6
1981	37.6	27.2	10.4
1982	20.2	38.8	-18.6
1983	2.9	34.4	31.5
1984	10.3	37.0	-26.7
1985	2.2	35.0	-32.8
1986	8.3	31.9	-23.6
1987	13.9	30.5	-16.6
1988	4.3	33.2	-28.9

The external imbalance, alone or in conjunction with various other factors, resulted in domestic imbalances. To deal with both of these, especially the huge current account deficit that could no longer be financed through foreign loans or investments --at least not long enough to produce a net inflow into the country-- forced the governments to design and implement more or less severe adjustment programmes whose recessive or inflationary effects have been very serious.

In the region as a whole, the effects consisted of a sharp drop in the growth rate of the gross domestic product in 1981, a decrease in 1982 in absolute terms --unheard of in the past 40 years-- and an even greater decline in 1983. Beginning in 1984, the gross domestic product began to

recover, but never reached the cumulative annual growth rates of the years prior to 1981; in terms of annual growth rates, the downward trend began in 1987. The slump in economic activity contributed to increased unemployment, underemployment and marginality. Real wages dropped, and food, health and housing conditions deteriorated.

The annual cumulative growth rates of the total and per capita gross domestic product are shown below. (1) (2)

<u>Year/period</u>	<u>Total GDP (%)</u>	<u>Per capita GDP (%)</u>
1970-1980	5.5	3.0
1980	6.1	3.6
1981	0.6	-1.6
1982	-1.2	-3.5
1983	-2.6	-4.7
1984	3.7	1.4
1985	3.6	1.4
1986	3.9	1.6
1987	2.5	0.3
1988	0.7	-1.5

The region as a whole has been able to significantly reduce its external deficit with extraordinary speed, which has been quite a bit easier than controlling inflation (which, on the contrary, accelerated). The current account deficit, which as noted above represented 40% of exports in 1982, dropped to 7% in 1983 and practically to zero in 1984, although it began to grow again in 1985. (1)

This result was achieved at the cost of a drop in the per capita product of nearly 9.5% in 1983 compared to 1980 (which was still 6.4% lower in 1988 than in 1980), a sharp increase in unemployment, a decline of more than 20% in investment and a rise in the annual inflation rate to nearly 300% in 1985 and to over 470% in 1988. (14) (2)

## B. ADJUSTMENT POLICIES

The exchange rate has been one of the most important macroeconomic policy tools in the adjustment process, in its role as the principal regulator of foreign trade. The countries notably devalued their nominal exchange rates by stages until, in 1987, they reached a real rate that was above those prevailing before the crisis. Corrections in the exchange rate encouraged productive export-oriented and import substitution activities.

These devaluations, encouraged inflationary processes, however, and it would appear, in retrospect that more importance should have been given to the stabilization component of the programmes under way.

To a certain extent, the role that the exchange rate began to play in trade minimized, the function of trade policy tools aimed primarily at complementing the effects of the exchange policy, particularly in reference to exports. Bureaucratic red tape was reduced, as were tariffs and quasi-tariff measures.

Both exchange rate and trade policy provided the means for making considerable reductions in imports and increases in volumes exported. Nevertheless, the anticipated effect of the exchange rate policy on the relative price structure of tradeable and non-tradeable goods was only partially achieved in the short term. The devaluations coincided with a sharp and sustained fall in the international prices of the main products exported by the region, and increased inflation offset a large part of the policy's effects.

The general trend in price controls —especially those for products of the agricultural sector— was to free them, thereby reducing the role of government administration and at the same time strengthening the participation of the private sector in the marketing of farm products. Where prices continued to be administered by government authorities, the increase in the cost of imported inputs used in farm production and the higher prices of imported foods argued for adjustment.

Monetary policy, like exchange policy, became one of the principal factors in macroeconomic management during the adjustment period, specifically in reducing aggregate demand.

In most countries the adjustment process led to considerable reductions in lending and, in many cases, subsidized interest rates were also

eliminated. Official lending to agriculture was cut back appreciably from 1983 onwards, and there was a concomitant reduction or elimination of subsidies, both of which were components of compensatory, pre-crisis policies. These policies had been designed to improve the relative position of agriculture, which had been discriminated against by the prevailing economic policies and their promotion of an urban-industrial model of development.

Public spending was drastically reduced and at the same time underwent changes in its composition; this had a strong impact on the economies where the weight of the fiscal sector was heaviest, and on the sectors of the economy where the State's role was most significant. In some countries, public expenditure dropped in real terms; the cuts were focused on public investment and the remuneration of civil servants. Most of the negative impact was felt in the overall process of productive investment, in the general level of economic activity and in the social components of public spending.

In any case, in certain countries, efforts to reduce public spending were partially neutralized by the increases in interest payments on the foreign and domestic debt resulting from the devaluations dictated by stabilization programmes and the deliberate policy of raising domestic interest rates to curtail aggregate spending.

Nevertheless, the fiscal deficits of the group of major borrowers grew in relation to the pre-crisis period, mainly because government revenues were also reduced by the recession that followed the crisis and because of the effect on fiscal accounts of increased domestic debt interest rates

The wage policy was also linked to the objective of cutting back aggregate demand. Real wages fell as a result of the declines in revenue and domestic spending, which were in turn due to the deterioration of the terms of trade, higher interest rates, reduction or elimination of external financing and inefficient adjustment policies. Furthermore, there were deliberate wage cuts in some countries.

## II. ENVIRONMENTAL EFFECTS OF ADJUSTMENT POLICIES \*/

### A. EXPENDITURE REDUCTION POLICIES

These policies, which are basically aimed at reducing aggregate demand, are expressed through a set of fiscal and monetary measures. Fiscal measures, including cutbacks in current spending, increased taxes (which are generally demonetized) and a reduction in public investment (which is assumed to encourage private investment), have negative multiplier effects on aggregate demand, whose reduction, in turn, brings about a drop in production. Monetary measures, including cutbacks in domestic credit and money supply, lead to reductions in investment and have negative effects on aggregate demand, and ultimately on capital formation. In brief, expenditure reduction policies affect GDP growth in the short term and possibly in the medium term as well.

Budget cuts and consequent cutbacks in government spending have affected institutional expenditure items for goals that were of low economic priority in the view of national authorities.

In this regard, the items most affected have been those linked to the social component of public spending, supervision activities in general and production support programmes, particularly in the farm sector. Direct public investment and programmes to finance private production activities were substantially cut, especially at the outset of the adjustment period.

The environmental effects of adjustment are numerous and contradictory, making it difficult to identify the relationship between adjustment policies and damage to the natural resources associated with them. The effects of these policies on social and urban problems, however, are quite clear.

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\*/ The annexed synoptic table is a summary of this section. The table shows the relationship of adjustment policies, general goals, policy instruments and the immediate actions resulting from them, to various processes of environmental deterioration and their potential effects.

It should be noted that the major effects of aggregate demand restriction policies, from the standpoint of natural resources, occur in protected ecosystems, in ecosystems that maintain or will maintain infrastructure projects, and in waste assimilation systems.

In protected ecosystems --basically the entire national park system, reserves, nature sanctuaries and so forth-- there seems to have been greater illegal extraction of commercially valuable flora and fauna species, owing both to the lack of vigilance which resulted from reduced spending on supervisory activities. The deterioration of protected areas is one of the short-term effects of these policies.

Outbacks in current spending for controlling sectoral investment --energy generation, irrigation, road construction, mining and so forth-- have limited the sectors' capacity to conduct or contract for environmental impact studies, to negotiate and follow up on pre-investment and implementation studies for projects with environmental impact or to supervise the implementation of projects to minimize adverse environmental effects. Generally speaking, the importance of these activities has been minimized vis-à-vis other institutional needs. The environmental impact of these omissions will occur in the medium to long term.

Similar results may have occurred in environmental sanitation controls. Cuts in institutional budgets have been reflected in slackened control of industrial waste and reduced capacity of environmental sanitation service agencies to fulfil their responsibilities, which has resulted in higher levels of pollution. The adverse effects are basically short term.

Now and in the near future, reductions in public investment are and will be affecting the implementation of conservation projects linked to hydroelectric power generation and/or irrigation works, and projects to protect existing infrastructure being affected by deterioration processes in other systems --the washing down of sediments and silting up of reservoirs-- or by extreme meteorological phenomena. The adverse consequences of these omissions are of utmost significance and will be felt in the medium term as well as in the short term.

Some of the specific effects on natural resources and on the social environment will be described later.

## B. EXPENDITURE REALLOCATION POLICIES

Expenditure reallocation policies seek to transfer resources from the sector of non-tradeable to that of tradeable goods. The intention is to improve the balance of payments by cutting back on imports and increasing exports, and/or by import substitution.

The tool preferably used for such purposes has been the exchange rate; efforts have been made to increase the real value of foreign exchange through devaluation of local currencies. Devaluation ultimately leads to a change in the terms of trade between tradeable and non-tradeable goods in favour of the former. This result, while lowering imports because of their higher cost or replacement by local production, favours increased exports.

Other instruments used for this purpose have been interventions in foreign trade --usually as a complement to the exchange rate--, the fixing of prices to control inflation and various measures to stimulate the mobility of factors among sectors.

In brief, the incentive to produce tradeable goods is expected to lead to the increased exploitation of natural resources.

Although spending, together with imports, can be reduced very rapidly, the production of exportable goods and import substitutes cannot be expanded at the same rate. The mobility of factors is not perfect, and there are certain technical restrictions that limit or delay the necessarily slow reallocation process, which becomes more and more difficult as the idle capacity for producing such goods diminishes.

The margins for immediate expansion of the production of exportable goods that depend on the exploitation of natural resources, without the mobilization or reallocation of other factors of production, have been narrow. In activities with underutilized factors, or those that depended on ecosystems with little previous intervention, the conditions for expansion may have existed without prior reallocation of production factors.

Most of the region's exports, approximately 80%, are primary products, and it is difficult to place more of them on traditional markets abroad. Consequently, most export expansion has to be based on non-traditional products. Despite progress made in the 1970s, these amounted to only 4% of gross domestic product at the outset of the crisis, in a context where exports were of little significance in the region's economies, accounting for

approximately 15% of regional GDP up to and including the present decade, compared to 40% in Korea and Taiwan at the other extreme. (1) (14)

Constraints have also arisen in external markets for traditional products that require the exploitation of natural resources, many of which have been subject to quotas. Finally, export incentives have been offset in many cases by the discouraging drop in international prices.

As previously underlined in this document, the region has in fact been able to reduce its external imbalance, but more through a drastic reduction in imports than through expanded exports.

Thus, in general terms, at least until 1986, pressure to intensify the exploitation of natural resources has been neither a clear nor a uniform phenomenon. However, a certain reallocation of production factors towards such intensification could have taken place --although not yet fully expressed-- and, in the near future, substantial increases could be expected in the extraction or exploitation of resources.

### C. SPECIFIC SECTORAL EFFECTS

The following paragraphs briefly describe the effects of the adjustment on specific production sectors associated with the exploitation of natural resources. In addition, some comments are made on the social effects of adjustment.

#### 1. Agricultural subsector

For the total of a series of major regional crops --including basic grains, roots and tubers and agro-industrial crops-- the trend in the growth rate of the cultivated area has generally been consistent with the individual behaviour of each of them taken separately. This trend is also in line with the prevailing models of development prior to the crisis --designed to promote urban and industrial development-- and with the effects of the crisis and adjustment policies resulting from it which, in relative terms introduced favourable changes into the agricultural sector.

The figures show a declining rate of expansion, which was accentuated in the first phase of post-crisis adjustment (1980-1983), and improved in the following period (1983-1987). Annual aggregate rates varied within a

relatively small range; the highest rate --2.8%-- occurred from 1960 to 1970, and the lowest --1.2%-- from 1980 to 1983. This behaviour, with some exceptions, can be seen for each of the categories; however, there are significant differences in the size of the variations in terms of cumulative annual rates for the relevant periods.

On the other hand, the expansion of the agricultural area from 1980 to 1987 was a moderate 2.8%, equivalent to 0.4% cumulative annual growth, a rate which represents a drop in the historical rate of expansion of 0.7% annually. Area under annual and permanent crops expanded by 2.5% and 3.1%, respectively, while pasture-land increased by only 1.8%. Agricultural area is expanding at the expense of forests; and the area used for crop farming is growing at the expense of both forests and pasture-land (see annexed tables 3 and 4).

From an environmental standpoint, the replacement of woodlands and pasture-lands by areas under annual cultivation can be expected to lead to a series of deterioration processes; however, this situation has been developing since before the crisis.

At the same time, the assumption could be made that the ultimately deteriorating effects of the adjustment on agricultural land and forests, which may be associated with an expansion of crop-raising with a view to production for export, have not been fully felt because they have been partially offset by the opposing effects of the adjustment policies themselves; these included the growing cost of imported inputs, inflation and lower domestic demand, together with the drop in international prices and the impact of certain meteorological phenomena.

Nevertheless, since the trend is towards expansion in the principal crop-raising areas, and all indications are that export-oriented policies will prevail in future --still in a restrictive context for the environmental dimension, at least in the medium term--, it can be expected that pressures on the natural resources associated or involved with agriculture will intensify; this will have potentially adverse effects on crop-raising land, through excessive artificialization and overutilization, and on frontier ecosystems, through deforestation.

## 2. The forestry subsector

The figures on the forestry subsector, in the context of these considerations, are not conclusive. Although the increase in roundwood production, which is representative of the intensity of exploitation of forests because it includes all uses --fuelwood and industrial uses-- barely exceeded 9% in the period between 1979-1981 and 1983-1985, the production of pulp grew by 28%, which may represent a response to adjustment incentives to expand exports. However, other products expanded at lower rates.

On the other hand, annual growth rates in terms of physical volumes for production and export declined in the period between 1979-1981 and 1983-1985, compared to the period between 1961-1963 and 1979-1981, except in the case of exports of paper and paperboard. The decline in the growth rate of the value of total exports is even more marked.

Between 1980 and 1985, fuelwood and charcoal production grew by 12.6%; this represents a cumulative annual growth rate nearly equivalent to the historical rate. At the same time, exports fell abruptly.

(See annexed tables 5 and 6 for the corresponding figures.)

The figures do not present clear evidence of the deterioration of the coverage of forests as a result of adjustment policies, in view of the historical levels of extraction as compared with the rates until 1983-1985; on the other hand, the historical annual rate reduction of wooded areas --of 0.4% (see annexed table 3)-- has remained virtually constant. However, the regional aggregate may mask more specific country-level situations. The subsector has also been facing an unfavourable price situation.

Demographic pressure for fuelwood and charcoal is scarcely notable in the growth of the output of the two categories: from 1980 to 1985, the growth of the population of Latin America and the Caribbean is estimated at 11.6%, lower than the above-mentioned increase in production of fuelwood and charcoal in the same period. (1)

On the other hand, if the social conditions produced or worsened by the adjustment persist, there may be pressures on forestry resources both for fuelwood and for the expansion of crop-raising activities.

### 3. The fisheries subsector

Although the growth rates registered in the various fishing regions have differed widely, ocean catches in the subcontinent have increased substantially since 1983 (by over 16% per year), as has the production of fish meal (27.8% annually). The increase in the value of exports (5.3% annually) has been less marked, but is nonetheless significant.

(For further information on the fisheries subsector, see annexed tables 7 and 9.)

Various experiences of the recent past illustrate the dangers of over-exploiting coastal and marine resources. The western central Atlantic (according to the FAO classification),<sup>\*/</sup> where pressure on these resources has caused catches to decline, and the exploitation of anchovies in Peru, where they were over-fished to such an extent that the catch dropped to negligible levels, are two cases in point.

Everything seems to indicate that all the various forms of subsectoral production --ocean fishing, inland fisheries and aquaculture-- will continue to be encouraged and that large-capacity fleets from outside the region will continue to be active, while there are no clear signs that any meaningful steps are being taken to protect the resources in question.

### 4. The mining subsector

A number of mining resources of importance to the region (bauxite, copper, tin, iron and zinc) were examined. Aggregate output of these minerals as a group, which had been growing by 4.5% annually since 1960, showed a considerable decrease (15%) in 1983 as compared to 1980 which coincided with the crisis. However, production recovered during the period 1983-1987, marking up a cumulative annual growth rate of 7.6%, which was far higher than the historical rate of 6% recorded for the period 1960-1970.

In contrast, the rate of expansion of oil production was raised from 2.1% to 3.9% in the years immediately following the crisis, which brought it back up to the annual growth rate recorded for the 1960s. However, during

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<sup>\*/</sup> FAO: Food and Agriculture Organization of the United Nations.

the period 1983-1987 the volume of production fell in absolute terms, primarily as a result of the level of international oil prices.

(Data on the production volumes of mining products and petroleum are shown in annexed table 10.)

In view of the importance of mining products as a source of foreign exchange, it is expected that considerable pressure will continue to be placed on this activity.

#### 5. Social effects

As was discussed earlier, the negative effects which policies aimed at reducing aggregate demand have had on social conditions are much more evident, especially in urban areas. As a consequence of the adjustment policies that have been applied, the urban industrial sector has become the most severely depressed economic activity. Indeed, the gross domestic product of the industrial sector shrank in absolute terms for three years in a row (1981-1983). This situation has been exacerbated by the steep decrease seen in the gross domestic product of tertiary sectors since 1982. The per capita gross domestic product fell between 1981 and 1983 and thereafter grew at such a slow rate until 1988, when it decreased once again, that it is still below its 1980 level. Moreover, urban unemployment has actually risen or has slowed its rate of decrease in many countries. At the same time, real wage levels have dropped even more than the per capita gross domestic product. The food supply has shrunk and, as a result of inflation (which has been fueled by adjustment policies), food prices have climbed. Finally, there is also evidence of a deterioration in infant and child nutrition, education and health conditions.

(See annexed tables 1 and 2 and the information concerning trends in the gross domestic product presented in chapter one.)

All of the above has led to a reduction in income for the majority of the population which has probably been accompanied by a deterioration in income distribution as well. This is the basis for the claim that, taken as a whole, the adjustment programmes now in effect have tended to increase overall poverty or, in other words, the number of people living below the poverty line. (3)

Although it is true that rural-urban migration appears to have been reversed or curbed by the relative improvement of conditions in rural as compared to urban areas as a consequence of the adjustment process, inter-city movements away from the better-developed urban areas and towards slum areas —precisely because of the urban industrial recession and the growing number of people living in extreme poverty— have come to be a more important factor in this respect.

The increase in poverty in the cities has had a negative impact on the environment in urban areas, since it tends to lead to urban blight, along with all the other phenomena which are associated with deteriorating living conditions: an increased incidence of various diseases, malnutrition, cultural deprivation, etc.

On the other hand, an increase in poverty in rural areas, which could occur as a result of the declining attractiveness of migrating to the cities, might well lead to environmentally-harmful practices such as slash and burn agriculture on hillsides and in agricultural frontier zones.

### III. RELEVANT CONSIDERATIONS AND PRELIMINARY CONCLUSIONS

#### A. RELEVANT CONSIDERATIONS

The broader perspective which serves as the framework for this analysis is based on a recognition of the existence of a global process of social and ecological deterioration and the belief that this process can only be altered if meaningful changes are made in the prevailing styles of development.\*/

Nonetheless, the tendencies observed in respect to the deterioration of natural resources appear to be similar in almost all the countries of the region, regardless of their political orientations, both past and present.

It is believed that, in general, and especially over the medium and long terms, it is perfectly possible for environmental and economic objectives to be compatible with one another. Unfortunately, their compatibility is not always immediately apparent, and decisions are often taken which will have beneficial economic and/or social effects in the short run but which, in the medium and long terms, will lead to the deterioration of the environment.

To a great extent, the countries of the region depend on the exploitation of their natural resources in the short term. However, these resources are being depleted, and the problems in this respect are aggravated by rapid population growth. Nonetheless, in many cases the rural population of the subcontinent has had no option but to intensify the exploitation of locally-available natural resources, to the great detriment of the environment.

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\*/ Osvaldo Sunkel has proposed the following definitions (formulated by A. Pinto and J. Graciarana, respectively) of the concept of a development style: "the manner in which, within a given system, human and material resources are organized and allocated to solve the questions of what, for whom and how to produce goods and services", or, "the specific dynamics of the modality adopted by a system within a given sphere and at a given point in time". (16)

The conclusion that qualitative changes need to be made in the region's development styles is supported by the fact that even though most of the countries have a natural resource potential which --although subject to progressively intensified deterioration processes-- is still sufficient to meet the needs of the people, a large percentage of the population continues to live under inadequate or highly unsatisfactory conditions.

The preceding discussion has illustrated the fact that economic growth has been based on an increasingly improper exploitation of natural resources. Throughout the region, although to differing extents, the countries' natural resources have been impaired, thereby jeopardizing their future usefulness, and the supply of such resources has been decreasing in terms of both quality and quantity.

All the various types of environmentally harmful processes which can be identified in Latin America and the Caribbean were already in existence long before the crisis, and this is, of course, also true of the human and natural forces which have engendered these processes. Indeed, many of the most detrimental processes date back to the colonial era, as is the case of deforestation, erosion and the depletion of mineral deposits, to cite a few of the more significant examples. What has changed, however, is, firstly, the way in which the adverse impacts of these processes are perceived and assessed and, secondly, the objective magnitude of the impacts.

A great deal of responsibility for environmentally-harmful processes can also be laid at the door of various types of pre-crisis economic policies, including pricing policies on agricultural and forestry products and inputs, tax and subsidization policies, foreign trade policies, policies on the management of State-owned natural resources, and various sectoral policies.

Indeed, government action during the pre-crisis period was, either directly or by omission, generally at odds with a proper consideration of environmental variables, and the indications are that this will continue to be the case. There is an ongoing contradiction between, on the one hand, official statements advocating a proper form of environmental management and, on the other, government action, which, especially in sensitive areas in terms of economic growth, tends towards options that, over the medium or long term, lead to the deterioration of the environment.

The economic policy schemes now being adopted, which emphasize the role of the market in allocating resources and the importance of private

enterprise, tend to overlook the fact that some processes of environmental deterioration are set in motion by market imperfections, the externalities associated with many activities, and the type of resource allocation resulting from a highly inequitable distribution of income and wealth. Failure to engage in the form of market intervention represented by the introduction of various types of measures aimed at preventing pollution, the over-exploitation of renewable resources, the depletion of non-renewable resources, urban blight, etc., constitutes a sin of omission.

The lack of commitment on the part of public-sector authorities and executives to the incorporation of environmental variables into their decision-making process stems from their belief that such considerations are to some extent at cross-purposes with economic development. In addition, these authorities and executives lack clear-cut mechanisms for incorporating the environmental dimension into public-sector measures and decision-making, and the inclusion of environmental factors in their economic analyses is hampered by such problems as a lack of physical data.

Finally, there is also a whole array of structural situations that often lead to actions which, more often than not, have an adverse impact on the environment. These structural elements, which are the object of a steady stream of policy decisions, include the extreme forms of agricultural land tenure (i.e., latifundia and minifundia) associated with over and underutilization of farmland, as well as unregulated public ownership and/or situations in which it is not clear who holds the rights over many resources (water, forests, mineral deposits, etc.) that are subject to over-exploitation and depletion. Another situation which falls into this category is that of public goods (whether publicly or privately owned) whose use does not involve their consumption in a physical sense -- parks, the landscape, ecosystems and rare life forms, biological diversity, etc. -- but that can nonetheless be impaired or destroyed.

#### B. PRELIMINARY CONCLUSIONS

In view of the fact that environmental deterioration is a long-standing process, and accepting, as only logical, the proposition that the factors discussed above are part of a context which encourages, induces or paves the way for the causes of such deterioration, it may be concluded that the

environmental problems of today are less closely linked to given situations existing either now or in the recent past than they are to the development styles prevailing in the region --styles which, moreover, are largely responsible for its overindebtedness, which was one of the main causes of the crisis.

The situation in the region is no longer the same as it was before the crisis, and it is therefore safe to assume that its determinants have also changed. However, the crisis has had many conflicting effects, which makes it difficult to foresee the ultimate outcome of the interaction between pre-crisis and post-crisis policies.

In any event, it is important to note that the combination of many factors associated with both the national and the international economies in recent years which are neither necessarily nor clearly linked to the external debt crisis, as well as the effects of highly unusual weather conditions (which have been favourable in some cases and adverse in others) and other natural phenomena, introduce a degree of ambiguity and uncertainty in any such analysis, particularly those having a regional scope.

At the country level it may be seen that, as a consequence of these difficulties, the course followed by some processes of environmental deterioration are being strongly influenced by factors unrelated to the crisis, and it is not always possible to identify clear-cut cause-and-effect relationships. These types of problems have also been encountered when attempts are made to examine the effects of the crisis in other areas, such as the economic and social fields.

In particular, the natural phenomena which have occurred during the post-crisis period --whether or not compounded by prior environmental changes brought about by man-- have had a strong impact on many natural ecosystems, on urban sectors and on economic activities.

Other factors also add to the difficulty of analysing the connection between adjustment policies and instances of environmental deterioration. In the agricultural sector, for example, the long-term production trends of some products are heavily influenced by technological innovations and appear to have been virtually unaffected by the adjustment. Other products, such as some domestic-market staples, whose production processes have been only marginally influenced by technological changes, have continued to follow

their usual downward trend, and the adjustment seems to have affected them very little. (11)

In fact, the rural communities engaged in small-scale agriculture and subsistence farming are usually isolated from external economic disruptions, since they are less involved in the money-based economy and, in the short and medium terms, therefore do not internalize the effects of economic changes.

Moreover, in some branches of production, such as certain mining activities, product-specific promotion policies have determined production trends which neutralize or cloak the effects of the crisis.

Finally, in the case of the agricultural sector, post-crisis production trends have in many cases been altered by international price movements. This has also occurred with respect to many mining products, among which petroleum is the most striking example due to its manifold economic effects and the severity of its price decrease in 1986.

One preliminary conclusion that can nonetheless be reached is that neither the economic crisis nor the adjustment policies implemented in response to it have given rise to actions which have as yet triggered new processes of environmental deterioration. Adjustment policies have, however, exacerbated existing social processes in some cases, have been conducive to processes associated with monitoring and regulatory activities, and have given rise to potential risks in respect of certain natural resources which have not yet been fully manifested. It should also be noted that the discontinuation or slackening of certain economic activities may have, in turn, halted or slowed down some processes of deterioration.

All the indications are that the economic crisis conditions existing generally in the region will persist over the medium term and that national authorities do not have any clearly-defined picture of immediately viable alternative models that would permit the crisis to be resolved in a way that would not aggravate the existing problems of social and environmental deterioration.

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Annex 1

**SYNOPSIS OF ENVIRONMENTAL EFFECTS OF THE CRISIS**

SYNOPSIS OF POSSIBLE EFFECTS OF ADJUSTMENT POLICIES ON ENVIRONMENTAL DETERIORATION PROCESSES

Adjustment policies	General goals	Policy instruments	Immediate actions	Deterioration processes	Impacts, new processes	
					Short/medium term	Medium/long term
* Policies aimed at reducing aggregate demand	* Reduce fiscal deficit	* Contraction of current and capital expenditure in the public sector	* Reduction or elimination of supervisory activities  * Postponement, reduction or elimination of investments in new works and in repair and maintenance of existing works  * Reduction or elimination of studies on environmental impact evaluation or mitigation	* Invasion of protected areas for illegal extraction of valuable species  * Unsuitable disposal of industrial waste  * Deterioration of municipal and sanitation infrastructure and services  * Lack of deterioration of projects to protect and/or correct sedimentation, destruction of water courses, etc.  * Project implementation without efforts to prevent or minimize adverse effects	* Depredation and risk of loss of ecologically valuable species  * Urban pollution  * High incidence of rare natural phenomena  * Destruction of valuable ecosystems, unique formations, scenery, etc., during project implementation	* Conversion of areas to farming and livestock activities  * Pollution of farm, aquaculture and recreational areas  * Deterioration of physical infrastructure by silting up of dams, equipment damage, etc.  * Multiple deterioration processes

(cont. 1)

Adjustment policies	General goals	Policy instruments	Immediate actions	Deterioration processes	Impacts, new processes	
					Short/medium term	Medium/long term
* Policies aimed at reducing aggregate demand	* Improve trade balance	* Reduction of domestic credit * Limitation of money supply expansion	* Reduction and/or elimination of special programmes in support of children and marginal sectors  * Reduction of private sector investment and operations; depression of urban-industrial activities	* Restriction of poor sector's access to health services and education  * <u>Idem.</u>  * Inter-urban migration and slum expansion  * Lower wages, increased unemployment and underemployment, less food at higher prices, leading to greater urban poverty and limiting rural migration prospects	* Higher incidence of disease, denutrition, infant mortality  * Increased pressure on slopes and frontiers for fuelwood and crop raising	* Cultural deprivation  * Settlements in unsuitable areas



(concl.)

Adjustment policies	General goals	Policy instruments	Immediate actions	Deterioration processes	Impacts, new processes	
					Short/medium term	Medium/long term
* Policies aimed at modifying relative prices of goods, reallocating spending	* Improve balance of payments by bettering the relative position of tradeable goods	* Exchange and trade policy instruments	* National currency devaluation	* <u>Idem.</u>	* Deforestation of river basins	* <u>Idem.</u>
	* Expand supply of tradeable goods	* Incentives to mobilize production factors	* Increased import duties	* Aquiculture expansion in areas of importance for other purposes (biological reserves, mangroves, farming)	* Deterioration and risk of coastal ecosystem destruction	* Accelerated erosion and sedimentation in river basins
			* Diverse sectoral incentives	* Increased catches of various marine resources, even during closed seasons	* Overexploitation and reduced resource supply	* Loss of hydrobiological resources, owing to interrupted cycles
			* Expansion of mining exploitation areas or installation of new operations, ignoring environmental impact		* Destruction of ecosystems and valuable formations	* Depletion of mineral resources
					* Pollution	* Depletion of mineral deposits
						* Incentive for spontaneous settlement

Annex 2

**STATISTICAL COMPLEMENTARY TABLES**

Table 1

## LATIN AMERICA AND THE CARIBBEAN: GROSS DOMESTIC PRODUCT, 1970-1987. SECTORAL SHARE AND TOTAL

Activity <sup>a/</sup>	1970	1980	1981	1982	1983	1984	1985	1986	1987
Agriculture, fishing, etc.	11.8	9.8	10.2	10.3	10.6	10.6	10.7	10.1	10.6
Mining	7.9	5.1	5.1	5.0	5.1	5.1	5.0	5.0	4.4
Manufacturing	22.4	23.7	22.3	22.0	21.6	22.0	22.2	22.7	22.8
Electricity, gas and water	5.4	6.3	6.3	5.9	5.2	4.9	5.0	5.1	5.0
Construction	1.0	1.5	1.5	1.7	1.8	1.9	1.9	2.0	2.1
Trade	5.4	6.2	6.3	6.4	6.4	6.3	6.3	6.3	6.5
Transport and communications	18.2	18.8	18.8	18.5	18.0	18.0	17.8	17.6	17.6
Personal services and other	27.8	28.6	29.6	30.2	31.3	31.2	31.1	31.2	30.9
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (US\$ million) <sup>b/</sup>	417 405.1	717 075.0	721 830.7	713 499.8	694 475.4	719 424.7	743 838.2	772 109.2	803 717.9
Per capita (US\$)	1 483.2	2 005.9	1 974.3	1 908.4	1 816.8	1 841.1	1 863.8	1 893.5	1 879.9

Source: ECLAC Statistical Yearbook (table 101, 1987, and table 112, 1988). (1)

<sup>a/</sup> Percentage share.

<sup>b/</sup> GDP after adjustment for banking service charges and import duties. Percentages calculated on GDP subtotal before adjustment.

Table 2

## URBAN UNEMPLOYMENT IN SELECTED COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN, 1970-1986

(Average annual rates)

Country	1970	1980	1981	1982	1983	1984	1985	1986	1987
Argentina	4.9	2.6	4.7	5.3	4.7	4.6	6.1	5.2	5.9
Brazil	6.5	6.2	7.9	6.3	6.7	7.1	5.3	3.6	3.7
Colombia	10.6	9.7	8.3	9.1	11.7	13.4	14.0	13.8	11.7
Costa Rica	3.5	6.0	9.1	9.9	8.5	6.6	6.7	6.7	5.6
Chile	4.1	11.7	9.0	20.0	19.0	18.5	17.0	13.1	11.9
Ecuador	4.2	5.7	6.0	6.3	6.7	10.5	10.4	12.0	12.0
Mexico	7.0	4.5	4.2	4.2	6.6	5.7	4.4	4.3	3.9
Panama	10.3	10.4	10.7	10.1	11.7	12.4	15.6	12.6	14.0
Uruguay	7.5	7.4	6.7	11.9	15.5	14.0	13.1	10.7	9.3
Venezuela	7.8	6.6	6.8	7.8	11.2	14.3	14.3	12.1	9.9
Total <sup>a/</sup>	6.7	6.0	6.7	6.6	7.8	8.1	7.2	6.1	5.7

Source: ECLAC *Statistical Yearbook*, 1988 (table 20). (1)

<sup>a/</sup> This average, weighted by total population in millions of inhabitants, should be considered as only an approximation of the behaviour of the country total, since the unemployment rates have not been estimated on a common basis with respect to either methodologies, coverage or time of year in which estimates were made.

Table 3

## AGRICULTURAL AND FORESTRY AREA IN LATIN AMERICA AND THE CARIBBEAN, 1961-1987

Category	Area (thousands of hectares)					Annual growth rates (percentages)					
	1961	1970	1980	1983	1987	1960/ 1970	1970/ 1980	1960/ 1980	1980/ 1983	1983/ 1987	1980/ 1987
Annual crops <u>a/</u>	107 790	120 348	141 558	146 205	150 818	1.1	1.6	1.4	1.1	0.8	0.9
Permanent crops	23 108	24 803	29 470	29 787	30 384	0.7	1.7	1.2	0.4	0.5	0.4
Pasture-land <u>b/</u>	498 656	529 695	553 489	558 007	563 606	0.6	0.4	0.5	0.3	0.2	0.3
Agricultural area	629 554	674 846	724 517	733 999	744 808	0.7	0.7	0.7	0.4	0.4	0.4
Forests	1 072 840	1 040 424	996 412	982 567	968 535	(0.3)	(0.4)	(0.4)	(0.5)	(0.4)	(0.4)
Agric./forestry area	1 702 394	1 715 270	1 720 929	1 716 566	2 713 343	0.1	0.0	0.1	(0.1)	(0.0)	(0.1)
Irrigated land	8 245	10 173	13 939	14 401	15 231	4.3	3.2	3.6	1.1	1.9	1.5

Source: ECLAC Statistical Yearbook, 1988 (table 302). (1)

a/ The category called "arable land" by the source actually refers to land with annual or short seasonal crops, in accordance with other figures.

b/ Pasture-land or grassland, natural or cultivated.

Table 4

## LATIN AMERICA AND THE CARIBBEAN: AREA OF SELECTED CROPS, 1960-1987

Crop	Area (thousands of hectares)					Annual growth rates (percentages)					
	1960 or 1965 <sup>a/</sup>	1970	1980	1983	1987 or 1986 <sup>b/</sup>	1960/70 or 1965/70	1970/80	1960/80 or 1965/80	1980/83	1983/87 or 1983/86	1980/87 or 1980/86
Soybeans	187	1 556	11 544	11 507	13 985	23.6	22.2	22.9	(0.1)	5.0	2.8
Beans	4 692	6 231	7 297	7 272	8 838	2.9	1.6	2.2	(0.1)	5.0	2.8
Rice	4 238	6 651	8 224	7 094	8 121	4.6	2.1	3.4	(4.8)	3.4	(0.2)
Maize	18 949	25 842	21 989	25 137	29 640	3.2	(1.6)	0.7	4.6	4.2	4.4
Sorghum	1 276	3 677	3 916	5 205	4 512	11.2	0.6	5.8	9.9	(3.5)	2.0
Wheat	7 467	7 959	9 972	10 794	10 777	0.6	2.3	1.5	2.7	(0.0)	1.1
Subtotal of basic grains	36 809	51 916	62 942	67 009	75 873	3.5	1.9	2.7	2.1	3.2	2.7
Cassava	2 247	2 574	2 667	2 686	2 707	2.8	0.4	1.1	0.2	0.3	0.2
Potatoes	1 077	1 098	1 069	942	993	0.4	(0.3)	(0.0)	(4.1)	1.8	(1.2)
Subtotal of roots and tubers	3 324	3 672	3 736	3 628	3 700	2.0	0.2	0.8	(1.0)	0.7	(0.2)
Cotton	3 911	5 932	5 615	4 227	3 414	4.3	(0.5)	1.8	(9.0)	(5.2)	(6.9)
Sugar cane	4 001	5 052	6 286	6 822	8 012	2.4	2.2	2.3	2.8	4.1	3.5
Coffee	6 186	5 158	5 810	5 771	5 848	(3.6)	1.2	(0.4)	(0.2)	0.3	0.1
Subtotal of agro-industrial crops <sup>c/</sup>	14 098	16 142	17 711	16 820	7 274	1.4	0.9	1.1	(1.7)	0.7	(0.4)
Total <sup>c/</sup>	54 231	71 730	84 389	87 457	96 847	2.8	1.6	2.2	1.2	2.6	2.0

Source: ECLAC Statistical Yearbook, 1987. (1)

<sup>a/</sup> 1965 for cassava, potatoes and coffee (ECLAC Statistical Yearbook, 1987).

<sup>b/</sup> 1986 for cassava and potatoes.

<sup>c/</sup> Agro-industrial and total growth rates are based on the assumption that the areas of cassava, potatoes and coffee for 1960 are equal to those for 1965.

Table 5

## FORESTRY PRODUCTION AND EXPORTS IN LATIN AMERICA AND THE CARIBBEAN, 1961-1985

Period	Roundwood (thousands m <sup>3</sup> )		Sawnwood (thousands m <sup>3</sup> )		Panels (thousands of tons)		Pulp (thousands of tons)		Paper and paperboard (thousands of tons)		Value (millions US\$) Exp.
	Prod.	Exp.	Prod.	Exp.	Prod.	Exp.	Prod.	Exp.	Prod.	Exp.	
1961/63	191 000	30	12 000	1 431	600	61	761	30	1 892	31	79
1969/71	232 000	146	16 000	2 173	1 625	181	1 658	145	3 614	121	225
1979/81	328 000	1 227	25 000	2 670	4 158	572	4 381	1 227	7 402	415	1 444
1983/85	358 000	1 470	27 000	2 915	4 553	629	5 611	1 450	8 589	789	1 476
Cumulative annual growth rates (percentages)											
1961/63-											
1979/81	3.0	22.9	4.2	3.5	11.4	13.2	10.2	22.9	7.9	15.5	17.5
1979/81-											
1983/85	2.2	4.6	1.9	2.2	2.3	2.4	6.4	4.3	3.8	17.4	0.5

Source: Potentials for agricultural and rural development, FAO (tables 3-7), 1988. (13)

Table 6

## PRODUCTION AND TRADE OF FUELWOOD AND CHARCOAL IN LATIN AMERICA AND THE CARIBBEAN, 1974-1985

Year	Production		Exports		Imports	
	volume (thousands m <sup>3</sup> )	volume (thousands m <sup>3</sup> )	value (thousands US\$)	value (thousands US\$)	volume (thousands m <sup>3</sup> )	value (thousands US\$)
1974	202 861	5	67		27	826
1975	208 018	13	1 282		9	409
1976	213 142	21	1 201		6	472
1977	218 050	106	1 657		12	724
1978	223 529	152	1 843		4	252
1979	230 752	214	3 715		4	251
1980	235 775	167	2 242		5	299
1981	240 822	71	1 792		7	874
1982	242 287	23	611		5	343
1983	254 457	57	1 525		3	321
1984	260 175	10	232		4	174
1985	265 430	7	266		6	222
Percentage increases:						
1974-1980	16.2	3 240.0	3 246.3		(81.5)	(63.8)
1980-1985	12.6	(95.8)	(88.1)		20.0	(25.8)
Annual cumulative growth rates (%)						
1974-1980	2.5	79.5	79.5		(24.5)	(15.6)
1980-1985	2.4	(47.0)	(34.7)		3.7	(5.8)

Source: Yearbook of forestry products 1974-1985, FAO. (12).

Table 7

## MARINE FISHING: CATCHES BY FISHING REGIONS IN LATIN AMERICA AND THE CARIBBEAN, 1970-1986

(Thousands of tons)

Year	South-East Pacific	South-West Atlantic	Central-West Pacific	Central-West Atlantic	Regional Total
1970/74 <sup>a/</sup>	7 939	846	989	1 495	11 269
1975/79 <sup>a/</sup>	5 314	1 092	1 699	1 626	9 731
1980	6 231	1 186	2 423	1 807	11 647
1981	6 835	1 180	2 468	1 907	12 390
1982	7 918	1 419	2 350	2 181	13 868
1983	6 278	1 561	1 558	2 271	11 668
1984	8 547	1 450	2 093	2 606	14 696
1985	9 627	1 569	2 652	2 255	16 103
1986	11 952	1 710	2 618	2 110	18 390
Percentage increases:					
1970/74-1980 <sup>a/</sup>	(21.5)	40.2	145.0	20.9	3.4
1980-1983	0.8	31.6	(35.7)	25.7	0.2
1983-1986	90.4	9.5	68.0	(7.1)	57.6
Annual cumulative growth rates (%):					
1970/74-1980 <sup>a/</sup>	(3.4)	4.9	13.7	2.7	0.5
1980-1983	0.3	9.6	(13.7)	7.9	0.1
1983-1986	23.9	3.1	18.9	(2.4)	16.4

Source: Potentials for agricultural and rural development, annex V (tables 8 to 11), FAO, 1988. (13).

<sup>a/</sup> Averages. For the calculation of these rates, the median point of the range was taken.

TABLE 8

FISH MEAL PRODUCTION IN LATIN AMERICA AND  
THE CARIBBEAN, 1976-1986

(Thousands of tons)

Year	Production
1976	1 312
1977	969
1978	1 282
1979	1 447
1980	1 350
1981	1 490
1982	1 757
1983	1 260
1984	1 879
1985	2 270
1986	2 629
Percentage increases:	
1976-1980	2.9
1980-1983	(6.7)
1983-1986	108.7
Annual cumulative growth rates (%)	
1976-1980	0.7
1980-1983	(2.3)
1983-1986	27.8

Source: Potentials for agricultural and rural development, annex V (table 14),  
FAO, 1988. (13)

Table 9

FOREIGN TRADE OF THE FISHING SUBSECTOR IN LATIN AMERICA  
AND THE CARIBBEAN, 1962-1986

(Millions of dollars annually)

Period <u>a/</u>	Exports	Imports
1962-1966	276.04	66.80
1967-1971	449.21	109.82
1972-1976	670.95	171.42
1977-1981	1 702.84	348.24
1982-1986	2 205.20	287.88
Percentage increases:		
1972/76-1977/81	153.8	103.2
1977/81-1982/86	29.5	(17.3)
Annual cumulative growth rates (%) <u>b/</u>		
1972/76-1977/81	20.5	15.2
1977/81-1982/86	5.3	(3.7)

Source: Potentials for agricultural and rural development, annex V (table 2, appendix), FAO, 1988. (13)

a/ Annual averages.

b/ The middle year of each period is taken.

Table 10

## PRODUCTION OF SELECTED MINING RESOURCES IN LATIN AMERICA AND THE CARIBBEAN, 1960-1987

Resource a/	Volume of production b/					Annual growth rates (percentages)					
	1960	1970	1980	1983	1987	1960/70	1970/80	1960/80	1980/83	1983/87	1980/87
Bauxite	12.96	24.71	25.06	17.95	20.21	6.7	0.1	3.4	(10.5)	3.0	(3.0)
Copper	0.80	1.00	1.66	1.82	2.00	2.3	5.2	3.7	3.3	2.3	2.7
Tin	22.74	35.59	36.17	41.57	42.80	4.6	0.2	2.3	4.7	0.7	2.4
Iron	46.91	88.36	137.65	108.92	163.34	6.5	4.5	5.5	(7.5)	10.7	2.5
Zinc	0.49	0.68	0.94	1.04	1.11	3.3	3.3	3.3	3.2	1.8	2.4
Total	83.91	150.34	201.47	171.29	229.47	6.0	3.0	4.5	(5.3)	7.6	1.9
Petroleum	218.60	305.59	334.21	374.88	365.51	3.4	0.9	2.1	3.9	(0.6)	1.3

Source: ECLAC Statistical Yearbook, 1988. (1)

a/ The ECLAC Statistical Yearbook also includes coal production figures, but only up to 1980.

b/ Millions of m<sup>3</sup> for petroleum. Millions of tons for other resources.