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# LATIN AMERICAN DEVELOPMENT AND THE INTERNATIONAL ECONOMIC SITUATION

## Second Regional Appraisal of the International Development Strategy

## Part One

## ECONOMIC AND SOCIAL DEVELOPMENT OF LATIN AMERICA

## Volume 2

# Chapter IV

# INDUSTRIAL DEVELOPMENT

## A. THE INDUSTRIAL SECTOR

### 1. Objectives and goals for the industrial sector

Generally speaking, industrialization is considered to be a basic factor in the economic and social development and in the modernization of the countries. Industrial development has been and continues to be one of the major concerns of those responsible for guiding the economy of the countries of the region. The International Development Strategy for the Second Development Decade approved by the United Nations General Assembly, accorded fundamental importance to the industrial sector, and included among its other objectives the establishment of a minimum annual average rate of growth of 8 per cent in manufacturing output as one of the conditions required to accelerate the economic and social progress of the countries and "at least to make a modest beginning towards narrowing the gap in living standards between developed and developing countries".

The actual aim of the Appraisal of the International Development Strategy as far as industrialization is concerned is that the developing countries should achieve a greater diversification and modernization of their economies through an adequate expansion of the industries which use local raw materials, produce essential intermediate goods or increase export earnings, or all three together. The expansion and diversification of exports of manufactures by the developing countries is also sought after, mainly through the terms of the commercial and financial treatment which the developed countries undertake to provide so that the developing countries will participate more in the growth of international trade in these products.

The general concept of development contained in the Strategy emphasizes the need for material progress to be at one and the same time a stimulus to and a result of the changes in the social structure of the developing countries, so as to achieve a more equitable distribution of income and wealth, to raise substantially the level

/of employment,

of employment, to expand and improve facilities for education, health, nutrition, housing and social welfare and to safeguard the environment. The industrialization process should contribute to a significant extent to carrying out these aims.

In the present decade to date, Latin America has exceeded the target of 8 per cent growth in industrial output, and thus has confirmed ECLA's predictions 1/ on the need for the countries of Latin America as a group to set themselves more ambitious targets of quantitative growth by making the most of the potential capacity existing in the region.

Despite the progress made, halfway through the present decade of the International Development Strategy various symptoms of inadequacy in the processes of change which the Strategy has endeavoured to promote are to be seen, while it is also to be observed that the economic events of the last few years have, generally speaking, been detrimental to the majority of the developing countries and have brought to the fore the inability and inadequacy of the international economic co-operation machinery in existence even to alleviate the adverse consequences.

This concern brought the majority of the countries to consider it necessary to establish a new international economic order and to formulate a world action programme to carry this out; at its sixth special session the United Nations General Assembly approved both resolutions on these matters, 2/ which have already been commented on.

As regards the industrialization of the developing countries, the new international economic order would imply the fulfilment of the following aims:

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1/ See Economic Survey of Latin America, 1970, United Nations Publication, Sales Nº.: E.72.II.G.1, pp. 3 to 8, and Latin America and the International Development Strategy: First regional appraisal (E/CN.12/947, Add.1 and Add.2), chapter II.

2/ Declaration on the Establishment of a New International Economic Order and Programme of Action on the Establishment of a New International Economic Order (resolutions 3201 (S-VI) and 3202 (S-VI) of the General Assembly).

/(a) As

(a) As a matter of priority, the need is stated of increasing the share of the developing countries in world industrial production, for which purpose a new economic structure for industry would have to be created, based on a new industrial capacity mainly aimed at processing raw materials and basic commodities in the developing countries.

The creation of this new structure, which might have been considered utopian until recently, now appears at least to be feasible to some extent in the medium- or long-term as a consequence of the political, economic and ethical factors involved in the present international situation.

In fact, several developed countries are seriously considering in their industrial programmes the advisability of transferring some productive activities to developing countries, in view of the growing difficulties they are encountering in installing new plants or expanding existing plants in their own territories. The scarcity of labour and the relatively high wage-levels are one of the factors which limit industrial expansion in developed countries, and in particular the expansion of such activities as are typically low-technology-intensive. But other factors exist which also limit the expansion of some industries in advanced countries. These are: the lack of space, which is a problem which is taking on fundamental importance in some countries; the available supply of water in reasonable quantities and qualities and at a reasonable cost; environment pollution, which has reached alarming proportions in quite a few cases, and problems connected with the existence of raw materials, availability of energy, etc.

The idea of setting up raw materials and commodity transforming facilities in the developing countries that produce these commodities, given as a matter of priority in the programme of action, looms daily larger. Apart from the reasons of common sense which support the principle of this idea, there are also many cases of obvious comparative advantages which point the same way. Private interests or other reasons in opposition to this at the present time will lose force as time passes.

/On the

On the other hand, in view of present and foreseeable difficulties as regards the supply of raw materials and basic commodities, the developing countries producing these are now in a more favourable bargaining position for increasing the degree of industrialization of their economies.

(b) The recommendation that the developed countries should respond favourably, within the framework of their official aid as well as international financial institutions, to the requests of developing countries for the financing of industrial projects, and encourage investors in this sense particularly in export-oriented projects, within the context of the laws established by these countries.

Despite the brief time which has passed since the Declaration on the establishment of a new international economic order and the programme of action on the establishment of a new international economic order were approved, they have had large-scale repercussions on developing countries. As proof of this the declaration formulated by the Ministers of Industry and the delegates of the countries of the region at the Latin American Conference on Industrialization may be cited.3/ This document was inspired by the declaration and programme of action mentioned above and expresses the adherence of the signatories to the principles of industrialization laid down in them and in the International Development Strategy for the Second Development Decade, which should be complemented with international juridical norms and new instruments for action. They therefore propose a plan of action comprising various measures of national and regional scope, which would be applied by developing countries and by developed and developing countries together through concerted action to promote the industrial development of the countries of the region. The declaration states that "the reorganization of the

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3/ Industrialization in Latin America: principles and plan of action, the resolution approved at the Latin American Conference on Industrialization (Mexico, D.F. 25 to 29 November 1974).

international economic order requires the adaptation of the machinery and arrangements for international co-operation and that the United Nations, its specialized agencies, and the regional economic commissions constitute the obvious forums for the negotiation by governments of the agreements and undertakings relating to the establishment of the new order in industry". The declaration also states that the principles and guidelines contained in it "constitute the Latin American position in the international negotiations which are to be held, especially at the Second General Conference of UNIDO".

The declaration lays down some policy norms and measures already contained in the above-mentioned documents although now they appear in the setting of the more specific problems and conditions of Latin America.

The measures proposed at the national level include the existing concern that the industrialization process should contribute to increasing the external autonomy of the developing regions and countries, "with special attention to the promotion of exports and to the terms on which transfers of capital and technology take place". In the same context the aim is also mentioned of seeking "to increase the value added to the raw materials being processed and exported", "to ensure that the promotion of industrialization does not take place to the detriment of primary sector activities", and at the same time to ensure that the process of import substitution takes place with a greater degree of international-level efficiency, so that protection will not prove to be excessive (especially as regards foreign exchange and capital) and so as to guarantee adequate international-level competitiveness.

The declaration also states the need for "an adequate distribution of income, which, inter alia, will make possible the rapid expansion of domestic markets" and thus contribute to raising the standards of living and eliminating marginality and unemployment.

Another notable aspect of the declaration gives special importance to the co-ordinated action of the countries of the region as regards industrial development. Two basic objectives, very closely

/related, are

related, are established; these are the "strengthening of existing economic integration schemes", and "harmonization and co-ordination of economic policies, especially in the industrial field, and the fullest utilization of the possibilities for industrial complementation, with due attention to economies of scale and specialization". In connexion with this latter objective, it is proposed to strengthen and create Latin American multinational enterprises and the corresponding machinery of financial support, regional import substitution programmes, basic food production programmes and arrangements for the supply of energy sources and other scarce raw materials, and, lastly, the joint utilization of the productive resources of border areas between countries. All this should be considered in the light of the establishment of differential treatment favouring the relatively less developed countries.

## B. APPRAISAL OF THE INDUSTRIAL SECTOR DURING THE PERIOD 1970-1974

### 1. Rate of growth, degree of industrialization and structure of production

#### (a) Rate of growth

The annual rate of growth of the gross product for the manufacturing industry in Latin America in the first three years of the 1970s was 8.7 per cent for the region as a whole. This rate exceeded the target of 8 per cent proposed in the International Development Strategy for the Second United Nations Development Decade. The process can also be said to show a long-term upward trend, since between 1950-1960 the total average rate was 6 per cent and during 1960-1970, it was 6.9 per cent.

Nevertheless, the importance of this increasingly rapid tempo decreases when other comparisons are introduced. For example, no important increases have taken place in the share of the region's manufacturing product in world product levels; it remained at 3.4 per cent during the last decade while Latin America increased

its share in the population of the world from 7.3 to 7.8 per cent during the same period. This means that if the industrialized countries maintained the same growth capacity during the 1970s as in the last decade, the target of 8 per cent proposed by the IDS for the developing countries would not signify appreciable changes in the sharp difference between the per capita manufacturing product in Latin America and the average for the industrialized countries. The prospects offered by the International Development Strategy are not encouraging as far as reducing the industrial disparity between the two types of country is concerned; it should be borne in mind that one of the objectives pursued by the Strategy is the reduction of the distances separating the developing world from the developed countries.

Considerable differences are also to be seen in the rate of industrial growth of the different countries of the region. Although the above-mentioned target was achieved on average, only four countries actually exceeded it, while in the previous decade nine countries had exceeded the general average, and in the 1950s ten countries (see table 1). The high weighting of Brazil in the Latin American averages and this country's high rate of industrialization bring the general average to the level indicated.

In fact, between 1970-1973 fifteen countries did not achieve the regional target and their average was only 6.6 per cent. All this goes to indicate that the differences in the levels of industrialization of the Latin American countries (contribution to the regional manufacturing product, per capita availability of manufactured goods and degree of industrialization) tend to increase, and the many small and relatively less developed countries find themselves in an unfavourable position.

/Table 1

Table 1

LATIN AMERICA: ANNUAL GROWTH RATES OF THE MANUFACTURING PRODUCT

| | 1960-1970 | 1970-1973 | 1971 | 1972 | 1973a/ |
|---|---|---|---|---|---|
| Argentina | 5.6 | 7.0 | 7.1 | 7.2 | 6.8 |
| Brazil | 7.0 | 13.7 | 11.3 | 14.1 | 15.8 |
| Mexico | 9.1 | 6.8 | 3.2 | 9.0 | 8.2 |
| Subtotal | 7.1 | 9.2 | 7.2 | 10.1 | 10.4 |
| Colombia | 6.0 | 9.2 | 7.9 | 10.0 | 9.8 |
| Chile | 5.3 | 3.8 | 12.9 | 3.5 | -5.1 |
| Peru | 7.4 | 7.7 | 8.8 | 7.0 | 7.4 |
| Venezuela | 7.3 | 7.9 | 6.6 | 8.8 | 8.3 |
| Subtotal | 6.2 | 7.0 | 9.2 | 7.2 | 4.7 |
| Costa Rica | 8.8 | 6.2 | 6.0 | 5.5 | 7.0 |
| El Salvador | 8.2 | 5.6 | 7.0 | 5.2 | 4.5 |
| Guatemala | 7.6 | 6.1 | 7.2 | 5.2 | 6.0 |
| Haiti | 1.7 | 6.8 | 6.0 | 7.1 | 7.2 |
| Honduras | 6.8 | 7.3 | 8.2 | 7.4 | 6.3 |
| Nicaragua | 11.9 | 4.2 | 4.8 | 5.7 | 2.2 |
| Panama | 11.1 | 6.4 | 8.2 | 6.3 | 4.7 |
| Dominican Republic | 5.6 | 12.5 | 17.0 | 12.9 | 7.5 |
| Subtotal | 7.9 | 6.8 | 8.2 | 6.8 | 5.5 |
| Bolivia | 6.7 | 5.3 | 2.8 | 6.7 | 6.5 |
| Ecuador | 6.2 | 10.4 | 8.7 | 9.0 | 13.6 |
| Paraguay | 5.8 | 4.5 | 3.3 | 6.3 | 4.0 |
| Uruguay | 1.6 | -0.8 | -1.8 | -0.3 | -0.4 |
| Subtotal | 4.0 | 4.4 | 2.7 | 4.5 | 6.0 |
| Latin America | 6.9 | 8.7 | 7.5 | 9.4 | 9.2 |

Source: ECLA, on the basis of official statistics.

a/ Preliminary figures.

/This means

This means that the countries with larger markets and more abundant natural resources, with an agricultural sector which does not constitute a bottleneck in their economies and with an increasing share of manufactuing activity in external trade, advance more rapidly with their industrialization than the small countries which meet with serious obstacles in the form of the small size of their markets and their limited capacity for processing their natural resources and sharing in the world manufactures market. It may not always be advisable for the small countries to propose ambitious industrial growth targets for themselves nor feasible for them to cross the distance which separates them from countries with a more advanced and thriving industrialization process. This means that if a regional development strategy proposes to reduce the differences observed in the industrial development of the component countries, special attention will have to be given to the relatively less industrially developed countries, both as regards the intensiveness and quality of international co-operation and the application of the sub-regional integration systems, which added to the local efforts of these countries, could speed up and expand local manufacturing activities.

(b) Degree of industrialization

The share of the Latin American industrial sector in the region's gross domestic product increased noticeably between 1970-1973. The level of industrialization measured by this share increased from 24.5 per cent to 25.9 per cent during this period; in 1960 it has achieved 21.7 per cent (see table 2). Although these values are apparently very high and similar to those exhibited by some industrialized countries, comparisons with such countries should not be given much significance, mainly because the resulting level of industrialization varies considerably depending on the base year for calculating the values the quotient of which constitutes the coefficient in question.

/Table 2

Table 2

LATIN AMERICA: DEGREE OF INDUSTRIALIZACION a/

| | 1960 | 1970 | 1973 |
|---|---|---|---|
| Argentina | 31.1 | 35.3 | 38.3 |
| Brazil | 22.8 | 25.3 | 27.2 |
| Mexico | 19.4 | 23.6 | 24.0 |
| Subtotal | 23.5 | 27.4 | 28.8 |
| Colombia | 17.3 | 18.6 | 20.0 |
| Chile | 23.2 | 25.2 | 26.6 |
| Peru | 17.9 | 22.6 | 24.0 |
| Venezuela | 12.0 | 16.0 | 18.0 |
| Subtotal | 15.1 | 18.7 | 19.8 |
| Central America | 12.7 | 16.9 | 17.0 |
| Panama | 12.8 | 17.2 | 17.0 |
| Haiti | 12.0 | 13.2 | 14.0 |
| Dominican Republic | 10.1 | 15.1 | 15.8 |
| Subtotal | 12.7 | 16.0 | 16.4 |
| Bolivia | 10.0 | 13.5 | 13.7 |
| Ecuador | 15.6 | 16.8 | 16.6 |
| Paraguay | 16.7 | 18.8 | 18.4 |
| Uruguay | 21.2 | 21.0 | 20.8 |
| Subtotal | 16.8 | 18.1 | 17.7 |
| Latin America | 21.7 | 24.5 | 25.9 |

Source: ECLA, on the basis of official statistics.

a/ Defines as the percentage ratio of the value of the gross manufacturing product to that of the gross domestic product in a given year, estimated at factor cost, in millions of dollars at 1960 prices.

/It is

It is estimated that as the relative prices of manufactures in Latin America are, generally speaking, higher than in the industrialized countries, the industrial product and hence the degree of industrialization, are over-estimated. Studies made in some countries would appear to show an over-estimation of the degree of industrialization of between 20 and 25 per cent. It is also the case that in the appraisal of the gross domestic product of the Latin American countries both agricultural raw materials and minerals and a large part of services are underpriced, because the relative prices of these goods and services are, generally speaking, lower than in the developed countries. The effect of this underpricing would have a similar effect to that mentioned above but there are no known estimates of its influence.

It is thus not logical to consider comparisons of the values of the degree of industrialization in Latin America with those of other regions, until it is possible to establish conditions which will guarantee the homogeneity of the criteria used for such an estimate.

If the analysis is limited to the countries of Latin America, it should be remarked that the average obscures the real situation of the majority of these. In fact, only three - Argentina, Brazil and Chile - exceed the average value, which turns out to be as high as it is because the first two of these countries contribute 55 per cent of the region's gross product. Excluding these countries and Mexico, where the degree of industrialization is close to the average, the fifteen remaining countries have now reached an average level of industrialization of 17.7 per cent, which goes to show that industry in these countries still contributes relatively little to the general product in their economies as a whole.

The degree of industrialization increased appreciably during the three-year period in the large and medium-sized countries of the region, indicating a tendency for industry to grow rapidly in importance in their economies.

In four of the small countries of the region the values of the degree of industrialization in 1970-1974 dropped, in one case the change occurred simultaneously with a decline in the gross domestic product

/and the

and the gross industrial product; in the remaining three countries there was a decline in value with overall economic growth.

(c) The structure of production

The transformations in the structure of production were in evidence from the first stages of the industrialization process. In the countries which made progress in this area the changes increased the share of activities producing intermediate goods, consumer durables and capital goods and also tended to bring their structures of production more into line with those of the industrialized countries. These facts contributed to encouraging hopes that the industrial evolution of the industrialized countries would provide a road which the countries where development was incipient could also take, and that only adequate financial contributions and external technical assistance would be required for this to materialize in the course of time. However, it is becoming noticeable that the changes in the structure of production vary according to the economic potential of each country, rather than owing to the fact of their having begun the industrialization process earlier or later.

The nature of such changes is not obvious in the short-term, and it is therefore preferable to compare years which are widely separated. Thus, the overall values for Latin America as a whole do not really reflect the major differences which arise if the countries are considered separately. In fact, production of intermediate goods, consumer durables and capital goods apparently covered nearly 50 per cent of the entire industrial output of the region in 1971. However, only in three largest countries of the region and in Venezuela was this actually the case.4/ In the majority of the remaining countries, the industries producing goods for immediate consumption are notably in the majority, and cover a wide range which is as much as 89.3 per cent in Bolivia. This indicates that many countries of the region still have a structure of little complexity, where the inter-industrial

4/ In Venezuela the considerable importance of industries producing intermediate goods was justified by the importance of the petroleum products industry.

input-product relationship found in the industrial sector are weak, owing to the lack of adequate complementarity among the different activities of production.

This low level of complementarity does not conform to the same reasons in all the countries in which it appears. In countries where the process of generalized import substitution took place several decades back, it reflects the limitations they experience in following out the process, very probably because of the small size of their local market. In these countries, the coefficients of the imported supply of consumer goods have been low for a long time, but those corresponding to intermediate goods, and even more particularly capital goods, stand at relatively high and practically invariable levels. However, in other countries the stage in which locally-produced goods replace imports in a generalized form has still not terminated. In these ocountries the considerable predominance of consumer goods in their structures of production is associated with relatively high values, even in the case of the coefficients of imported supply of these same types of goods; those for intermediate and capital goods are still higher. For these countries import substitution is still a means of development which offers dynamic possibilities.

As regards the variations which have taken place in the structure of industrial output during the period 1960-1971, it may be seen that the share of the traditional industries in Latin America as a whole dropped from 56.5 to 50.8 per cent, which is the average of the wide differences in the changes which have taken place in the different countries (see table 3). The trend of these changes would appear to confirm the above conclusions. It is in the largest countries that the widest variations in structure are to be found, and the largest decreases in the share of industries producing traditional goods and the largest increases in the share of those producing intermediate and capital goods. Generally speaking, in the smallest countries the changes in this respect are also less important. Nevertheless, the degree of aggregation to be found in the grouping of industrial activities does not allow of any more profound analysis.

/Table 3

Table 3

LATIN AMERICA: STRUCTURE OF PRODUCTION OF THE MANUFACTURING SECTOR

(Percentages)

| | 1960 | | | 1971 | | |
|---|---|---|---|---|---|---|
| | A | B | C | A | B | C |
| Argentina | 44.5 | 26.8 | 28.7 | 33.9 | 31.9 | 34.2 |
| Bolivia | 89.0 | 7.9 | 3.1 | 89.3 | 7.2 | 3.5 |
| Brazil | 41.2 | 29.4 | 29.4 | 30.3 | 32.7 | 37.0 |
| Central America | 86.1 | 9.6 | 4.3 | 73.5 | 18.2 | 8.3 |
| Colombia | 63.4 | 27.2 | 9.4 | 58.8 | 29.1 | 12.1 |
| Chile | 61.2 | 29.1 | 9.7 | 57.8 | 33.2 | 9.0 |
| Ecuador | 75.0 | 23.1 | 1.9 | 63.1 | 31.0 | 5.9 |
| Mexico | 53.7 | 35.5 | 10.8 | 47.6 | 38.4 | 14.0 |
| Panama | 65.7 | 34.3 | ... | 62.1 | 37.9 | ... |
| Paraguay | 81.1 | 13.5 | 5.4 | 80.8 | 13.5 | 5.7 |
| Peru | 63.6 | 28.7 | 7.7 | 80.3 | 28.0 | 11.7 |
| Dominican Republic | 78.4 | 18.7 | 2.9 | 71.0 | 26.9 | 2.1 |
| Uruguay | 61.1 | 20.8 | 18.1 | 60.7 | 25.8 | 13.5 |
| Venezuela | 63.5 | 29.4 | 7.1 | 49.8 | 40.6 | 9.6 |
| Latin America | 56.5 | 26.1 | 17.4 | 50.8 | 30.0 | 19.1 |

Source: ECLA, on the basis of country data.

Notes: A: Branches mainly producing consumer goods: food, beverages, tobacco, textiles, footwear and clothing, wood and cork, furniture and accessories, printing and publishing, leather and leather manufactures, miscellaneous industries.

B: Branches mainly producing intermediate goods: paper and paper products, rubber and rubber manufactures, chemical products, petroleum products and coal, non-metallic mineral manufactures, basic metal industries.

C: Branches mainly producing capital goods and consumer durables: manufactures of metal, machinery other than electric, electrical machinery, transport equipment.

## 2. Evolution of the per capita manufacturing product

The per capita manufacturing product in Latin America recorded an annual growth rate of 3.8 per cent between 1960 and 1970 and 5.6 per cent between 1970 and 1973. Expressed in dollars at 1960 prices, it increased from 84 dollars in 1960 to 123 dollars in 1970 and 146 dollars in 1973 (see table 4). In the region as a whole, the per capita manufacturing product accounted for around one-quarter of the per capita gross domestic product in 1973, while in 1960 it was nearly one-fifth of this. This situation is closely associated with the evolution of Latin American industrialization, and indicates the increasing although not spectacular importance which industry is acquiring in the region as far as the supply of goods and services is concerned.

Despite the progress noted, it should be mentioned that Latin America's position compared with the world average and the average for the industrialized countries underwent practically no variation between 1960 and 1973. Latin America's per capita industrial product accounted for half the world average in 1960 and again in 1970, and this percentage may well not vary for 1980 if these variables are projected on the basis of the extrapolation of the trends observed during the last thirteen years (see table 5). Similarly, the situation of Latin America is hardly likely to improve in comparison with that of some industrialized countries - Canada and the United States, for example - the Latin American manufacturing product increased from 11.7 per cent to 12 per cent of the products of those two countries between 1960 and 1970, and could reach 13.2 per cent in 1980; the disparity would still continue to be considerable, however.

/Table 4

Table 4

LATIN AMERICA: PER CAPITA INDUSTRIAL PRODUCT
(In dollars at 1960 prices)

| | 1970 | 1973 |
|---|---|---|
| Group I | 150 | 180 |
| Argentina | 372 | 437 |
| Brazil | 89 | 120 |
| Mexico | 162 | 178 |
| Group II | 95 | 107 |
| Colombia | 69 | 82 |
| Chile | 155 | 163 |
| Peru | 86 | 99 |
| Venezuela | 105 | 121 |
| Group III | 46 | 52 |
| Central America | 54 | 58 |
| Haiti | 11 | 12 |
| Panama | 110 | 122 |
| Dominican Republic | 38 | 51 |
| Group IV | 63 | 67 |
| Bolivia | 26 | 28 |
| Ecuador | 54 | 65 |
| Paraguay | 56 | 58 |
| Uruguay | 151 | 142 |
| Latin America | 123 | 146 |

Source: ECLA, for the figures of the industrial product; for population figures, CELADE, Boletín Demográfico, Nº 13, January 1974.

/Table 5

Table 5

PER CAPITA INDUSTRIAL PRODUCT

| | 1960 | Index | 1970 | Index | 1975 a/ | Index | 1980 a/ | Index |
|---|---|---|---|---|---|---|---|---|
| World b/ | 171 | 1.00 | 271 | 1.00 | 341 | 1.00 | 429 | 1.00 |
| Canada and the United States | 717 | 4.19 | 1 021 | 3.85 | 1 219 | 3.56 | 1 617 | 3.77 |
| Western Europe | 318 | 1.86 | 498 | 1.83 | 624 | 1.83 | 781 | 1.87 |
| Latin America c/ | 84 | 0.49 | 123 | 0.45 | 161 | 0.47 | 212 | 0.49 |

Source: ECLA, on the basis of data taken from United Nations, Monthly Bulletin of Statistics and The Growth of World Industry 1969, August 1972.

a/ The projections to 1975 and 1980 were made on the basis of the trend observed between 1960 and 1970; for Latin America, on the basis of the trend observed between 1970 and 1973, which was higher than that of the previous decade.

b/ Excluding Albania, China, Mongolia, Democratic People's Republic of Korea and Vietnam.

c/ Excluding Cuba, Jamaica, Barbados, Guyana and Trinidad and Tobago (dollars at 1960 prices).

/The marked

The marked difference to be observed among the Latin American countries was aggravated in the first three years of the 1970s. The four medium-sized countries had a per capita manufacturing product which was equal to 63 per cent of the product of the three largest countries of the region in 1970, and 59 per cent in 1973; the next four countries had a product equal to 42 per cent in 1970 and 37 per cent in 1973, while the product of the smallest countries was equivalent to 31 per cent in 1970 and 29 per cent in 1973.

### 3. Industrial employment

During the first years of the 1970s, employment in the industrial sector of Latin America recorded a slight upward trend in growth, rather greater than the increase in the labour force and slightly less than the growth of the urban population.

Between 1950 and 1960 the growth of industrial employment was 2.7 per cent, during the period 1960 to 1970 it was 3.8 per cent and during the first three years of the 1970s it is estimated at approximately 4 per cent. The share of industrial employment in total employment has also changed very slowly, increasing from 14.7 per cent in 1960 to 16.4 per cent in 1970, and is estimated at around 17 per cent in 1973.

These overall indicators do not satisfy the expectations maintained some decades ago as regards the capacity of the manufacturing sector to absorb the natural increases in the labour force and its shifts from other economic activities. It is not easy to pinpoint the motives for these discrepancies between the expectations and the actual results of the industrial development process.

In the first place, they may be directly attributed to the inadequate growth rates of the industrial sector in the majority of the countries of the region. At the same time it is maintained that the industrial policy followed by the majority of the Latin American countries has also been influential; this has been based on excessive and prolonged protectionism and on strong incentives to stimulate national industrialization, and to some extent has distorted

the real cost of the factors of production by making it possible to acquire abroad high technology capital goods and consequently save labour.

On the other hand, the existence of great differences in productivity between the sectors of the economy and within each sector (between the branches making up the sector and even between the enterprises grouped in branches according to similarity of products), affects the demand for labour by the production techniques used, at the level of wages and relative prices. This means that the base of the apparatus of production in Latin American industry is characterized by a strongly marked heterogeneity. This is accentuated in the course of time and is expressed through the coexistence of establishments with considerable disparities in their capital formation, scales of production, technologies used, productivity, employment, remunerations, etc., even within a single branch of production, i.e., among establishments devoted to producing similar goods. Without going any more deeply into the definition of this heterogeneity and its consequences for employment, it suffices to mention as an example that the co-existence of two strata of production, manufacturing and artisan-type industry, in which the product per employed person ratio is generally five to one, complicates any prospect of calculating industrial employment for the future, since the artisan-type industry stratum takes in a large share of this employment and the creation of new jobs is necessarily slow owing to the features of production in this branch (low productivity, low rate of returns or both together) and of demand. On the other hand, the creation of new jobs in the manufacturing sector implies increasingly great financial efforts; lastly, it could satisfy part of its demand for labour by resorting to the artisan-type industry sector rather than to natural increases in the labour force or to labour which has shifted from other activities, owing to the greater aptitude and experience of the first-mentioned in manufacturing activities.

/The rate

The rate of growth of industrial employment given for the region is a result of very dissimilar situations in the various countries. Brazil, Bolivia, Mexico, Panama and Venezuela stand out for their high indexes, while other countries show fairly slow rates of growth. Brazil, Bolivia, Panama, Paraguay and Venezuela show a clear speeding up of their rate of absorption of industrial labour compared with the last decade, while this rate remains constant in the Dominican Republic and declines in Argentina, Ecuador and Uruguay. The information available does not provide any satisfactory explanation of each of these variations, particularly the more extreme cases.

Lastly, as far as the prospects of industrial employment are concerned, Latin America recorded an employment-elasticity of the product of 0.55 during the last decade, which is fairly high if it is compared with other developing regions. It is in fact higher than the coefficient for Asia which was 0.49 and the average for the developing countries which was 0.53.

If a projection is made of this growth rate of industrial employment and assuming that the growth target for the industrial product of 8 per cent postulated in the IDS for the Second Development Decade is achieved, industrial employment would increase its growth rate from 3.8 per cent to 4.7 per cent annually throughout the 1970s, while its share in total employment would reach 20.2 per cent by the end of the decade.

/4. Exports

## 4. Exports of manufactures 5/

### (a) Trends and features

Between 1970 and 1974 the value of exports of manufactures increased rapidly to exceed 7,800 million dollars in 1974, more than tripling the value for 1970 (see table 6). The rate of increase in these four years (37 per cent annually) was thus noticeably higher than that of the last half of the 1960s (19 per cent annually), and was due almost exclusively to the extraordinarily large increases in exports recorded in 1973 and 1974. Similarly, the value of total exports showed a notable increase in these years, particularly in 1974.

However, according to preliminary estimates aimed at excluding the influence of variations in exports prices, the evolution of the volume of total exports and export of manufactures has been very different. From 1970 to 1974 the volume of total exports increased at a rate lower than that recorded between 1965 and 1970, and tended towards a negative growth rate in 1974. On the contrary, the volume of exports of manufactures has shown an increasing tendency, since between 1970 and 1974 its growth rate was 22 per cent, compared with 17 per cent recorded between 1965 and 1970. This situation has meant that the share in terms of volume of exports of manufactures in total exports has increased from 15 per cent in 1970 to 29 per cent in 1974.

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5/ The definition of the manufactures used in this analysis is on that of UNCTAD as it appears in the document The Definition of Primary Commodities, Semi-manufactures and Manufactures (TD/B/C.2/3). However, in view of the aims of this analysis it was considered advisable to exclude petroleum products - groups 331.0 (2) and 332 of the Standard International Trade Classification, Revised - and non-ferrous metals (Division 68 of the SITC), which exclusions coincide to a large extent to those prepared by UNCTAD in later revisions of the original Definition. The definition adopted is broader than that used in previous documents, according to which the products included in Section 5 to 8 (excluding Division 68) of the SITC are considered as manufactures. With the adoption of this broader definition, an important range of products which were excluded when the definition based on the SITC was used were incorporated in the analysis. These include tinned foods, beverages, tobacco, cellulose, synthetic rubber, artificial fibres, asphalts, animal and vegetable oils and sawn woods, which are relatively important items in the region's external trade. However, for the lack of comparable data, it has been necessary to resort to the definition based on the SITC for some international comparisons.

/Table 6

Table 6

LATIN AMERICA: TOTAL EXPORTS AND EXPORTS OF MANUFACTURES 1970-1974

(Millions of dollars at current prices, rates and percentages)

| | 1965 | 1970 | 1971 | 1972 | 1973 | 1974a/ | Annual growth rates 1965-1970 | Annual growth rates 1970-1974 | Annual growth rates 1973 1974a/ |
|---|---|---|---|---|---|---|---|---|---|
| A. Total exports | 10 730 | 14 879 | 15 264 | 17 960 | 26 191 | 41 170 | 7 | 29 | 57 |
| B. Exports of manufactures | 950 | 2 220 | 2 425 | 3 300 | 5 030 | 7 860 | 19 | 37 | 56 |
| Share of exports of manufactures in total exports (percentages) | 9 | 15 | 16 | 18 | 19 | 19 | | | |

Source: ECLA.

a/ Preliminary estimates.

It may be seen from these preliminary observations that the price increases decisively influenced the values recorded for total exports in recent years, while the value of exports of manufactures, although also influenced by price increases, reflect at the same time a thriving performance, with an increase in the volume. The fragmentary figures available show that this progress made by industrial exports was led by sectors which have only recently come to take part in external trade, like the metal manufactures and machinery industry, and within this in particular, transport materials and non-electrical machinery, the paper and cellulose industry and - within traditional exports of manufactures - the textile, leather and food industries.

(b) Origin and destination of exports

Table 7 gives data on the evolution of exports of manufactures between 1970-1974 by groups of countries in the region.

The annual growth rate of exports in the region as a whole which is 37 per cent, follows, as may be seen, the tempo set by the exports of the largest countries, which thanks to a spectacular annual growth rate of 43 per cent came to account for nearly 80 per cent of the region's exports in 1974.

The considerable growth of Argentina's exports in 1974 was influenced by exports of transport materials and machinery in general, since partial data for that year show a drop in the volume of processed meats exported. A wide range of products makes up the growth of Brazil; generally speaking, during 1974 the growth of exports came from the traditional industries as well as the newest industries. There were thus increases in exports of processed coffee, footwear, processed meat, tanned hides, cotton yarns, etc., and also in exports of transport materials, boilers and machinery and mechanical appliances, electrical machinery, office machines, etc. In Mexico, the range of articles which showed notable increases in 1974 was rather smaller; there were, however, notable improvements in exports of machinery and mechanically operated or electrical appliances, private cars, and spare parts and components for transport vehicles, toys, musical instruments and, among the most traditional articles, appreciable increases in cotton fabrics and articles of clothing.

/Table 7

Table 7

LATIN AMERICA: EXPORTS OF MANUFACTURES BY GROUPS OF COUNTRIES, 1970-1974 AND 1965-1970

(Millions of dollars at current prices, percentages and rates)

| | Year | Value of exports | Relative share (percentage) | Annual growth rates 1965-1970 | Annual growth rates 1970-1974 |
|---|---|---|---|---|---|
| Latin America | 1970 | 2 220 | 100 | 19 | 37 |
| | 1974 | 7 860 | 100 | | |
| Large countries a/ | 1970 | 1 475 | 66 | 21 | 43 |
| | 1974 | 6 117 | 78 | | |
| Medium-sized countries b/ | 1970 | 233 | 11 | 13 | 39 |
| | 1974 | 874 | 11 | | |
| Remaining countries c/ | 1970 | 512 | 23 | 14 | 14 |
| | 1974 | 869 | 11 | | |

Source: Yearbooks of external trade of the countries, LAFTA publications and part estimates by ECLA for 1974

a/ Argentina, Brazil and Mexico.

b/ Colombia, Chile, Peru and Venezuela.

c/ Bolivia, Ecuador, Paraguay, Uruguay, Panama, Dominican Republic, Barbados, Guyana, Jamaica, Trinidad and Tobago and the countries of the Central American Common Market.

/Among the

Among the medium-sized countries mention may be made of the notable increases in Colombia's exports of textile products, mainly to the United States market, and wood manufactures; the recovery and notable increase of Chile's exports of cellulose and paper; the increase in Venezuela's exports of steel products and petrochemicals, and in Peru of fish oils and conserves.

In the remaining countries, including the relatively less developed countries, the increases which took place in Ecuador and Paraguay and the CARIFTA countries were not sufficient to offset the slower growth of the exports of the Central American Common Market (textile products, simple chemical products and clothing and footwear). Consequently, a growth rate for these countries as a whole of 14 per cent was recorded between 1970 and 1974, and the share of this group in total exports of manufactures in the region dropped from 23 to 11 per cent.

As far as the destination of exports of manufactures is concerned, the proportion of manufactured products which Latin America destined for the region itself, i.e., intra-regional trade in these goods, began to decline. This was influenced by the extraordinary impetus acquired by exports of manufactures by the major countries of the region towards other world markets. Previous to 1970, the continued growth of Latin America's position as a receiver of its own exports of manufactures was due to a large extent to the activity of the regional integration systems - LAFTA and CACM - which tended to slow down around 1970, coinciding with a sharp increase in the demand for Latin American manufactures from outside the region. It should, however, be mentioned that Latin America continues to be an important market for the manufactures coming from the metal-manufactures and machinery industries of the region itself.

The shift of exports out from the region was basically due, as has already been said, to the exports of the large countries; in the small and medium-sized countries, with the exception of Colombia, trade in manufactures inside the region tended to predominate.

/Among the

Among the extra-regional markets the United States continued to be first in importance, and in 1972 absorbed over 40 per cent of the manufactures exported. It is followed by the United Kingdom (6 per cent) and the Federal Republic of Germany (4 per cent).

Trade with the socialist countries and other developing regions continues to be of little importance: Africa and Asia for example received less than 1 per cent of exports of manufactures and the socialist countries did not achieve 2 per cent.

(c) Exports and the industrialization process

In 1973 and 1974 the share of exports of manufactures in the value of the total exports of the region at current prices was 19 per cent; in the world market this share was 68 per cent and in the developed market economy countries it was 79 per cent. These last-mentioned countries, which generate 61 per cent of the world manufacturing product, produce 85 per cent of world exports of industrial products, while Latin America, which generates 3.4 per cent of the manufacturing product, has a share of nearly 1 per cent in exports of this type of goods.

The share of exports of manufactures in the manufacturing product in 1972 was 7 per cent in Latin America compared with 40 to 50 per cent in the European countries, Japan and Canada. Although this percentage shows how little still the regional industrialization process is open to the world market, it has been increasing in recent years (the estimate for 1973 is 8 per cent) as has also the contribution of exports of manufactures to the growth rate of the industrial product; this may be estimated at around 1 per cent. Furthermore, the tempo of exports of manufactures in recent years suggests that this outward-directed movement could be considered as an authentic pattern of development in several countries of the region, particularly the largest, since in certain branches of industry its importance is considerable.

Two small considerations should be mentioned here. First of all, the increasing growth of exports of manufactures in recent years was the result of broad-based efforts made by the countries, at the domestic

/level, in

level, in connexion with aspects of supply, and in the search for better conditions of access to the importer markets; the international situation also played a beneficial role here. Secondly, the countries of the region, for various reasons, have made very little use of the Generalized System of Preferences. Among the restrictive measures which have caused concern in the countries of the region as regards this system, is the lack of continuity or permanence in some of its operational norms.

## 5. Investment and finance

### (a) Investment

During the first years of the decade, the relatively low level of capital formation in Latin American industries taken as a whole would appear to have persisted. This problem is common to all the sectors of economic activity and, as is well known, is a considerable obstacle to the development of Latin America.

No up to date data is available on investment in the manufacturing sector. The only statistical data available concern fixed capital investment classified by types of capital goods and only exist for some Latin American countries. In order to obtain a pattern of investment in the manufacturing sector the values of investment in machinery and other equipment have been taken as indicators.6/

Table 8 was prepared on the basis of these figures and shows gross investment in machinery and equipment in some countries of the region as a percentage of the gross domestic product. It may be seen that the figures for the majority of the countries show an upward trend between 1969 and 1973 in relation to the values of the gross domestic product or are maintained with no important changes. Some countries, however (Chile, Nicaragua, Peru, Uruguay), show relatively large decreases in investment compared with the gross domestic product.

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6/ The figures for investment in machinery and equipment would appear to be the most appropriate to replace investment figures for the manufacturing sector. Investment in transport materials is not included, although investment in other equipment not used in industry does appear.

/Table 8

Table 8

LATIN AMERICA: COEFFICIENT OF GROSS FIXED INVESTMENT IN MACHINERY AND EQUIPMENT WITH RESPECT TO THE GROSS DOMESTIC PRODUCT

(Percentages on the basis of constant values at 1970 prices)

| Country | Decade a/ | Second Half b/ | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|
| Argentina | 8.5 | 7.5 | 8.9 | 9.4 | 9.8 | 9.5 |
| Bolivia | 5.8 | 9.0 | 7.3 | 7.9 | 5.2 | 7.5 |
| Brazil | 9.1 | 7.3 | 12.2 | 13.0 | 14.7 | 16.2 |
| Colombia | 9.2 | 7.2 | 8.0 | 8.1 | 7.8 | 7.9 |
| Costa Rica | 7.9 | 11.3 | 12.9 | 13.4 | 13.1 | 13.5 |
| Cuba | | | | | | |
| Chile | 5.4 | 5.5 | 6.8 | 5.2 | 6.3 | 6.0 |
| Ecuador | 6.4 | 3.8 | 10.8 | 11.2 | 7.7 | 6.7 |
| El Salvador | 8.7 | 9.8 | 6.8 | 6.9 | 6.6 | 6.8 |
| Guatemala | 5.9 | 7.7 | 8.3 | 8.8 | 8.6 | 8.1 |
| Haiti | 1.6 | 2.2 | 2.8 | 2.8 | 2.8 | 2.9 |
| Honduras | 3.9 | 6.2 | 9.1 | 7.5 | 4.7 | 5.5 |
| Mexico | 8.0 | 8.6 | 9.0 | 8.7 | 8.5 | 8.4 |
| Nicaragua | 6.9 | 10.8 | 9.1 | 8.8 | 8.1 | 7.7 |
| Panama | 5.4 | 7.4 | 12.2 | 10.5 | 11.3 | 11.8 |
| Paraguay | 6.5 | 8.0 | 7.2 | 6.7 | 7.4 | 8.1 |
| Peru | 6.0 | 8.1 | 6.8 | 6.8 | 6.3 | 6.5 |
| Dominican Republic | 3.0 | 2.7 | 6.7 | 7.6 | 6.6 | 6.6 |
| Uruguay | 3.2 | 3.0 | 4.6 | 3.9 | 2.0 | 1.7 |
| Venezuela | 11.8 | 9.7 | 9.1 | 10.2 | 11.1 | 10.3 |
| Latin America (excluding the Caribbean) | 8.2 | 7.6 | 9.6 | 9.9 | 10.5 | 11.0 |
| Barbados | | | | | | |
| Guyana | | | | | | |
| Jamaica | | | | | | |
| Trinidad and Tobago | | | | | | |
| Latin America | | | | | | |

a/ 1960-1969.

b/ 1965-1969.

/The lack

The lack of data on fixed capital investment in some countries deprived the average values which could be obtained for the group of countries selected and the growth rate estimated on this basis for the entire region, of their importance. In any case, the figures given in the table would suggest that investment in the region's manufacturing sector has increased more rapidly than total gross investment, which as has been shown, was 7.8 per cent annually in 1969-1972. In view of the close relationship existing between the investment and the product, it may be said that the resources destined for investment were sufficiently large to increase the growth rate of the product of the region's manufacturing sector well beyond the target laid down in the International Development Strategy for the Second United Nations Development Decade. This could not be said, however, if the problem of industrial investment were analysed by countries, since, as has already been said, very few have achieved the target fixed for the annual growth of the sector (8 per cent).

(b) Financing

Data on the financing of the manufacturing sector in Latin America are also extremely scarce. Insofar as an analysis is possible, however, they would appear to confirm some general conclusions of studies 7/ made during the 1960s on the basis of surveys in various countries of the region.

The scanty data available would seem to indicate that in recent years the low share of the industrial enterprises in the self-financing of investment would appear to have been maintained in some countries. A survey 8/ made some months back in the manufacturing sector in Colombia brought out the little relative importance of industrial reinvestment in this country, and showed that during the first three years of the 1970s its importance as an element in the financial structure of the enterprises of this sector had decreased.

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7/ United Nations, ECLA, The process of industrial development in Latin America, United Nations Publication, Sales Nº: 66.II.G.4, 1965.

8/ FEDESARROLLO, Encuesta industrial, 1974.

/The results

The results of the above-mentioned survey as far as the financing of the manufacturing sector is concerned are shown in table 9, which gives the percentage figures of the amounts invested in Colombian industry in 1972 and 1973, and an estimate of the percentages of the investments which will have been made in 1974, according to the different sources of funds. In addition, a glance at the table will show that there exists appreciable differences in the structure of the financing of different sized enterprises. The survey would appear to show that in Colombia it is the medium-sized enterprises which most use the reinvestment of profits as a source of finance. No data are available for the small enterprises; but although the figures for the reinvestment of profits were included under the heading "other resources", it is obvious that they are of very little importance; the same could be said of the depreciation allowances,9/ the figures for which do not specifically appear in this table.

The results of this survey coincide with the conclusions of other research carried out during the 1960s and which tended to suggest that in Latin America, generally speaking, the funds coming from internal sources of the industrial enterprises constitute a smaller share of the total funds earmarked for capital formation or expansion than is the case in industries in Europe and the United States.

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9/ The structure of self-financing in terms of undistributed profits and depreciation allowances usually varies very much from country to country and in the course of time. Although depreciation allowances are usually similar in different countries, and in these countries and the developed countries, the actual sums set aside for this purpose are frequently very small, since on account of inflation and also obsolescence, the available capital to which these rates are applied constitutes an increasingly smaller fraction of the replacement cost of these fixed assets.

/Table 9

Table 9

COLOMBIA: FINANCING OF INVESTMENT AND SHARE BY SOURCES OF CREDIT a/

(Percentages)

| Industry | Year | Sources of credit | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Credit from commercial banks | Development credits b/ | Issue of shares | Issue of bonds | Reinvestment of profits | External credit | Credit other than from banks | Other resources | |
| Small-scale c/ | 1972 | 47.6 | 37.5 | - | - | - | - | - | 14.9 | 100 |
| | 1973 | 41.4 | 43.7 | - | - | - | - | - | 14.9 | 100 |
| | 1974 | 35.3 | 49.8 | - | - | - | - | - | 14.9 | 100 |
| Medium-scale d/ | 1972 | 16.2 | 37.1 | 1.0 | - | 35.4 | 1.0 | 5.6 | 3.7 | 100 |
| | 1973 | 24.7 | 37.1 | 1.0 | - | 21.8 | 6.3 | 2.8 | 6.3 | 100 |
| | 1974 | 16.6 | 38.3 | 2.8 | - | 28.6 | 2.8 | 1.9 | 9.0 | 100 |
| Large-scale e/ | 1972 | 21.0 | 19.1 | 4.6 | 3.1 | 24.8 | 22.0 | 1.2 | 4.2 | 100 |
| | 1973 | 14.6 | 22.9 | 2.5 | 15.4 | 21.4 | 13.9 | 1.3 | 8.0 | 100 |
| | 1974 | 15.0 | 28.2 | 6.2 | - | 19.8 | 26.2 | .9 | 3.7 | 100 |

Source: FEDESARROLLO, Encuesta industrial, 1973.

a/ Weighted by the share of each enterprise in the value of the sales of the group to which it belongs (small-scale, medium-scale and large-scale industry) in 1972, for the sample.

b/ Through specialized bodies.

c/ Less than 10 million pesos worth of sales in 1972.

d/ Between 10 and 100 million pesos worth of sales in 1972.

e/ More than 100 million pesos worth of sales in 1972.

/If it

If it is borne in mind that one of the factors which determine this low level of reinvestment in the Latin American enterprises is constituted by the phenomenon of inflation 10/ which, particularly during the 1970s has affected nearly all the countries of the region to a significant extent, the conclusions of the survey made in Colombia could be generalized. There are, however, some reasons which forbid such a generalization. In Peru, for very particular reasons, the self-financing of the industrial enterprises, has revealed other features during the last two years. Thanks to certain measures of what is known as the Ley de Comunidades Industriales (Industrial Communities Law), the reinvestment of profits in the manufacturing sector would appear to have increased remarkably during 1972 and 1973, reaching figures of the order of 80 per cent of total investment in the sector.

As regards the financing of the sector over the last four years in other Latin American countries, no data is available. Data is, however, to be had on the sources of industrial financing in Argentina and Brazil for the latter years of the 1960s; they show that during this period in both countries reinvestment was the most important source of resources for the manufacturing enterprises (accounting for around 50 per cent of the total) and there are no indications that this percentage has changed substantially during the 1970s in any of the countries mentioned.

This would appear to show that self-financing has not had the same importance in the different countries of Latin America.

In view of the differences as far as self-financing is concerned, the industrial enterprises of the region have had to resort to varying extents to external sources, i.e., to credits from the national banking system, to the securities markets and to investment and loans from abroad.

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10/ Another factor which may have had considerable influence during some periods and in some countries at the level of internal financing, is the flight of resources generated in the enterprises to other countries, mainly in the developed world.

/During the

During the first years of the 1970s, the banking system of each country constituted one of its main sources of industrial financing. Generally speaking, the enterprises use credits from commercial banks in order to satisfy their operating capital requirements and go to the industrial development banks which exist in nearly all the countries of the region in order to obtain credits to satisfy their investment requirements. In not a few cases, and sometimes on account of problems of access to bank credit, the enterprises also resort to credit other than from the banks. Generally speaking, this means a larger outlay, but it usually involves more operational mobility and less requisites and formalities in requests for it.

The above-mentioned survey shows that in 1972 and 1973 Colombia's small enterprises financed around 85 per cent of their capital requirements with credits from official banks and development credits from specialized bodies. Credit other than from the banks was apparently not used. The medium-sized enterprises financed their investments basically by means of development credits, and made use of credits other than from the banks to a larger extent. In connexion with national banking sources, large-scale industry also made more use of development credits which, as may be seen from the table, achieved percentages similar to those for credits from abroad.

The marked importance of the national banking system in financing Colombian industry is closely linked with the weakness in the sources of internal funds used by the enterprises, and to some extent brings out the existence of a noticeably favourable attitude to the allocation of credit resources to the manufacturing sector.

Sufficient evidence is not available to confirm that the national banking systems of other countries of the region during the first years of the 1970s similarly shared in financing the sector; but it can be said that according to their various levels, the industrial sectors of the countries have tended in a fairly generalized form to use increasing quantities of resources from the banking system and in particular from what are known as the official development banks.

/The securities

The securities markets constitute another source of finance for the industrial enterprises in some countries of the region; but the volume of the funds which they contribute to the sector has continued to be of little importance during recent years compared with those coming from other sources; most stock selling operations continue to take place outside the securities markets.

Investments and loans from abroad constitute another important source of industrial financing in the region. Official external financing - public credits from multilateral and bilateral sources - and private external financing, mainly made up of direct private investment and private and suppliers' credits, should be clearly differentiated.

Up-to-date data on net entries of foreign capital from official and private sources to the countries of the region is not available either. However, it may be said that during the 1970s to date Latin America has continued to receive large financial contributions from abroad, although according to some estimates these would appear to be decreasing in proportion to the gross domestic product of the countries. It is probable that the relatively high levels of the Latin American public debt influence this.

The industry of the region has continued to receive substantial contributions of external financing. Between 1969 and 1973 suppliers' credits would appear to have increased their share in the structure of external financing. In addition, the Latin American Governments have made possible the increased financing of imports by means of agreements with banks in countries supplying machinery and equipment, with a view to setting up lines of credit under predetermined conditions to assist the industrialists of the developing countries in acquiring and paying for foreign equipment.

Direct private investment in Latin American industry by the United States and other countries of the Western hemisphere, excluding Canada, amounted to around 274 million dollars in 1970, 378 million in 1971 and 566 million in 1972, according to data supplied by the United States Department of Commerce. It should be mentioned that these figures

/include the

include the reinvestment of profits, which was 228 million dollars in 1970, 240 million in 1971 and 367 million in 1972.

As regards loans by private banks to the industries of the region, the data for the first two years of the 1970s shows that their share in industrial financing has also increased, and there are no indications that this trend underwent any change in the next two years.

However, since mid-1974, a large and increasingly marked decline in the long and medium-term credit available for industry, and especially suppliers' credit, has been observed.

This decline in available industrial financing is to a large extent connected with the world petroleum crisis which took place at the end of 1973 and which took the form of a transfer of monetary liquidity towards the petroleum-exporting countries, and large-scale changes in the terms of external financing. Some of the petroleum-producing countries shifted a large part of the funds accumulated thanks to the increase in petroleum prices into short-term placements in the international banking system. Consequently, industry in the region is meeting with daily increasing difficulties in obtaining credits with repayment periods suited to their payment possibilities.

Some decrease in the bilateral financing of industry is to be noted in external official financing, and there are no reasons to expect any modification of this trend in the next few years.

Multilateral industrial financing in the region, however, has shown some growth. Mention may be made here of the activities of the body known as the World Bank Group in financing the sector; although its share in total industrial investment has been small, its direct contribution accounted for a significant percentage of external public financing and indeed of the total from all external sources. Between 1969 and 1973 the World Bank Group undertook commitments to support the industrial sector in Latin America (including mining) for an annual average sum of 96.4 million dollars. In 1972 its commitments amounted to 279 million, in 1973 to 80 million and 1974 to 76.2 million dollars.11/

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11/ World Bank, Annual Report, 1974.

The Inter-American Development Bank (IDB) also had an important share in the industrial financing of Latin America in recent years, since its contribution to the sector had increased significantly compared to previous periods. The percentage of IDB loans to industry and mining was 7.3 per cent of the total loans granted in 1970, 7.4 per cent in 1971, 19.8 per cent in 1972 and 19 per cent in 1973.

## 6. Industrialization policies

### (a) Medium-term industrialization policies

Nearly all the countries of the region have prepared development plans which cover the development of the industrial sector, in some cases in a global form, and in others in more detail, fixing the policy objectives in the medium-term by setting growth targets for the different branches of manufacturing. In these overall frameworks of development, the Latin American countries, which have not ceased to apply import substitution policies, have recently tackled other modes of industrial development through policies aimed at promoting exports of manufactures, expanding local markets and achieving greater sub-regional integration. It may be said that one of the features of the industrialization policies which the Latin American countries have applied in the 1970s so far is the multiplicity of their objectives. These objectives usually have a sufficient level of complementarity and consistency to provide, generally speaking, down-to-earth answers to the problems and restrictions which stand in the way of the industrial development of each country. The main industrial policy objectives in force during the first four years of the 1970s in the countries of the region are:

(i) Import subsitution in respect of industrial goods. Import substitution continued to be one of the main objectives of the policies in force in Latin America. Although it is considered in several countries of the region that the substitution model the features and limitations of which are described elsewhere in the present report ceased to be an active factor of industrial development long before the beginning of the 1970s, the maintainance in these and the other

countries of protectionist policies - in some cases in an attenuated form or with new directions - bring out the existence and therefore the permanence of import substitution as an objective of industrial policy.

Obviously, the existence of the import substitution model and objectives shows different features according to the country's level of industrialization, the structure of the sector and other economic variables. In countries like Argentina, Brazil and Mexico, which have achieved a high degree of industrialization and where the possibilities of import substitution in respect of consumer goods has been practically exhausted for several years, the aim of import substitution covers intermediate and capital goods, and is usually described as the vertical integration objective of industry.

In the different industrialization programmes of the various countries in force during the period under consideration, the development of the industries producing intermediate goods (steel industry, heavy chemicals, petrochemicals, cellulose) and capital goods, which generally involve an intensive substitution process, was expressly cited as an objective. In 1972 and 1973, import substitution in respect of capital and intermediate goods acquired further importance as a policy objective in the countries mentioned, on account of the scarcity and price increases of inputs and the difficulties which have emerged in connexion with buying machinery and equipment abroad.

Mention should be made of the high priority which has been given in these countries to developing the capital goods industry, on account of the strategic position which this branch of manufacturing occupies in the different economies; it not only offers possibilities for import substitution, but also (especially in Argentina and Brazil) good export possibilities, it generates a large demand for skilled labour and, basically, is associated with the technological development of the countries in view of its nature as an activity which incorporates, produces and disseminates technologies.

/The priority

The priority objective of the countries of intermediate development is also import substitution in respect of some intermediate and capital goods, and they have formulated and applied policies as well as maintaining policy measures aimed at completing import substitution in respect of consumer goods.

In the countries at a relatively lower stage of industrial development the objectives formulated in industrial plans, or towards which the current policies tend, are also connected with selective import substitution in respect of products in their first stages of processing.

On the other hand, the tariff policies of the sub-regional integration agreements existing between Latin American countries and, basically, the commitments of joint sectoral programming, also aim at substitution objectives at the sub-regional level, which would seem to suggest that the substitution model is acquiring a new lease of life as the driving force of manufacturing development at other levels.

(ii) Exports of manufactures. The export of manufactures had, since the 1960s, constituted an industrial policy objective common to nearly all the countries of the region. This is because exports are a form of expanding the market and alleviating the external bottleneck which has in so pronounced a form affected the economic and industrial development of the Latin American countries. Although export development also has positive influences on industrial costs (economies of scale) and efficiency in production, the basic reason which has driven the majority of the countries to formulate policies to develop their exports of manufactures would appear to have been their need to improve their balance of payments situation.

The instruments of promotion have mainly predominated here over those intended to influence the features of industrial production in order to adapt it to the requirements of the external market. Put in another way, it could be said that when the policy measures for developing exports of manufactures were drawn up, no sufficient consideration was given to the type of industrial development which

/it was

it was desired to promote, the foreseeable effects of these exports on the structure of industry, their effect on employment, the significance of the share of transnational enterprises in this type of exports, the contribution to national technological development, etc.

This perhaps explains why countries with very different levels of industrialization and which are therefore in very different circumstances as far as the supply of products and the possibilities of satisfying the requirements of the international markets are concerned, have introduced very similar measures aimed at developing exports of manufactures.

Naturally, the results have also been very different, since only the most industrialized countries have succeeded in making significant exports.

It should also be mentioned that at least in the countries of higher industrial development in the region, the measures for promoting exports (tariff, tax and credit incentives), have been in force since the 1960s. However, the increase in exports of industrial products became really significant in recent years, and in particular as from 1972, when the scarcity of many raw materials and industrial goods and their price increases began to be felt at the world level.

This extraordinarily large increase in exports of manufactures may constitute the expression of a permanent change in the trend of production and trade management in at least some branches of industry in the Latin American countries, with all its implications for their respective industrialization processes. But it is difficult to be categorical in this respect, since such a trend in the measures applied by the majority of the countries of the region to expand their exports of manufactures is still not clearly visible. There is a risk that the extraordinary increase in exports of industrial products only constitutes a circumstantial shift of domestic supply towards exports - in some cases to the detriment of domestic supplies - that its continuity depends on how great are the incentives for export promotion, and that the effects of the economic situation on international prices will not undergo any important changes.

/To some

To some extent, the future of the manufacturing sector of the countries as far as exports are concerned depends on the formulation and appropriate application of export promotion policies; these should be based on the resources available in each country, on present and potential possibilities for the industrial sector to satisfy the qualitative and quantitative requirements of the international markets and on a realistic estimate of the trend and probable evolution of these markets in the medium and in the long-term, and should tend to develop such branches of industrial activity as may possibly compete successfully in the world or regional markets. Some countries would appear to be adopting measures along these lines.

(iii) Other objectives. Some other objectives, towards which the policies of the countries of the region tended to a greater or lesser extent, were: industrial decentralization, rationalization and industrial efficiency, the employment of labour, support to the small and medium-sized enterprises, and the increased power of national decision-making in the sector, through technological development policies and policies for dealing with foreign capital. In addition to these there are others which, although they are not general in the region, when considered together with the above-mentioned, show the pattern of changes which are taking place in the trend and strategy of industrial development in Latin America. These are, for example, the promotion of the mass production of generalized consumer goods to satisfy the requirements of large sectors of the low income strata of the population; the control of the growth of some branches of industry, such as the motor-vehicle industry, and the safeguarding of the environment, which are featured among the industrial policy objectives of some countries of the region.

(b) Policies in respect of the economic situation

Lastly, and complementing the medium-term industrialization policies, the countries of Latin America have had to adopt a series of policies in respect of the economic situation so as to protect themselves from the present problems affecting the world economy.

/The scarcity

The scarcity and the extraordinary price increases of raw materials and industrial inputs and of capital goods certainly constitute the most important current economic problems faced by the industrial sector in Latin America during the first four years of the Second United Nations Development Decade.

These problems began to appear in 1972 and were aggravated throughout the years 1973 and 1974, but did not affect all the countries to an equal extent.

The different degrees of industrialization, the differences in the structure of production, the different levels of vertical integration in the industries and the greater or lesser extent to which raw materials and inputs of national origin are available in the countries of the region, only partly explain the varying importance of the above-mentioned problems connected with the current economic situation.

It should also be recalled that these problems appeared at a time when the external trade of the countries of the region was showing considerable variations in price levels and systems, with very different effects on the economies of the different countries.

Thanks to the changes in the volume, prices and even the structure of their exports, some have experienced a sustained and in some cases exceptional growth in their foreign exchange reserves.

In others, on the other hand, the external bottlenecks have been seriously aggravated, while the rest showed varying degrees of positive and negative repercussions, the balance of which it is still difficult to estimate.

The petroleum crisis at the end of 1973 accentuated still further the position of the different countries, in terms of how much or how little petroleum they had available and the requirements of domestic consumption.

All these circumstances have, of course, had repercussions on the development of the industrial sector.

Thanks to them, some countries have significantly increased their exports of manufactures. Although the export promotion policies were also influential here, it should be mentioned that in several cases

/they had

they had been in force since the previous decade, with not entirely satisfactory results. It is therefore not too much to say that the economic situation has been an important factor in the large increase in exports of manufactures.

Other countries, however, with a lower degree of industrialization, found themselves adversely affected by the increase in the prices of industrial inputs (particularly steel inputs and products of petrochemical origin) and capital goods. However, this situation did not have the same features in all the countries. Those more favoured by the increase in the prices of their exportable products, particularly the exporters of petroleum, found themselves in a better position to apply defence policies in the face of the adverse effects of the economic situation than others, where the higher export earnings were not sufficient to offset the greater outlay on imports of industrial goods or petroleum.

For these reasons, the policies applied by the countries to deal with the economic situation and in connexion with industry have also been different.

In the industrial enterprises the situation described had considerable repercussions and produced changes in the modus operandi of the industries.

The difficulty of obtaining raw materials and inputs has caused the enterprises to modify some basic principles of their management and to acquire the raw materials and inputs required at any price, so as not to reduce or paralyze output. Despite the increase in prices, the demand for manufactures has not decreased, and this would justify the attitude of the enterprises.

The maintenance and even the increase in the demand for manufactures has been influenced by the increase in exports, and possibly also by the generalized aggravation of inflationary pressures in the majority of the countries of the region; until recently the problem was limited to only some Latin American countries.

/In 1972

In 1972 fairly large increases in the domestic prices of several countries began to appear, even in countries which had traditionally demonstrated relative stability. This state of affairs was intensified in 1973 and 1974, and spread to nearly all the countries of the region. The increase in international prices and inflation in the industrialized countries, transmitted through imports of industrial goods, contributed to speeding up the inflationary process in Latin America.

The consequence of all this was not only a significant increase in costs, and hence in the prices of industrial output, but also the fact that in many cases the industries found themselves unable to satisfy the demand for their products owing to the scarcity of raw materials and inputs.

Another important repercussion at the enterprise level is the change in the stocks policy. The practice of maintaining prudent stocks of raw materials so as not to affect the liquidity of the enterprise began to prove awkward. The entrepreneurs found themselves obliged to buy the largest possible quantities of foreign inputs so as to ensure the normal functioning of the enterprise and protect themselves against the price increases in inputs. On the other hand, the increase in stocks meant an increase in operating capital and thus increased the demand for short-term credit from the countries' banks.

As far as the effect of the new situation on industrial investment is concerned, although the increase in prices and the scarcity of some products has provided a considerable incentive for setting up or expanding industries producing such goods, in no few cases the increase in the prices of capital goods and in particular the long delivery dates for equipment have discouraged possible investors.

The classical balance of payments deficit of the majority of the Latin American countries led to the application in most of them of import policies restricting free imports of goods, including industrial inputs, to a greater or lesser extent. The new situation created as a result of the changes which took place in international trade after 1972, required the countries to make basic modifications in their economic policies, particularly in connexion with industrial supplies.

/In many

In many cases, however, these policy modifications did not take place at the right moment, but perhaps because the nature of the changes which took place in international trade and their importance for the economies of the countries had not been properly understood, they were applied after considerable delays, and thus caused damage which could have been avoided.

These delays may be justified, however, by pointing out that the size and nature of these changes have generally surpassed the possibilities which existing instruments of economic policy have of adjusting their margins, and require the creation of policies with a new perspective and other objectives. It takes time to analyse these, and in view of the fragmentary nature of the facts available this gives rise to queries which are difficult to answer, and makes any decision on the policy modifications required by the new circumstances very hard.

As has already been said, the changes in industrial policies which have emerged in the countries in the face of the problems arising out of the economic situation vary according to the individual situation of each country as regards the foreign exchange available and the degree, structure and level of industrial integration. In the countries benefiting from the new external situation, in general policy measures aimed at abolishing restrictions on imports of industrial goods, particularly raw materials and inputs, were adopted. In Argentina, for example, not only were existing restrictions on these imports abolished, but credits were also granted to user enterprises in order to make the supply adequate for their requirements possible. Ecuador did the same. At the same time, measures were taken to avoid the speculation which generally emerges in a period of commodity scarcity. A system of multiple exchange rates was also applied for the acquisition of what are known as critical inputs, and this made it possible to maintain the prices of final products manufactured with imported inputs within certain limits.

Naturally, the countries adversely affected by the new situation also had to revise their import policies, although with smaller margins

/for manoeuvre,

for manoeuvre, and endeavour to correct the disequilibria in their balance of payments and grant priorities for imports of inputs required for the maintenance of industrial activity.

The world scarcity of some industrial inputs has meant that some countries have made agreements with nations producing these inputs, in some cases on a barter basis, to ensure supply.

Lastly, although it does not constitute a policy in respect of the economic situation but rather a reaction to the circumstances, some countries have modified their industrial output plans and have granted special facilities and incentives for the manufacture of some industrial goods of which supplies are scarce in the market.

## 7. The integration systems and industrialization

During the first years of the 1970s the two oldest integration systems - the Central American Common Market (CACM) and the Latin American Free Trade Association (LAFTA) - met with serious difficulties which interrupted the progress which had been recorded in one way or another during most of the previous decade. This was very plain to see in CACM, whose advance was steady and uninterrupted until approximately 1968 or 1969. In LAFTA the first serious difficulties emerged more or less around the same date, following relatively less important progress than in CACM.

The signing of the Cartagena Agreement in 1969, which gave rise to an integration system within LAFTA with the participation of the Andean countries, is typified by the adoption of more binding formulae than in the central system in order to achieve the ends proposed. Its emergence was linked to a large extent with the difficulties already mentioned in the operation of LAFTA.

The Caribbean Community (CARICOM), the common market of the Caribbean sub-region which was set up in 1974 and which for the moment coexists with the Caribbean Free Trade Association (CARIFTA), constitutes the most recent manifestation of the tendency for the countries to join together in order to seek in group form means or ways of speeding up their industrial and economic development.

/It should

It should be mentioned that the two oldest integration systems reached a relative standstill after following very dissimilar paths.

After a first stage of sustained progress, CACM speeded up its rate of economic development and in particular was a decisive influence on the transformations which took place.

Suffice it to mention some basic economic indicators of the period 1960 to 1970 to confirm this:

- Intra-area increased as a percentage of total trade from 6 to 25 per cent and the percentage for 1971 (see table 10) was also of this order.
- The share of the area's supply of manufactures covered by intra-area imports increased from less than 2 per cent to nearly 10 per cent.
- The share of export in the gross value of industrial output increased from 2 to 14 per cent.

Furthermore, according to estimates 12/ a quarter of the increase in the product between 1962 and 1968 may be attributed to the operation of the area market whose trade was almost entirely made up of industrial products.

To sum up, in the first years in which CACM functioned, the industrial sector took on a tempo which none of its member countries had known up till then, thanks to import substitution in respect of extra-area products.

It is interesting to note that during the 1960s the favourable performance of traditional exports to the rest of the world constituted an important element of support to economic activity, which made possible the adoption of national commitments and the channelling of private and public funds towards various regional activities and programmes.13/

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12/ Permanent Secretariat of the General Treaty on Central American Economic Integration (SIECA), El desarrollo integrado de Centroamérica en la presente década, IDB/INTAL, Buenos Aires, 1973, Volume I.

13/ See, The Central American Common Market and its recent problems E/CN.12/885.

/Table 10

Table 10

REGIONAL INTEGRATION SYSTEMS: DATA ON GROSS INDUSTRIAL PRODUCT AND EXTERNAL TRADE, 1971 AND 1972

(In millions of dollars at current prices)

| | LAFTA (1972) | CACM (1971) | Andean Group (1972) a/ | CARIFTA/ CARICOM (1972) |
|---|---|---|---|---|
| Gross manufacturing product (at market prices) | 37 298b/ | 1 007 | 5 423b/ | 473 |
| Total exports to the world | 13 985 | 1 107 | 3 210 | 1 156 |
| Intra-area exports | 1 578 | 276 | 154 | 121 |
| Intra-area exports of manufactures c/ | 738 | 248 | 75d/ | 56d/ |

Source: ECLA, on the basis of yearbooks of external trade and LAFTA publications.

a/ Not including Venezuela.

b/ At factor cost, in millions of dollars at 1960 prices.

c/ Manufactures according to definition adopted (see note 5/).

d/ Estimates.

/The improvement

The improvement in import capacity paralleled import substitution and had favourable effects on it. Neither this nor other conditions which existed in the case of Central America were present in LAFTA.

This is not the place to expatiate on the marked differences which existed between the two systems from the beginning, but mention may be made of some which contribute to explaining the dissimilar paths they have taken.

Considerable elements of homogeneity existed in the Central American countries, both in respect of the size of their markets and their position in the stages of industrial development; there also existed the decision to make for more binding formulae, possibly assisted by the circumstances already mentioned.

In LAFTA, however, made up by countries of very diverse potential and in very different stages of industrial development, the integration formulae which were explicitly accepted went no further than to ensure a gradual liberalization of the market, which would be achieved through annual negotiations and would reach its culmination after twelve years.

The combined action of all these factors, and other which it is not necessary to detail here, explains why, when serious difficulties appeared in both systems, the LAFTA process may be considered, generally speaking, as having been of less influence on industrialization in its own area than CACM in Central America.

The percentage of intra-area to overall trade in the LAFTA countries fluctuates between 11 and 12 per cent for exports, as may be seen from table 10. This situation was reached at the end of the 1960s, commencing with levels similar to those of CACM, i.e., around 6 per cent.

As from this moment the percentage share became stable and even dropped slightly. It may now be asked what the real significance of the trade in manufactures which exists in both systems is in terms of influence on the different industrialization processes.

As was foreseeable, in view of the stage of industrialization in which Central America was to be found, intra-area exports by this region contain a large proportion - around 45 per cent - of goods from the

traditional industries, while the remaining manufactures are rather composed of products with a low level of processing even when they come from industries producing intermediate goods and metal manufactures and machinery.

This trade meant, however, that when the integration programme began, the slow productive capacity of each of the Central American countries could be used more fully, and a better use thus made of the economies of scale, although it was not to be expected that any great diversification in import substitution would take place in so short a time.

The attempts made to create instruments which would channel the process along certain lines went no further; under the integration industries system, for example, only three factories were set up. The aspects which were really influential were free trade and the common external tariff, at the regional level, and the incentives to industry at the national level, but these latter did not always conform to regional interests.

It may be concluded that the main effect of CACM was to strengthen the already existing industries which produced traditional manufactures, and in particular textiles and clothing.

In the case of LAFTA, industrial exports increased much less rapidly than in CACM, partly because it had commenced at a higher level, but the predominance of manufactures from those industries generally regarded as thriving became more pronounced.14/

In 1972 they came to account for 83 per cent of total industrial exports; this compares favourably with the 1961 figure of 52 per cent.

The tempo of trade in manufactures in LAFTA is also in evidence when it is seen that in 1961 and 1972 industrial exports to the area increased more rapidly than exports of industrial products to the rest of the world and of non-industrial products to the area.

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14/ Active industries are considered to be those mainly producing intermediate goods, the industries of the metal manufactures sector and those known as "other manufacturing industries", i.e., those appearing in divisions 27 and 30 to 33, 34 to 38 and 28 and 29 of the International Standard Industrial Classification of all economic activities (ISIC), Revision 1.

/It should

It should not, however, be lost sight of that these volumes are fairly small compared with the total amount of trade. In 1972 intra-area exports accounted for 11.3 per cent of the value of total exports, while intra-area exports of manufactures accounted for 5.3 per cent of these (see table 10).

Comparing these trade figures with the estimates for the gross value of production, the first impression of the impact on the structures of production of the trade channelled by LAFTA tends to be unfavourable.

In CACM this proportion was around 14 per cent; in the group of the LAFTA countries it was around 1 per cent. If the problem is examined in connexion with specific sectors in which exports have been more active, the percentage increases appreciably, but does not reach levels which make it possible to affirm that a significant influence exists.

The Andean Group on the other hand depends basically on industrial programming which may assume two forms: sectoral industrial development programmes, for which the products of the most thriving sectors of industry have been reserved, and the rationalization programmes which will be applied to existing industry. In the case of sectoral programming, an important step was taken when a programme on the metal manufactures and machinery industry was approved, and at the present time another programme is being studied on this sector which would make it possible for Venezuela which recently joined the Andean Agreement to take part.

In intra-area trade exports have grown rapidly, from 86 million dollars in 1969 to 154 million in 1972 (see table 10), and to around 200 million in 1973.

Manufactures account for approximately half total intra-area exports: their value in 1972 was between 70 and 80 million dollars. The proportion is similar to that of LAFTA, but applied to much smaller quantities. Although no complete data are available on this subject, it would appear that the degree of manufacturing of exports is, generally speaking, lower than in LAFTA exports.

In any case this is incipient trade, and in addition to the fact that the programmes have not started this has meant that up to now

significant influences of the system on the area's structure of production have not been noted.

Like the Andean Group, CARIFTA/CARICOM has been operating for only a few years. However, the rate of growth of its trade appears to have been slightly more vigorous: in 1972 (see table 10), intra-area exports had exceeded 120 million dollars, compared with 54 million in 1968.

A very preliminary estimate reflected in table 10 already referred to showed that in 1972 intra-area exports of industrial products by CARIFTA/CARICOM were worth around 56 million dollars, i.e., around half total intra-area exports.

In view of the time which has elapsed, it is also explicable why modifications of importance have not taken place in the structures of production concerned here; however, it may be said that the commercial operations promoted by free trade helped to maintain the expansion of the industrial sector in this area and provided an opportunity for using idle capacity. Up to 1973 the establishment of new integration industries was unknown.

It is to be anticipated that with the evolution of CARIFTA towards the forms of a common market (CARICOM), machinery in addition to that used for the promotion of trade will be put into operation and will be more explicitly and directly connected with achieving increasing and balanced development.

The bases have thus been laid for a new stage of integration, which would have firmer bases and further-reaching objectives, so that the promising but fairly moderate achievements of the stage which has just been completed can be improved upon.

The following reflections may be made on the basis of this rapid summing up of the achievements of the integration system in the field of industry:

(a) The influence of the integration systems on the respective national industrialization processes can only be described as limited, as far as the responsibilities laid upon this mode of development in terms of speeding up industrial development and easing the external bottleneck are concerned;

/(b) The

(b) The implications of the above depend on which system is involved: it is fully applicable to LAFTA and with important qualifications to CACM. As far as the Cartagena Agreement and CARIFTA/CARICOM are concerned, the limitation is basically related to the short period during which they have both been operating;

(c) In LAFTA and CACM their limited results are associated with the type and scope of the integration commitments adopted. Since action was centred on the trade machinery, it was not possible to go beyond a certain point, and the initial tempo tended to run down at a fairly stage, while the considerable transformations expected did not take place;

(d) This does not, however, mean that promising initial achievements have not been recorded. The CACM countries, for example, together achieved a first stage of import substitution, under conditions which it would have been difficult to reproduce if they had acted in isolation;

(e) The difficulties which tended to paralyze the process of integration, were to a large extent a reflection of the dissatisfaction caused by the unequal share of the different countries in them. The machinery used was unable to prevent the tendency for the benefits of the process - even when they were scanty - to be concentrated in the countries with the greatest industrial potential;

(f) Even in the case of these last mentioned, the predominant share of the transnational enterprises in a large part of the trade fostered by market expansion, raises a query as to how far the different countries profited from the benefits;

(g) The inadequacies mentioned and the poor results obtained do not invalidate the main premises on which integration is based. They do, however, make it necessary to introduce the necessary corrections and reorientations, in order to achieve the objectives pursued;

(h) It is considered that the introduction into the integration system of elements or machinery aimed at conducting the industrial integration process according to predetermined objectives, would make it possible to ensure the maintenance of some balance in the distribution of benefits and the speeding up of the development process.

## C. PRESENT EXISTENCE AND TREND OF THE PATTERNS OF INDUSTRIAL DEVELOPMENT

Industrialization in Latin America takes place by means of the combination of three complementary forms or patterns which may be defined as import substitution, the expansion of the domestic market and the export of manufactures. A fourth pattern of industrial development may be added to these: participation in and use of the regional economic integration systems, which combines the import substitution pattern with wider geographical limits and the export patterns, considered as an operational means for the enterprises to pass beyond the relatively narrow setting of the domestic markets.

The combination of each of these patterns in different proportions defines the peculiarity of industrial development in each country at any specific moment. The model is slowly modified as the share of each pattern in the whole changes its importance with time and stamps its own features on the process of production.

It should be borne in mind that the existence of the above-mentioned patterns is reviewed within the setting of the present system of international economic relations, which today are under discussion and which could be modified in the near future, and together with them the impact of the patterns in question on the industrial development of the region. At the present time there exists a general consensus that the problem of development of which industrialization is part, does not exclusively involve the countries burdened with a backward situation. On the contrary, the idea that under-development is a concern which should involve even the developed nations and that all should take part in the endeavour to root out poverty and backwardness is making headway.

If this is the case modifications should perhaps also be made to a structure of relations which, for reasons stemming from the importance of the factors historically involved, or because of the different bargaining capacity of the central and peripheral countries, was so constituted that at present it may be contributing to maintaining indefinitely the circumstances which it is desired to eliminate.

/1. Import

## 1. Import substitution

Import substitution constituted the pattern of development by means of which all the Latin American countries tackled the first stages of the industrialization process. These first stages meant the massive conquest of the existing market and the replacement of the sources of external supply by new national output; they resulted in high growth rates in this sector in all the countries, and at the same time in the rapid diversification of industrial output and large increases in urban employment in industry. Because of its direct effects and its repercussions on other sectors, import substitution became the most active mechanism for modernizing the economies.

However, in view of the economic potential of each country and the intensiveness and extent of the policies adopted, the evolution of the import substitution process and its effect on the rest of the economy was very different in the different countries of the region. For example, the coefficient of imported supply in the domestic supply of industrial commodities which had decreased rapidly in all the countries during the first stage, subsequently followed a different path in each country. In the course of time, its value decreased the greater was the aggregate volume of domestic demand in the countries. Generally speaking, Argentina, Brazil and Mexico recorded the lowest coefficients, Colombia, Chile, Peru and Venezuela rather higher coefficients, and the small countries appreciably larger coefficients.

If the traditional industrial activities of the large countries are taken into consideration, it may be seen that the coefficient of imported supply varied relatively little after 1950, as a result of the major progress which already at that time had been achieved in import substitution in respect of these goods. In these same countries, however, as from that date a large and systematic decrease, which latterly tended to slow down, took place in the coefficient of external supply of intermediate goods, consumer durables and capital goods.

/Import substitution

Import substitution acquired another feature in countries with different sizes of markets. If the medium-sized countries are considered as a whole, the imported supply of goods for immediate consumption began with relatively high coefficients in 1950 and reached levels similar to those of the large countries; however, imports of intermediate goods, consumer durables and capital goods were replaced at a slow rate and still have higher coefficients of external supply. If these countries are considered separately, there exist appreciable differences between them, stemming from the fact that in some countries industrialization has a relatively long tradition, while in others, it only began to be intensified following the Second World War.

In the smaller countries, the imported supply of goods from the metal manufactures and machinery industries does not show any appreciable decline, and thus indicates the low levels of development in the sector during this period. But even in these countries there are important differences in the values of the coefficient of imported supply, mainly connected with the period in which the industrialization process began. In Uruguay, the coefficients of imported supply are relatively low, because industrialization began at the end of last century and became intensive as from the third decade of the present century, while in other countries like Ecuador and Paraguay the history of the process is shorter.

In more recent years a general tendency for the coefficient of external supply to become more stable may be seen in the majority of the countries of the region, and sometimes an important increase may be observed, particularly in the metal manufactures and chemicals sectors. This increase is due to various causes, but it does not indicate the regression of the process nor any reduction in its tempo. On the one hand there have been changes in the structure of the demand for manufactures in favour of goods with a larger import content, and this is associated with the increase in per capita income. Thus, although the import coefficient in each activity remains fixed, the average coefficient increases because of the change in the structure

/of imports.

of imports. Secondly, the increase in exports of manufactures which has taken place in recent years has brought with it a corresponding increase in imports, on account of the import content of these products, particularly in the case of metal manufactures and machinery.

Furthermore, some countries have increased their investment in recent years to a large extent, and have acquired imported machinery and equipment, by resorting to external indebtedness and in particular to suppliers' credits.

When import substitution met with its first obstacles in the industrialized countries of Latin America because the possibility of tackling the large-scale production of new lines of non-durable consumer goods had been exhausted, criticisms of the import substitution industrialization model appeared, and were repeated in other countries as they also came face to face with a similar loss of tempo. These criticisms are still frequently heard in countries where the industrialization process began later, and which could still have ample possibilities for engaging in import substitution.

It is apparently forgotten that although the pattern of import substitution cannot keep up the fast tempo of those stages in which the existing domestic market is being used on a large scale to any lasting degrees, it is a process on which industrial development feeds continuously, and still is in full force although its possibilities vary according to the individual conditions of each country. Furthermore, its latter evolution in the 1960s would appear to give the lie to prophecies as regards industrialization prospects, based on the increasing inelasticity and the lower value of the coefficient of imported supply in the total supply of manufactures in those countries where import substitution had advanced most.

This may be partly explained because the process is forward-looking, since the effects which it causes act in one form or another on the volume of imports. The replacement of imports of a specific type of good promotes a demand based on imported inputs and capital goods so that the economy can engage in new production. In its turn, the growth of the deman for these new imported goods opens up the possibility of replacing them at a later stage.

/Furthermore, the

Furthermore, the appearance of new domestic output tends to increase the demand for the goods so produced, because of the effect of the new earnings generated by industrial activity, and because the restrictions which generally limited the consumption of these goods when they were imported disappear. Both circumstances constitute a factor which increases imports and changes their structure. On the other hand, the import coefficient reflects both the imported inputs required to produce that specific good, and also the direct and indirect requirements of the other activities connected with the new industries which are being incorporated.

Industrial growth generated in this form bring renewed pressure to bear on import capacity and gives impetus to the creation of new industries, which in turn require new imports which increase still further with the growth in the domestic demand for the new replacement goods. Consequently, the fact that the import coefficient has not continued to decrease in the region as a whole and in the majority of the countries taken individually, is not sufficient to lead to conclusions as to the true direction which the substitution process has been taking.

In addition to the above, while a country remains in a situation of technological dependence, as is the case of nearly all the sectors of activity in the countries of Latin America, the inclusion of new goods in the system of production will have to take place through the machinery of import substitution, generally speaking, because these goods will have figured initially as having been imported from countries which initiated their production. Technical innovation takes place so rapidly that it is the cause of the continuous incorporation of new processes, products or designs. This fact gives permanence to import substitution in respect of industrial goods of all types, whether they are for immediate consumption or are consumer durables, intermediate or capital goods, although it is much less intensive than was the case in the stages of generalized import substitution.

/In the

In the larger countries the pattern remains in existence and is thus recognizable. In some countries the continuity of the import substitution process is promoted through the periodic study of the items of industrial imports which have been maintained in the last five years.

On the other hand, interest exists in promoting import substitution in respect of capital goods. The analyses made have shown that the coefficientes of imported supply maintain a value of 60 per cent and over in certain items of capital goods. Both in Argentina and in Brazil and Mexico, import substitution in respect of these goods constitutes a concern of those responsible for drawing up industrial policy.

Imports substitution in respect of capital goods involves in some cases overcoming problems of the size of the market, since even the largest countries of the region have relatively small volumes for the generalized production of these types of goods. On the other hand, the problems stemming from technological dependence must be surmounted, since otherwise national output might continue to follow the path of the innovations made in the developed countries.

All the above points to the need of giving continual attention to a pattern which leads to the installation of new activities in the industrial sector on a permanent basis. It is of major importance to do so, so that the new enterprises will be located in accordance with national objectives, so that their technologies make use of the country's natural and human resources and so that they will operate efficiently. This implies formulating policies which will both stimulate this process and control it in order to avoid the repetition of the problems which arose during the stages when the objective was almost exclusively the promotion of the overall growth of the industrial product and the dissemination of new activities.

In brief, the high degree of aggregation in the figures used to calculate the coefficients of external supply obscures the fact that import substitution in respect of local goods is taking place

/simultaneously in

simultaneously in some industrial activities, while in others the quota of imported supply is being maintained, and in others still imports are being increased by the inclusion of new goods or the lag in domestic supply.

For the countries which began industrialization at a later date, import substitution at the national level (or the regional level in integration systems), and without the errors of previous experience, continues to provide a means of industrialization which should make it possible for them to build up rapidly the necessary industrial infrastructure and obtain the experience required to tackle successfully other stages of or roads to industrial development.

## 2. The expansion of the domestic market

The expansion of the domestic market as a pattern of development is closely linked with that of import substitution in that the increases in demand which the former would imply would tend to increase the import coefficient, while the effect of this phenomenon would be lessened by producing the new products locally. However, these patterns differ from each other in that the first takes as its objective the later expansion of the manufacturing activities already in existence, and in this sense the policies to promote industrial development also differ from those applied in an import substitution process.

It should be mentioned that policy measures to stimulate import substitution have been projected and that concern exists to rectify some of the problems raised by its previous modus operandi. It is, however, common for the use of the domestic market to be left to the spontaneous evolution of the economy, which means that its potential dimensions are not made use of.

The size of the domestic market is associated with the absolute size of the population, income levels and income distribution (among the strata of the population and geographically speaking).

From the size of their markets, the largest Latin American countries have a larger demand potential than the intermediate and small

/countries. As

countries. As income grows, this potential materializes more rapidly in these countries than in the smaller countries. As more complex production is gradually tackled, the new inter-industrial and inter-sectoral relations established give rise to greater complementarity of activities; for the great majority of these and for the sector as a whole, this provides an impetus more important than that coming from the external trade drive. In the economies of the intermediate-sized markets of Latin America, this complementarity takes a more restricted form, because it continues to depend on imports of various inputs in order to produce final outputs. Consequently, a smaller number of activities linked by input-product ratios benefits from the expansion of the domestic market than in the case of the larger countries, and possibilities which the latter take advantage of are lost; thus the growth capacity of the industrial sector stemming from the expansion of the domestic market is reduced. This argument is still more valid for the smaller countries.

The differences in potential which stem from the differences in the size of the domestic markets are very important, because the activities which are prohibited for the countries with medium or small-sized markets include some of those which give most impetus to industrial development. For example, the degree of integration which the countries with large domestic markets achieve in the motor-vehicle industry is much greater than that achieved by the medium-sized and small countries. In these last-mentioned, there is not even the minimum demand which justifies the domestic production of parts and spares which is possible in the first-mentioned. Thus the smaller countries find themselves deprived of the multiplier effects which the metal manufactures and machinery industry has on general industrial development in the stage under consideration.

From the above it may be deduced that the use of the domestic market constitutes an industrial development pattern the importance of which increases more than proportionally the larger the size of the market. But this does not mean that its importance for the smallest

/countries should

countries should be neglected. It has already been shown that in any case the influence shed by the use of the domestic market on the development of the sector is more important than that of any other pattern of development, measured in terms of the growth of the industrial product. What it is desired to emphasize once again is that the extent of industrialization which may be reached by the countries with the smallest markets would be less.

From the point of view of the objectives of the International Development Strategy, not to use the domestic market means maintaining conditions which make it impossible for part of the population of each country to achieve the standards and quality of living to which the rest have access at other opportunity levels. International co-operation should thus stimulate the adoption of policies which tend towards this objective, particularly in the countries with the smallest markets, and should also collaborate in applying them.

### 3. Exports of manufactures

In all the countries of the region there exist problems of the economy as a whole and the industrial sector in particular which cannot be resolved while industry remains enclosed within the limits of the domestic market. This began to indicate the need to adopt and draw up policies to stimulate exports of manufactures, in order to give shape to a new pattern for the development of the sector, which would be able to solve some of the above-mentioned problems and implant a new tempo in industrial activities. At the beginning, this decision took the form of the regional integration system and at a later stage the larger Latin American countries drew up measures aimed at promoting the export of manufactures to the rest of the world. Among these mention may be made of the fiscal and credit incentives and advantageous exchange rates, as well as services to the exporter, such as the standardization and control of quality, the supply data on world markets, and international fairs and others. Generally speaking, these measures have been adopted by all the medium-sized and small countries.

/In recent

In recent years, the export of manufactures would indeed appear to open up a promising road for the expansion of the industrial sector, mainly in the larger countries. This process has benefited from various internal and external factors. The size of the domestic markets made it possible for the metal manufactures and machinery engineering and electrical industries to expand, and in particular transport materials, in the development of which the local manufacture of spare parts had an increasing share. In particular, in connexion with these last-mentioned, the transnational enterprises contributed as their share technology and industrial experience and helped with the rapid evolution of the domestic demand for spare parts, which gave impetus to national production based on the policies for the national integration of industry. These enterprises also at a later date contributed their trade experience and their connexion for access with their products to the external market. On the other hand, the incentive policies made it possible to situate many types of goods, including traditional goods, on a level of larger scales of production, standards of quality, prices, and supply opportunities; this constituted a group of favourable conditions for achieving diversified markets.

All in all, it would appear that the increase in exports of manufactures recorded in recent years in the region does not only stem from the internal effort made by the countries.

The factors of the economic situation itself have also had an important influence; they have determined situations of instability and insecurity in the markets of the developed countries, and have benefited developing countries with exportable balances of industrial products.

Although the policies to promote exports of industrial products have spread to nearly all the Latin American countries, the results have to date been less encouraging for the medium-sized and small countries. Once again, the different potential of the various countries would appear to have influenced this mode of development, and this demonstrates the need to create different strategies and

/policies according

policies according to the particular group of factors present in each country and according to each individual circumstance.

In the case of the small countries in particular it does not seem to be feasible to aspire to a share in the generalized exports of industrial products to the rest of the world in the short or medium-term. It would appear more logical for them to devote themselves to producing the special types of industrial goods in which each country has an advantageous position, either owing to the existence of very high productivity natural resources in which unskilled labour takes an intensive share, or where it is possible to establish some original feature of design or use some special technology of their own.

Lastly, it would appear that the pattern of development through exports of manufactures should take the form of much deeper-based measures aimed at the rationalization of production, the amalgamation and transformation of enterprises and their planning, and a group of measures to stimulate marketing, including the analysis of exportable supplies and markets, the financing of exports and the adjustment of the institutional machinery to the requirements of the world market.

## 4. Integration as a development model

Generally speaking, it may be said that the influence of the integration systems existing in Latin America on the national industrialization processes has been rather restricted. Naturally, this observation is only applicable to such systems as have been in existence sufficiently long to make evaluative conclusions possible.

It must be confessed that the change in the modus operandi of import substitution, progressing from action at the exclusively local level to activities associated with other countries, brings with it difficulties and complexities of no small importance. Obviously, this change will only be feasible if the national appraisals show that the profits are greater than the costs and that consequently there is a firm desire to take this path.

/The numerous

The numerous difficulties which have been typical of this process may give rise to questions regarding the validity or soundness of the integration model. It is considered, however, that what is questionable is the application which has been made of the model, but not its validity as a pattern of industrial development.

The major theses which led the countries to come together by expanding their economic space, so as to continue with import substitution on broader bases and, generally speaking, give their industrial development a new dimension, continue to be valid, both in terms of factors like the economies of scale, benefits of specialization, etc., and also others more closely linked to the modes and trends of the world market.

It may thus be said that integration may come to have a favourable influence on the endeavours to intensify exports to the world market, both on account of the lower costs as a result of the use of the economies of scale, and because of the experience acquired from acquaintance with external markets and, generally speaking, from the business of exporting.

It should also be said that the first indications of a new ordering of international economic relations are emerging. It is possible that better possibilities of access to the developed countries by manufactures from the developing regions may arise out of this new order. Furthermore, there is also the possibility that specific industries may in the future be able to shift from the central countries to the developing regions within the framework of the new international economic structure.

Even it does not seem to be immediately possible for them to materialize, all these prospects make it even more necessary to pool efforts in order to achieve adequate capacities and operating conditions for participation in the new order. This increases the urgent need of putting new life into the integration movements.

These situations will perhaps become even more marked, in view of the increasing share of groups or blocks of countries in international economic relations, and the active presence in these of the large transnational enterprises.

/It is

It is reasonable to suppose that whatever the case, integration will create a bargaining capacity of considerable magnitude which will make it possible for the countries to take part with better possibilities of adequately safeguarding their interests. However, in view of the size of the requirements involved, even the capacities achieved by the present integration systems may be inadequate, especially in some cases.

It is thus important to underline the advisability of laying the bases for the convergence of existing movements in a central system - the Latin American common market - which could group both the countries which form part of integration agreements at the present time and the rest.

# Chapter V

# NATURAL RESOURCES

## A. ENERGY AND ITS PRESENT STATUS

### 1. Introduction

For some time past, radical changes, both technical and institutional, have been taking place in the energy sector, all directed towards a more economic and rational utilization of its productive sources. Such tendencies are examplified in the marked preference shown for large interconnected developments instead of separate small- or medium-sized thermoelectric power stations; the standarization of generation frequencies in order to permit the formation of interconnected national systems; the elimination of small public utility companies and their replacement by enterprises of nation-wide scope; control of their sources of energy by the countries themselves, etc. In the 1970s so far these trends have been maintained in several respects, and intensified by the impact of the rise in international petroleum prices on the national economies.

Some of the outstanding events of the early years of the present decade are described in brief outline below.

In the field of electricity, most of the countries have speeded up surveys of their water resources to improve their overall cadasters and, in some cases, to prepare specific high-capacity hydroelectric projects. At the same time, whenever possible, study is being devoted to the substitution of coal or natural gas for petroleum products in power stations already in operation. The execution of the programmes for the installation of new power stations, which cover the period up to 1980, will ensure, in combination with earlier measures, that generating capacity based on petroleum products will remain approximately stationary in absolute terms. The increase in the price of crudes has reaffirmed the expediency of the policy pursued by many Latin

/American countries

American countries with a view to further replacement of petroleum consumption through more efficient utilization of water resources and other sources of energy.

During the 1970s, relatively large-scale utilization of two new sources of energy has been initiated in Latin America, with the construction of the 75 MW geothermic power station at Cerro Prieto (Mexico, 1972) and the Atucha nuclear power station of 340 MW (Argentina, 1974).

It should be stressed that prior to the rise in petroleum prices only nuclear units of 600 MW or over were economic; today this minimum has dropped to 150 or 200 MW, which means that they can form part of smaller systems.1/

In relation to the control of countries over the development of their own natural resources, the tendency for the State to absorb energy supply services has become more marked. Three more electricity enterprises have been nationalized, and thus another three countries have gained almost entire control over production of electric energy for public utility purposes. In 1970 Chile nationalized the Compañía Chilena de Electricidad, Panama did likewise by the Compañía Panameña de Luz y Fuerza in 1972, and Peru, at the end of 1974, nationalized the Empresas Eléctricas Asociadas (Lima Light) and Hidrandina. Thus, of public-utility installed capacity, which in 1973 amounted to some 42.5 million kW, only about 3.6 million are under private control (a little over 8 per cent).

In the field of hydrocarbons, regional production of crude oil was less in 1970-1974 than in 1965-1970, chiefly owing to Venezuela's policy of conservation of its reserves. Yet proven reserves of crude increased in this period in consequence of the extension and re-exploration of old oilfields and the discoveries of new deposits in some of the Latin American countries.

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1/ For service security reasons the capacity of each unit should not exceed 10 to 15 per cent of the capacity of the electricity system of which it forms a part.

/In recent

In recent years the region has shown a certain willingness to accept the participation of capital and technology of specialized international enterprises in the exploration and development of new deposits, but on different bases. The old "concession" system, under which the host country obtained benefits chiefly through taxation on the enterprises' profits, has been ousted by the system of "service contracts", under which the petroleum company runs all the economic risks involved in exploration and the host country receives part of the output of petroleum obtained.

The heavy increases in world oil prices have had profound repercussions on the Latin American petroleum market. The net exporter countries (Venezuela, Ecuador, Bolivia, Trinidad and Tobago) have considerably increased their income, while the importers have seen their trade balances and balance-of-payments positions adversely affected.

As one way of palliating the prejudicial effects of the rise in petroleum prices on the Central American economies, in December 1974 the governments of these countries and Venezuela concerted economic co-operation agreements aimed, inter alia, at financing imports of Venezuelan petroleum and strengthening the balance-of-payments positions of the Central American countries.

## 2. Natural resources used in the satisfaction of energy consumption in Latin America

Total consumption of energy in Latin America during 1973 amounted to 252 million tons of petroleum equivalent (t.p.e.), and was distributed, by sources of production utilized, as follows: petroleum, 125.4 million (49.7 per cent); natural gas, 33.4 million (13.2 per cent); hydroelectricity, 33.1 million (13.1 per cent); coal, 9.7 million (3.8 per cent) and vegetable fuels, 50.7 million (20.1 per cent) (see table 1). If the last names are excluded, that is if only commercial energy is taken into account, consumption amounted to 202 million tons of petroleum equivalent, and the share of the various sources is as follows: petroleum, 62.2 per cent; natural gas, 16.6 per cent; hydroelectricity, 16.4 per cent; and coal, 4.8 per cent.

/Table 1

Table 1

LATIN AMERICA: PRODUCTION AND CONSUMPTION OF FUELS AND HIDROELECTRICITY, 1973

(Thousands of tons of petroleum equivalent at 10 700 kcal/kg)

| Country | Production | | | | | | Consumption | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coal | Petroleum | Natural gas | Hidroelectricity | Vegetable fuels | Total | Coal | Petroleum | Natural gas | Hydroelectricity | Vegetable fuels | Total |
| Argentina | 261 | 21 997 | 7 755 | 873 | 1 713 | 32 599 | 807 | 21 507 | 5 754 | 873 | 1 713 | 30 654 |
| Barbados | - | | | - | 99 | 99 | - | 200 | - | - | 99 | 299 |
| Bolivia | - | 2 251 | 3 724 | 230 | 1 023 | 7 234 | - | 615 | 32 | 230 | 1 023 | 1 906 |
| Brazil | 1 380 | 8 493 | 1 027 | 17 537 | 17 366 | 45 803 | 2 620 | 32 037 | 200 | 17 537 | 17 366 | 69 760 |
| Colombia | 2 090 | 9 280 | 2 958 | 2 734 | 3 947 | 21 009 | 2 090 | 6 089 | 1 610 | 2 734 | 3 947 | 16 470 |
| Costa Rica | | - | - | 339 | 392 | 731 | - | 490 | - | 339 | 392 | 1 221 |
| Cuba | | - | - | 30 | 4 067 | 4 097 | - | 6 850 | - | 30 | 4 067 | 10 947 |
| Chile | 900 | 1 490 | 6 417 | 1 604 | 1 196 | 11 607 | 1 090 | 5 582 | 1 040 | 1 604 | 1 196 | 10 512 |
| Ecuador | | 10 025 | 78 | 141 | 1 667 | 11 911 | - | 1 461 | 55 | 141 | 1 667 | 3 324 |
| El Salvador | | - | - | 131 | 877 | 1 008 | - | 545 | - | 131 | 817 | 1 553 |
| Guatemala | | - | - | 94 | 1 155 | 1 249 | - | 901 | - | 94 | 1 155 | 2 150 |
| Guyana | | - | - | - | 323 | 323 | - | 550 | - | - | 323 | 873 |
| Haiti | | - | - | 33 | 1 286 | 1 319 | - | 133 | - | 33 | 1 286 | 1 452 |
| Honduras | | - | - | 107 | 630 | 737 | - | 420 | - | 107 | 630 | 1 157 |
| Jamaica | | - | - | 42 | 449 | 491 | - | 1 998 | - | 42 | 449 | 2 489 |
| Mexico | 2 100 | 27 398 | 16 677 | 5 138 | 8 569 | 59 682 | 2 560 | 27 295 | 13 008 | 5 138 | 8 309 | 56 370 |
| Nicaragua | | - | - | 54 | 481 | 535 | - | 545 | - | 54 | 481 | 1 080 |
| Panama | | - | - | 20 | 246 | 266 | - | 920 | - | 20 | 246 | 1 186 |
| Paraguay | | - | - | 113 | 535 | 648 | - | 210 | - | 90 | 535 | 835 |
| Peru | 109 | 3 341 | 1 696 | 1 520 | 2 234 | 8 900 | 210 | 4 954 | 379 | 1 520 | 2 234 | 9 297 |
| Dominican Republic | | - | - | 55 | 1 309 | 1 364 | - | 760 | - | 55 | 1 309 | 2 124 |
| Trinidad and Tobago | | 8 681 | 2 575 | - | 268 | 11 524 | - | 1 600 | 1 500 | - | 268 | 3 368 |
| Uruguay | | - | - | 465 | 120 | 585 | 26 | 1 600 | - | 465 | 120 | 2 211 |
| Venezuela | 30 | 175 798 | 42 978 | 1 842 | 936 | 221 584 | 275 | 8 185 | 9 834 | 1 842 | 936 | 21 072 |
| Total for Latin America | 6 870 | 268 754 | 85 885 | 33 108 | 50 688 | 445 305 | 9 678 | 125 447 | 33 412 | 33 085 | 50 688 | 252 310 |

Source: ECLA, on the basis of official data.



/Consumption of

Consumption of commercial energy increased during the period 1970-1973 by 7.3 per cent. If the region is taken as a whole, in 1973 production of commercial fuels (hydrocarbons and coal) and hydroelectricity amounted to 395 million tons of petroleum equivalent, i.e., easily outstripped consumption. If, however, the five countries which are net exporters of petroleum (Venezuela, Ecuador, Bolivia, Trinidad and Tobago and Colombia) are excluded from the total, the scene changes completely: consumption (164 million tons of petroleum equivalent) works out at a higher figure than production (129 million tons of petroleum equivalent).

The 19 oil-deficit countries in the aggregate imported 21 per cent of their commercial energy requirements, and, what is far more important, about 42 per cent of the petroleum they consumed in 1973.

Per capita regional consumption of commercial energy in 1972, which amounted to 647 kilogrammes of petroleum equivalent, represented about 48 per cent of the corresponding world average (as against 46 per cent in 1970) (see table 2). Latin America's low position on the world list is in marked contrast with its enormous wealth of energy-producing resources. The disparity is largely explained when account is taken of the regional differences in respect of the level, structure and techniques of production, in addition to the fact that comparatively little has been done to develop hydroelectricity and petroleum resources in many Latin American countries.

Despite the upswing in the world market price of fuels in 1973, energy supplies do not seem to have constituted a major hindrance to Latin America's economic growth in that year. Nevertheless, as will be seen later, the same may not be true of many countries of the region in 1974, in which year world market prices of crudes shot upward.

/Table 2

Table 2

LATIN AMERICA: TOTAL AND PER CAPITA CONSUMPTION OF COMMERCIAL ENERGY, AND ITS RELATION TO THAT OF OTHER REGIONS OF THE WORLD

(Millions of tons of petroleum equivalent, millions of inhabitants, and kilograms of petroleum equivalent per capita)

| | Total and per capita consumption of commercial energy | | | | | | | | | | | | Growth rates of total and per capita consumption | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1965 | | | | 1970 | | | | 1972 | | | | 1965-1970 | | 1970-1972 | |
| | Total | Percentage | Population | Per capita | Total | Percentage | Population | Per capita | Total | Percentage | Population | Per capita | Total | Per capita | Total | Per capita |
| Latin America | 115 | 3.2 | 241.9 | 475 | 164 | 3.5 | 279.0 | 588 | 183 | 3.6 | 295.4 | 647 | 7.4 | 4.4 | 5.6 | 4.9 |
| Western Europe | 740 | 20.8 | 342.8 | 2 159 | 950 | 20.5 | 354.0 | 2 684 | 1 017 | 20.0 | 358.9 | 2 833 | 5.1 | 4.4 | 3.4 | 2.8 |
| Eastern Europe | 793 | 22.3 | 332.8 | 2 363 | 1 005 | 21.6 | 347.9 | 2 888 | 1 104 | 21.8 | 345.1 | 3 117 | 4.9 | 3.9 | 4.9 | 3.9 |
| United States | 1 196 | 33.6 | 194.2 | 6 158 | 1 512 | 32.6 | 204.9 | 7 319 | 1 632 | 32.2 | 208.8 | 7 816 | 4.8 | 3.7 | 3.9 | 2.9 |
| Other developed countries | 322 | 9.1 | 151.9 | 2 120 | 489 | 10.5 | 164.4 | 2 974 | 535 | 10.6 | 169.4 | 3 158 | 8.7 | 7.0 | 4.6 | 3.1 |
| Rest of the world | 393 | 11.0 | 2 011.5 | 195 | 524 | 11.3 | 2 254.4 | 232 | 601 | 11.8 | 2 348.1 | 256 | 5.9 | 3.5 | 7.1 | 5.0 |
| World total | 3 559 | 100.0 | 3 275.1 | 1 087 | 4 644 | 100.0 | 3 604.6 | 1 288 | 5 072 | 100.0 | 3 734.7 | 1 358 | 5.5 | 3.5 | 4.5 | 2.6 |

Source: United Nations, World Energy Supplies, Series J, Nos. 15 and 17; and official data.

/Of the

Of the regions indicated in table 2, Latin America is the one that makes most use of hydrocarbons in percentage terms. The degree of self-sufficiency in respect of petroleum varies enormously among the 19 oil-deficit countries of the region: it is nil in 14 of them which depend entirely upon imports to satisfy their domestic needs (in two of these - Barbados and Guyana - imported petroleum was the sole form of commercial energy consumed in 1973), and almost complete in Argentina and Mexico. Intermediate positions are occupied by Chile and Brazil, which import three-quarters of the petroleum they consume, and Peru, which imports one-third.

Hence it is clear that there is a marked lack of balance in Latin America between the structure of commercial energy consumption and the capacity of the various local sources of energy to satisfy it: a circumstance which obstructs the formulation of policies designed to increase self-sufficiency in this field.

In face of the liberal and wide-spread consumption of petroleum, only in five of the twentyfour countries under consideration are proven reserves sufficient to meet requirements, while in another five they can do so in part. In the remaining fourteen, all the petroleum needed has to be imported. In 1973 the deficit countries were obliged to import over fifty million tons.

Generally speaking, the water resources which exist in abundance in almost all the countries of the region are still turned to little account. Before petroleum prices soared in 1973, it was estimated that the electric energy which could be generated on a sound economic basis in Latin America was in the neighbourhood of 2.8 million GWh, about 25 times the total amount of hydroelectricity actually generated in 1973. Owing to the increase in the cost of thermoelectric generation many hydroelectric projects which formerly were not economic are so today, which means that the figure previously indicated - 2.8 million GWh - is likely to rise considerably. The possibilities for hydroelectricity are therefore even greater than before.

Other sources of energy are also drawn upon, but their use is more local. The following are the chief of these:

/(i) Natural

(i) Natural gas. Proven reserves are vast (1,930 thousand million cubic metres in 1970) and are found mainly in Venezuela (45 per cent), Mexico (12 per cent) and Argentina (9 per cent). Other countries possessing deposits are Bolivia, Brazil, Colombia, Chile, Peru and Trinidad and Tobago.

Production of natural gas, concentrated chiefly in five countries (Venezuela, Mexico, Chile, Argentina and Bolivia), is generally linked to production of petroleum, with the result that it cannot be adapted to consumer requirements. This is why consumption still absorbs only one-third of output, and, unfortunately, a substantial proportion is flared off and wasted.

(ii) Coal. The largest known coalfields are situated in Argentina, Brazil, Colombia, Chile, Mexico, Peru and Venezuela. Their potentialities are great, since estimates place measured reserves at 4,100 million tons and potential reserves at 60,000 million. Current output does not exceed 12 million tons per annum and is concentrated almost entirely in the first five of the countries mentioned.

(iii) Geothermic energy. This resource seems to exist along the whole of the western fringe of the Latin American subcontinent. Knowledge of its potentialities is very unreliable, since up to now only three countries have shown active interest in this source of energy. They are Mexico, which as early as 1972 brought into service a 75 MW power station of this type, and intends to expand it up to 360 MW; El Salvador, which is currently constructing a 33 MW power station in Ahuachapán; and Chile, which is studying geothermic possibilities at El Tatio, in the province of Antofagasta.

(iv) Radioactive minerals. Prospecting for this resource is still in its initial stages, Argentina, Brazil and Mexico being the countries which have done most in this field. By 1973, estimated reserves of $U_3O_8$ stood at 53,000 tons in Argentina, 73,000 tons in Brazil and 1,900 tons in Mexico. For reference purposes, Argentina's nuclear power stations at Atucha (340 MW, recently constructed) and Río Tercero (600 MW, in process of construction) will consume, respectively, 50 and 80 tons of this fuel per annum.

/It should

It should be pointed out that the energy resources named above, with the exception of petroleum, are used principally in the form of electric energy. Hence their more intensive utilization will entail enlarging the electric energy market.2/

## 3. The electric energy industry

### (a) Generation and consumption

Generation of electric energy amounted to 196,850 GWh in Latin America in 1973, the average annual growth rate in 1970-1973 having been 9.7 per cent. As can be seen in table 3, there are vast differences between the various Latin American countries, from the standpoint of both levels and rates of generation of electricity.

The energy supply does not seem to have placed any serious obstacles in the way of the region's economic growth during the early 1970s. Nevertheless, there is still an immense unmet demand for electricity in many Latin American countries, particularly in rural areas. Despite this unsatisfied margin, the data appearing in table 4 suggest that the supply of electricity is expanding rapidly from the standpoint of the total number of consumers served in many Latin American countries.

The figures given in tables 4 and 5 highlight the rapidity with which generation of electric energy per capita and per unit of real product increased in Latin America during the past decade. Per capita generation of energy rose by 6.2 per cent in 1972-1973, and in 1973 amounted to 648 kWh, or 60 per cent more than in 1965 (i.e., the average annual growth rate was 6.0 per cent). Generation of energy per unit of gross product (in dollars at 1960 prices) increased by 8.1 per cent in 1970-1973, and reached 1.20 kWh by 1973. This figure exceeded its 1965 counterpart by 23.7 per cent (in other words, the average annual growth rate was 2.7 per cent).

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2/ It should be recalled that in 1973 only one-fourth of energy consumption was not by electric energy.

/Table 3

Table 3

LATIN AMERICA: TOTAL GENERATION OF ELECTRIC ENERGY

(GWh)

| Country | 1965 | | | 1970 | | | 1972 | | | 1973 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hidro-electric | Thermo-electric | Total | Hidro-electric | Thermo-electric | Total | Hidro-electric | Thermo-electric | Total | Hidro-electric | Thermo-electric | Total |
| Argentina | 1 225 | 14 158 | 15 383 | 1 555 | 20 172 | 21 727 | 1 499 | 23 843 | 25 342 | 2 918 | 23 668 | 26 586 |
| Barbados | - | 75 | 75 | - | 146 | 146 | - | 188 | 188 | - | 200 | 200 |
| Bolivia | 432 | 134 | 566 | 641 | 146 | 787 | 777 | 97 | 874 | 788 | 118 | 906 |
| Brazil | 25 515 | 4 613 | 30 128 | 39 863 | 5 597 | 45 460 | 51 000 | 6 600 | 57 600 | 58 640 | 7 400 | 66 040 |
| Colombia | 3 900 | 1 924 | 5 824 | 6 072 | 3 138 | 9 210 | 7 315 | 4 060 | 11 375 | 8 206 | 4 296 | 12 502 |
| Costa Rica | 550 | 96 | 646 | 931 | 86 | 1 017 | 1 103 | 157 | 1 260 | 1 132 | 203 | 1 335 |
| Cuba | 57 | 3 367 | 3 424 | 75 | 4 475 | 4 550 | 100 | 4 902 | 5 002 | 100 | 4 990 | 5 090 |
| Chile | 3 954 | 2 177 | 6 131 | 4 307 | 3 243 | 7 550 | 5 226 | 3 108 | 8 934 | 5 319 | 3 447 | 8 766 |
| Ecuador | 248 | 323 | 571 | 405 | 544 | 949 | 445 | 672 | 1 117 | 470 | 821 | 1 291 |
| El Salvador | 362 | 48 | 410 | 460 | 193 | 653 | 427 | 406 | 833 | 439 | 440 | 879 |
| Guatemala | 106 | 343 | 449 | 328 | 433 | 761 | 284 | 652 | 936 | 315 | 677 | 992 |
| Guyana | - | 200 | 200 | - | 323 | 323 | - | 340 | 340 | - | 350 | 350 |
| Haiti | - | 96 | 96 | - | 118 | 118 | 70 | 63 | 133 | 110 | 30 | 140 |
| Honduras | 104 | 71 | 175 | 196 | 148 | 344 | 304 | 113 | 417 | 359 | 109 | 468 |
| Jamaica | 132 | 668 | 800 | 122 | 1 415 | 1 537 | 141 | 1 841 | 1 982 | 140 | 1 970 | 2 110 |
| Mexico | 8 837 | 8 415 | 17 252 | 14 990 | 14 448 | 29 438 | 15 428 | 19 967 | 35 395 | 17 182 | 21 536 | 38 718 |
| Nicaragua | 204 | 107 | 311 | 309 | 292 | 601 | 325 | 440 | 765 | 181 | 518 | 699 |
| Panama | 32 | 469 | 501 | 85 | 813 | 898 | 83 | 1 047 | 1 130 | 68 | 1 102 | 1 170 |
| Paraguay | - | 129 | 129 | 156 | 74 | 230 | 192 | 96 | 288 | 306 | 97 | 403 |
| Peru | 2 668 | 1 338 | 4 006 | 3 821 | 1 708 | 5 529 | 4 532 | 1 751 | 6 283 | 5 083 | 1 878 | 6 961 |
| Dominican Republic | 25 | 475 | 500 | 83 | 920 | 1 003 | 72 | 1 207 | 1 279 | 185 | 1 276 | 1 461 |
| Trinidad and Tobago | - | 912 | 912 | - | 1 203 | 1 203 | - | 1 308 | 1 308 | - | 1 210 | 1 210 |
| Uruguay | 610 | 1 039 | 1 649 | 1 242 | 890 | 2 132 | 995 | 1 312 | 2 307 | 1 556 | 901 | 2 457 |
| Venezuela | 1 369 | 6 834 | 8 203 | 4 058 | 8 850 | 12 908 | 6 020 | 9 009 | 15 029 | 6 159 | 9 957 | 16 116 |
| Latin America | 50 330 | 48 011 | 98 341 | 79 099 | 69 375 | 149 074 | 96 338 | 83 779 | 180 117 | 109 656 | 87 194 | 196 850 |
| Percentage | 51.2 | 48.8 | 100.0 | 53.5 | 46.5 | 100.0 | 53.5 | 46.5 | 100.0 | 55.7 | 44.3 | 100.0 |

Source: ECLA, on the basis of official data.



/Table 4

Table 4

LATIN AMERICA: GENERATION OF ELECTRICITY PER CAPITA AND ESTIMATES OF POPULATION SUPPLIED WITH ELECTRIC ENERGY[a]

| Country | 1970 | | 1973 | |
|---|---|---|---|---|
| | Per capita generation of electricity (KWH) | Population supplied (percentage) | Per capita generation of electricity (KWH) | Population supplied (percentage) |
| Argentina | 892 | 76.0 | 1 043 | 78.5 |
| Barbados | 575 | ... | 766 | ... |
| Bolivia | 169 | 16.2 | 181 | 19.5 |
| Brazil | 488 | 37.5 | 650 | 43.8 |
| Colombia | 416 | 45.1 | 508 | 52.0 |
| Costa Rica | 586 | 52.0 | 708 | 65.0 |
| Cuba | 545 | ... | ... | ... |
| Chile | 777 | 64.8 | 816 | 70.0 |
| Ecuador | 158 | 24.0 | 194 | 27.9 |
| El Salvador | 190 | 23.0 | 230 | 39.3 |
| Guatemala | 144 | 17.0 | 172 | 22.1 |
| Guyana | 433 | ... | 432 | ... |
| Haiti | 23 | ... | 25 | ... |
| Honduras | 133 | 11.0 | 163 | 17.0 |
| Jamaica | 770 | 18.8 | 995 | 22.9 |
| Mexico | 580 | 59.6 | 688 | 63.1 |
| Nicaragua | 297 | 35.0 | 315 | 48.4 |
| Panama | 616 | 47.0 | 756 | 62.8 |
| Paraguay | 407 | 13.2 | 150 | 23.1 |
| Peru | 407 | 20.6 | 467 | 22.1 |
| Dominican Republic | 231 | 24.4 | 303 | 27.5 |
| Trinidad and Tobago | 1 127 | 91.2 | 1 076 | 93.4 |
| Uruguay | 738 | 67.1 | 821 | 66.1 |
| Venezuela | 1 200 | 76.2 | 1 353 | 83.1 |
| Latin America | 531 | 45.8 | 648 | 50.2 |
| World | 1 362 | | 1 582 | |

Source: ECLA, on the basis of official data.

a/ As a percentage of the total population.

/Table 5

Table 5

LATIN AMERICA: RATIOS BETWEEN GENERATION OF ELECTRIC ENERGY AND GROSS DOMESTIC PRODUCT

| Year | Gross domestic product (millions of dollars at 1960 prices) | Generation of electricity (millions of KWH) | Ratio between generation of electricity and gross domestic product | Percentage growth rate | |
|---|---|---|---|---|---|
| | | | | Gross domestic product | Generation of electricity |
| 1960 | 78 186 | 67 624 | 0.86 | | |
| 1961 | 83 438 | 72 963 | 0.87 | 6.7 | 7.9 |
| 1962 | 86 841 | 78 189 | 0.90 | 4.1 | 7.2 |
| 1963 | 89 642 | 85 116 | 0.95 | 3.2 | 8.9 |
| 1964 | 96 363 | 92 900 | 0.96 | 7.5 | 9.1 |
| 1965 | 101 645 | 98 261 | 0.91 | 5.5 | 6.5 |
| 1966 | 106 336 | 106 986 | 1.01 | 4.6 | 8.1 |
| 1967 | 110 841 | 114 998 | 1.04 | 4.2 | 7.5 |
| 1968 | 117 992 | 125 588 | 1.06 | 6.5 | 9.2 |
| 1969 | 126 087 | 136 800 | 1.08 | 6.9 | 8.9 |
| 1970 | 134 642 | 149 074 | 1.11 | 6.8 | 3.0 |
| 1971 | 142 804 | 163 070 | 1.14 | 6.1 | 9.4 |
| 1972 | 152 760 | 180 117 | 1.18 | 6.9 | 10.5 |
| 1973 | 164 124 | 197 035 | 1.20 | 7.4 | 9.4 |
| 1974 | 175 300 | 218 100 | 1.24 | 6.8 | 10.7 |
| 1970/1960 | | | | 5.6 | 8.2 |
| 1970/1965 | | | | 5.8 | 8.7 |
| 1973/1970 | | | | 6.8 | 9.8 |
| 1972/1970 | | | | 6.5 | 9.9 |
| 1974/1972 | | | | 7.1 | 10.1 |
| 1974/1970 | | | | 6.8 | 10.0 |

Source: ECLA, on the basis of official data.

/Despite the

Despite the rapid growth revealed by both series of figures, generation at the present time still stands at a low level in relation to international averages. Per capita generation of electric energy in 1972 corresponded to 41 per cent of the world average and generation per unit of gross product in 1970 was equivalent to 78 per cent of the world figure, excluding the socialist countries.

Provisional data suggest that consumption of electric energy in Latin America (excluding losses) increased from 149,475 GWh in 1972 to 169,490 GWh in 1973, that is, by 13.9 per cent.

The sectoral composition of consumption of electric energy in Latin America remained relatively constant during the last decade. Industry and mining accounted for about half of the region's consumption; household and commercial consumption in the aggregate represented 25 per cent; and the balance corresponded to other consumption and to losses. The vigorous and sustained growth of industrial consumption of electricity in Latin America has not impeded a rapid increase in the supply of energy for household consumption, in view of the differences between these two major markets in respect of peak-load hours.

In Latin America, the relation between consumption of electric energy in power stations plus distribution losses, on the one hand, and total generation of electric energy on the other, after slightly declining during the 1960s, is estimated for 1973 at about 15 per cent. This is high in comparison with international averages, since in the industrialized countries the corresponding proportion is only about 8 per cent. In some cases the high indexes of losses in Latin America are explained by the fact that transmission distances are relatively long (because of the predominance of hydroelectric power stations), but as a general rule they are due more to deficiencies in distribution networks.

Only fragmentary data are available on the average efficiency of generation of thermoelectric energy in the Latin American countries. The figures for the public energy supply in eleven Latin American countries in 1972 indicate that the average input was 3,155 kcal/kWh

/(see table

(see table 6). In contrast, approximately 2,500 kcal/kWh are required in the countries members of the European Economic Community and in the United States. The Latin American figures, which cover about 80 per cent of the thermoelectric energy supply, reveal enormously wide scattering in relation to the estimated average for thermoelectric efficiency. In several Latin American countries, however, the efficiency of thermoelectric generation in the public sector improved in 1970-1972. The rise in world petroleum prices will now make investment to improve the efficiency of the electric energy generating industry in Latin America a sounder economic proposition.

The rise in the world market price of petroleum will in all likelihood influence the price of electric energy in the region.

In a recent ECLA study 3/ it was estimated that the increase in the cost of generating 1 kWh in steam power stations, which use petroleum as their fuel, might range from 49 to 93 per cent, according to the size of the generating units, the degree of thermoelectric efficiency and the plant factor. But the impact of these heavier production costs on electricity tariffs will be considerably less than might be expected, firstly because the cost of generation in Latin America represents only about half the final cost of supplying electricity to the consumer; and, secondly, because hydroelectricity provides more than half the region's output of electric energy (about 58 per cent in 1974).

In view of these considerations, and the modest share of the electricity input both in industrial costs and in household budgets, it seems unlikely that a contraction of electricity consumption will occur if the higher cost of petroleum products used in power stations is transferred to the consumers of electricity.

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3/ "The new oil prices and the Latin American electricity industry", ST/ECLA/Conf.50/L.3, 30 August 1974.

/Table 6

Table 6

LATIN AMERICA: PERFORMANCE OF THERMOELECTRIC POWER STATIONS[a]

| Country | 1970 | | | 1972 | | |
|---|---|---|---|---|---|---|
| | Generation of electricity (millions of KWH) | Calory consumption (millions of kcal) | kcal/ KWh | Generation of electricity (millions of KWH) | Calory consumption (millions of kcal) | kcal/ KWH |
| Argentina | 15 372 | 45 178 000 | 2 947 | 18 232 | 50 642 170 | 2 778 |
| Barbados | | | | | | |
| Bolivia | | | | 47 | 131 755 | 2 802 |
| Brazil | 5 248 | 20 408 000 | 3 888 | 2 724 | 10 493 404 | 3 858 |
| Colombia | 1 916 | 7 670 000 | 4 003 | 1 593 | 7 035 708 | 4 417 |
| Cuba | | | | | | |
| Chile | 3 244 | 9 830 000 | 3 030 | 3 702 | 11 428 963 | 3 082 |
| Ecuador | | | | | | |
| Guyana | | | | 176 | 713 235 | 4 052 |
| Haiti | | | | | | |
| Jamaica | | | | | | |
| Mexico | 11 225 | 36 261 000 | 3 230 | 16 286 | 51 214 000 | 3 145 |
| Paraguay | | | | 8 | 34 581 | 4 215 |
| Peru | | | | | | |
| Dominican Republic | 831 | 2 590 000 | 3 117 | 1 123 | 3 296 905 | 2 936 |
| Trinidad and Tobago | | | | | | |
| Uruguay | 890 | 2 852 000 | 3 204 | 1 312 | 3 984 160 | 3 031 |
| Venezuela | 4 351 | 14 845 000 | 3 411 | 5 066 | 19 730 267 | 3 894 |
| Central American countries | 1 965 | 6 077 600 | 3 093 | 2 563 | 8 017 992 | 3 159 |
| Total | 45 042 | 145 711 600 | 3 235 | 52 832 | 166 723 140 | 3 155 |

Source: ECLA, on the basis of official data.

a/ The figures do not as a rule represent totals or each country.

/From another

From another standpoint, the rise in petroleum prices constitutes a powerful incentive to finding substitutes for the technology based on oil. In this connexion, the ECLA study mentioned above draws attention to the better competitive opportunities now existing for nuclear power stations, as well as to the more advantageous prospects opening up for the utilization of the immense hydroelectric potential existing in the region.

(b) Installed generating capacity

At the close of 1974 Latin America's installed capacity for the generation of energy was estimated at 57.6 million kW. The figures presented in table 7 reveal the rapid growth of energy generating capacity in the region, as well as the increase in the capacity for the generation of hydroelectric energy at rates exceeding the average: the participation of hydroelectric energy in total installed generating capacity climbed from 41 per cent in 1965 to 47 per cent in 1972, and to an estimated level of 50 per cent in 1974.

This increasing utilization of hydroelectricity has now enabled many Latin American countries to palliate in great measure the effects of the higher prices of imported petroleum.

In 1973 Latin America's first nuclear power station using uranium and heavy water entered operation at Atucha, Argentina, with a capacity of 319 MW. The output of this power station is distributed by means of Argentina's main network linking up greater Buenos Aires and the Littoral. Nuclear power stations are also being constructed in Brazil (625 MW) and Mexico (670 MW). To judge from the available figures, hydroelectric power stations will be installed en masse to take the place of those using petroleum, and nuclear capacity will be rapidly expanded during the rest of the decade.

/Table 7

Table 7

LATIN AMERICA: TOTAL INSTALLED CAPACITY IN ELECTRIC POWER STATIONS

(MW)

| Country | 1965 | | | 1970 | | | 1972 | | | 1973 | | | 1974a/ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hidro-elec-tric | Thermo-elec-tric | Total | Hidro-elec-tric | Thermo-elec-tric | Total | Hidro-elec-tric | Thermo-elec-tric | Total | Hidro-elec-tric | Thermo-elec-tric | Total | Hidro-elec-tric | Thermo-elec-tric | Total |
| Argentina | 367 | 5 065 | 5 432 | 609 | 6 082 | 6 691 | 918 | 6 712 | 7 630 | 1 118 | 6 980 | 8 098 | 1 918 | 7 663 | 9 581 |
| Barbados | | | | - | 39 | 39 | - | 46 | 46 | - | 46 | 46 | - | 46 | 46 |
| Bolivia | 93 | 71 | 164 | 173 | 95 | 269 | 173 | 98 | 271 | 209 | 110 | 319 | 235 | 120 | 355 |
| Brazil | 5 391 | 2 020 | 7 411 | 6 828 | 2 405 | 11 233 | 10 987 | 2 503 | 13 490 | 12 832 | 3 106 | 15 938 | 14 727 | 3 256 | 17 983 |
| Colombia | 843 | 707 | 1 550 | 1 500 | 904 | 2 404 | 1 862 | 1 098 | 2 960 | 1 913 | 1 230 | 3 143 | 2 287 | 1 376 | 3 663 |
| Costa Rica | 109 | 57 | 166 | 182 | 62 | 244 | 241 | 12 | 313 | 242 | 115 | 357 | 242 | 115 | 357 |
| Cuba | 25 | 951 | 976 | 44 | 1 277 | 1 321 | 44 | 1 866 | 1 910 | 44 | 1 866 | 1 910 | 44 | 1 866 | 1 910 |
| Chile | 710 | 743 | 1 453 | 1 067 | 1 015 | 2 142 | 1 068 | 1 114 | 2 182 | 1 308 | 1 118 | 2 486 | 1 468 | 1 171 | 2 639 |
| Ecuador | 67 | 115 | 182 | 106 | 197 | 303 | 105 | 252 | 357 | 105 | 284 | 389 | 140 | 284 | 424 |
| El Salvador | 87 | 29 | 116 | 108 | 103 | 211 | 108 | 139 | 247 | 108 | 198 | 306 | 108 | 198 | 306 |
| Guatemala | 30 | 87 | 117 | 106 | 99 | 205 | 106 | 140 | 246 | 106 | 140 | 246 | 106 | 140 | 246 |
| Guyana | - | 81 | 81 | - | 112 | 112 | - | 121 | 121 | - | 129 | 129 | - | 129 | 129 |
| Haiti | - | 35 | 35 | - | 43 | 43 | 32 | 43 | 75 | 32 | 43 | 75 | 32 | 43 | 75 |
| Honduras | 33 | 39 | 72 | 30 | 80 | 110 | 70 | 92 | 162 | 68 | 82 | 150 | 68 | 106 | 174 |
| Jamaica | 22 | 181 | 203 | 20 | 381 | 401 | 20 | 481 | 501 | 20 | 578 | 598 | 20 | 600 | 620 |
| Mexico | 2 249 | 2 907 | 5 156 | 3 320 | 4 132 | 7 452 | 3 316 | 5 172 | 8 488 | 3 586 | 5 580 | 9 166 | 3 756 | 6 245 | 10 001 |
| Nicaragua | 57 | 74 | 131 | 57 | 107 | 164 | 107 | 155 | 262 | 107 | 155 | 262 | 107 | 155 | 262 |
| Panama | 9 | 99 | 108 | 14 | 172 | 186 | 15 | 238 | 253 | 9 | 252 | 261 | 9 | 317 | 326 |
| Paraguay | - | 58 | 58 | 90 | 64 | 154 | 90 | 76 | 166 | 90 | 106 | 196 | 90 | 146 | 236 |
| Peru | 693 | 604 | 1 297 | 923 | 754 | 1 677 | 1 057 | 873 | 1 930 | 1 285 | 888 | 2 173 | 1 399 | 955 | 2 354 |
| Dominican Republic | 8 | 170 | 178 | 15 | 285 | 300 | 15 | 281 | 296 | 95 | 285 | 380 | 95 | 361 | 456 |
| Trinidad and Tobago | - | 275 | 275 | - | 334 | 334 | - | 334 | 334 | - | 334 | 334 | - | 424 | 424 |
| Uruguay | 236 | 198 | 434 | 252 | 294 | 546 | 252 | 294 | 546 | 252 | 294 | 546 | 252 | 419 | 671 |
| Venezuela | 383 | 1 714 | 2 097 | 895 | 2 277 | 3 172 | 895 | 2 304 | 3 199 | 1 015 | 2 376 | 3 391 | 1 795 | 2 576 | 4 371 |
| Latin America | 11 412 | 16 513 | 27 925 | 18 339 | 21 373 | 39 712 | 21 481 | 24 517 | 45 998 | 24 604 | 26 295 | 50 899 | 28 898 | 28 711 | 57 609 |
| Percentage | 40.9 | 59.0 | 100.0 | 46.2 | 53.8 | 100.0 | 46.7 | 53.3 | 100.0 | 48.3 | 51.7 | 100.0 | 50.2 | 49.8 | 100.0 |

Source: ECLA, on the basis of official statistics.

a/ Estimates.

## B. PETROLEUM AND NATURAL GAS

### 1. Recent trends

#### (a) Production

During the five-year period 1965-1970 production of crude petroleum in Latin America showed an annual growth rate of 2.4 per cent, rising from 270 to 305 million cubic metres. If Venezuela, whose output increased by only 1.3 per cent, is excluded from these totals, the other countries achieved a net increase of 5.6 per cent, owing to the significant expansion which took place in Bolivia (21 per cent), Brazil (12 per cent), Argentina and Mexico (8 per cent and 6 per cent respectively) (see table 8).

In 1970-1973, in contrast, regional production of crude declined at an average annual rate of 0.4 per cent. This falling-off was due to the contractions in the output of Colombia, Chile, Argentina, and above all Venezuela, in all of which countries production continued to decrease in 1974. The increases in the output of the other countries, such as Bolivia, Brazil, Ecuador and Trinidad and Tobago, although on a relatively considerable scale, could not suffice to counteract the downward trend in the other countries.

Since these regional rates were lower than the world averages (9 per cent between 1965 and 1970 and 7 per cent between 1970 and 1973), they implied a significant reduction of Latin America's share in world output, which fell from 16 per cent in 1965 to 12 and 10 per cent in 1970 and 1973, respectively.

After dropping from 4,000 to 3,700 million cubic metres in 1965-1970, the region's proven reserves of crude slightly increased during the period 1970-1973. This expansion was largely due to the work done on extending old oilfields and reassessing recoverable volumes, and to the discovery of new deposits in the Amazonian jungles of Ecuador and Peru, off the shores of Trinidad and Tobago, and in the Golfo de la Vela basin in Venezuela. Reserves may be appreciably enlarged if satisfactory results are yielded by the measuring of volumes under way in the recently discovered deposits on the continental shelf off Río de Janeiro (Brazil), and in the States of Chiapas and Tabasco (Mexico). Initial estimates of their potential set it very high.

/Table 8

Table 8

LATIN AMERICA AND WORLD: PRODUCTION OF CRUDE PETROLEUM

(Thousands of $m^3$)

| Country | 1965 | 1970 | 1971 | 1972 | 1973 | Annual percentage growth rates | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1965-1970 | 1970-1973 |
| Argentina | 15 625 | 22 797 | 24 551 | 25 193 | 24 410 | 7.8 | 3.5 |
| Bolivia | 534 | 1 402 | 2 127 | 2 539 | 2 745 | 21.2 | 25.0 |
| Brazil | 5 460 | 9 685 | 10 114 | 9 712 | 9 876 | 12.2 | 0.6 |
| Colombia | 11 638 | 12 728 | 12 499 | 11 395 | 10 667 | 1.8 | -5.7 |
| Chile | 2 020 | 1 976 | 2 048 | 1 991 | 1 817 | -0.5 | -0.3 |
| Ecuador | 453 | 230 | 211 | 4 544 | 12 078 | -12.7 | 274.2 |
| Mexico | 21 008 | 28 238 | 28 187 | 29 157 | 30 442 | 6.1 | 2.5 |
| Peru | 3 668 | 4 176 | 3 592 | 3 759 | 3 977 a/ | 2.6 | -0.6 |
| Trinidad and Tobago | 7 769 | 8 116 | 7 496 | 8 142 | 9 646 a/ | 0.9 | 5.9 |
| Venezuela | 201 533 | 215 177 | 205 955 | 187 365 | 195 331 | 1.3 | -3.2 |
| Total | 267 708 | 304 525 | 296 780 | 283 797 | 300 989 | 2.4 | -0.4 |
| Total (excluding Venezuela) | 68 175 | 89 348 | 90 825 | 96 482 | 105 658 | 5.6 | 5.8 |
| World | 1 740 470 | 2 610 800 | 2 779 122 | 2 884 281 | 3 179 200 | 8.5 | 6.8 |

Source: For Latin America, ECLA, on the basis of official statistics; for the world, data from the Oil and Gas Journal.

a/ Provisional figures.

/The region's

The region's share in proven world reserves increased slightly in 1973, reaching 5 per cent, after having fallen from 7 per cent to 4 per cent between 1965 and 1970. The reserve-output ratio in Latin America in 1973 was 17 years, as against a world average of 29 years.

Not only did the level of proven reserves fall between 1965 and 1970, but also the number of exploratory wells drilled in the region decreased. The explanation of these contractions lies partly in the increase in exploration and development costs, and partly in the stagnation and decline of world market petroleum prices during this period. In 1970-1973, in contrast, there was a recrudescence of exploration, as a result of which the level of proven reserves has risen.

Under the pressure of the increasingly high and rapid increases in world market petroleum prices, the Latin American countries stepped up the search for oil in more difficult locations and conditions and in fields which had formerly been considered marginal and anti-economic because of their high costs. They also set about more intensive development of the petroleum contained in bituminous sand (the Orinoco oil belt in Venezuela) and oil shales (San Mateos, Brazil).

Gross output of natural gas, most of which is associated with petroleum in Latin America, followed the downward trend of production of crude in 1970-1973. The annual growth rate of natural gas production, which had been 4 per cent between 1965-1970, dropped to 2 per cent in 1970-1973. In the latter period the increases over the 1965-1970 figures were higher in Bolivia, Argentina and Colombia than the average for the region, but several countries showed negative trends, i.e., Brazil, Chile, Ecuador, Peru and Trinidad and Tobago (see table 9).

Thanks to the discoveries of natural gas made in the Guajira Peninsula (Colombia), the Gulf of Guayaquil (Ecuador), the Gulf of Paria (Trinidad and Tobago) and the Palometas field (Bolivia), the status of reserves has considerably improved. According to the Oil and Gas Journal, reserves of natural gas in the region were estimated at 1,778 and 1,930 thousand million cubic metres in 1965 and 1970, respectively. In 1973 they reached 2,856 thousand million cubic metres.

/Table 9

Table 9

LATIN AMERICA: GROSS OUTPUT OF NATURAL GAS

(Millions of $m^3$)

| Country | 1965 | 1970 | 1971 | 1972 | 1973a/ | Annual percentage growth rates 1965-1970 | Annual percentage growth rates 1970-1973 |
|---|---|---|---|---|---|---|---|
| Argentina | 6 236 | 7 665 | 8 117 | 8 317 | 8 914 | 4.2 | 5.2 |
| Bolivia | 212 | 866 | 2 297 | 3 424 | 4 281 | 32.7 | 70.2 |
| Brazil | 683 | 1 264 | 1 177 | 1 242 | 1 180 | 13.1 | -2.3 |
| Colombia | 2 658 | 2 971 | 3 158 | 3 274 | 3 400 | 2.2 | 4.6 |
| Chile | 6 215 | 7 628 | 7 986 | 8 073 | 7 376 | 4.2 | -1.1 |
| Ecuador | 251 | 104 | 94 | 88 | 90 | -16.1 | -4.7 |
| Mexico | 13 965 | 18 839 | 18 222 | 18 697 | 19 169 | 6.2 | 0.6 |
| Peru | 1 847 | 2 119 | 1 923 | 1 831 | 1 950 | 2.2 | -2.7 |
| Trinidad and Tobago | 3 263 | 3 053 | 2 826 | 2 768 | 2 960 | -1.3 | -1.0 |
| Venezuela | 40 846 | 48 427 | 47 579 | 46 020 | 49 400 | 3.5 | 0.7 |
| Total | 76 176 | 92 936 | 93 379 | 93 734 | 98 720 | 4.1 | 2.0 |

Source: ECLA, on the basis of official statistics.
a/ Provisional data.

/(b) Refining

(b) Refining and consumption

Between 1965 and 1970, Latin America's oil refining capacity increased at an annual rate of 4.2 per cent, which was higher than the growth rate of 2.4 per cent recorded for production of crude during the same period. In 1970-1973 its annual rate of expansion fell short of 4 per cent. Out of the 22 countries considered, only Argentina, Brazil, Colombia, Cuba, Peru and Venezuela achieved increases which exceeded the average rate for the region (see table 10).

In 1973, the refineries of the Latin American countries processed 242 million cubic metres, as against the 218 million that had been refined in 1970 (see table 11); this implies an average annual growth rate of 3.6 per cent, lower than the 1965-1970 rate of 4.8 per cent. This reduction was largely due to the contraction that took place in the two leading refiner and exporter countries of the region: Venezuela and Trinidad and Tobago.

If the evolution of production of crude oil in 1965-1973 is compared with that of the volume of crude processed in the countries that are the principal producers and net importers of crude, i.e. Argentina, Brazil and Chile, the following facts will be noted: in Argentina, the share of domestic crude in the total amount of crude processed, after rising from 80 per cent in 1965 to 93 per cent in 1970, fell to 89 per cent in 1973; in Chile it plunged from 74 per cent in 1965 to 40 per cent in 1970, and then was still farther reduced during subsequent years, until by 1973 it had dwindled to only 32 per cent; in Brazil, it was 23 per cent in 1973, which implied a slump in relation to the 1965 and 1970 figures of 71 per cent and 32 per cent, respectively (see again tables 8 and 11). These trends had an unfavourable effect on the external petroleum trade balance of the countries concerned.

/Table 10

Table 10

LATIN AMERICA: CRUDE OIL REFINING CAPACITY

(Thousands of $m^3$ daily)

| Country | 1965 | 1970 | 1971 | 1972 | 1973 | Annual percentage growth rates | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1965-1970 | 1970-1973 |
| Argentina | 67.3 | 72.5 | 100.1 | 95.7 | 99.2 | 1.5 | 11.0 |
| Bolivia | 1.9 | 3.7 | 3.6 | 3.5 | 4.1 | 14.2 | 3.5 |
| Brazil | 58.0 | 80.2 | 89.7 | 114.2 | 125.9 | 6.7 | 9.4 |
| Colombia | 15.9 | 21.9 | 27.6 | 27.4 | 26.4 | 6.6 | 6.4 |
| Chile | 13.3 | 17.6 | 21.6 | 19.6 | 19.6 | 5.8 | 3.7 |
| Ecuador | 3.1 | 5.6 | 5.8 | 5.6 | 5.6 | 12.5 | 0.0 |
| Paraguay | - | 0.8 | 0.8 | 0.8 | 0.8 | - | 0.0 |
| Peru | 10.0 | 14.5 | 16.8 | 16.1 | 17.0 | 7.8 | 5.5 |
| Uruguay | 5.6 | 6.4 | 6.8 | 6.4 | 6.8 | 2.7 | 2.0 |
| Venezuela | 190.8 | 216.9 | 218.8 | 238.3 | 243.5 | 2.6 | 3.9 |
| Central America | 14.5 | 23.8 | 24.1 | 23.8 | 23.8 | 10.4 | 0.0 |
| Mexico | 66.9 | 91.3 | 94.1 | 99.3 | 99.4 | 6.4 | 2.9 |
| Barbados | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.0 | 0.0 |
| Cuba | 13.8 | 14.8 | 14.8 | 14.8 | 19.4 | 1.4 | 9.5 |
| Jamaica | 4.2 | 5.6 | 5.6 | 4.9 | 5.2 | 5.9 | -2.5 |
| Dominican Republic | - | - | - | 2.5 | 7.3 | - | - |
| Trinidad and Tobago | 61.2 | 69.6 | 73.8 | 70.1 | 73.3 | 2.6 | 1.7 |
| Total | 527.0 | 645.7 | 704.5 | 743.5 | 777.8 | 4.2 | 3.8 |

Source: Oil and Gas Journal (several issues).

/Table 11

Table 11

LATIN AMERICA: VOLUMES OF CRUDE OIL REFINED

(Millions of $m^3$)

| Country | 1965 | 1970 | 1971 | 1972 | 1973a/ | Annual percentage growth rates | |
|---|---|---|---|---|---|---|---|
| | | | | | | 1965-1970 | 1970-1973 |
| Argentina | 19.5 | 24.5 | 26.7 | 26.9 | 27.4 | 4.7 | 3.8 |
| Bolivia | 0.5 | 0.7 | 0.8 | 0.8 | 1.0 | 7.0 | 12.6 |
| Brazil | 17.8 | 29.6 | 30.8 | 38.0 | 42.6 | 10.7 | 12.9 |
| Colombia | 5.3 | 7.9 | 8.4 | 9.0 | 9.6 | 8.4 | 6.7 |
| Chile | 2.7 | 4.4 | 5.8 | 6.0 | 5.6 | 10.3 | 8.4 |
| Ecuador | 0.9 | 1.4 | 1.5 | 1.6 | 1.8 | 9.2 | 8.7 |
| Paraguay | - | 0.2 | 0.2 | 0.2 | 0.2 | - | 0.0 |
| Peru | 3.4 | 4.6 | 5.1 | 5.3 | 5.5 | 6.2 | 6.2 |
| Uruguay | 1.8 | 2.0 | 2.0 | 1.9 | 1.9 | 2.2 | -1.4 |
| Venezuela | 68.2 | 75.0 | 72.3 | 65.5 | 75.4 | 1.9 | 0.2 |
| Central America b/ | 3.5 | 6.1 | 6.9 | 7.0 | 7.5 | 11.8 | 7.1 |
| Mexico | 21.4 | 29.1 | 29.2 | 30.5 | 32.6 | 6.3 | 3.9 |
| Cuba b/ | 4.4 | 6.0 | 6.2 | 6.5 | 6.6 | 6.4 | 3.3 |
| Jamaica | 1.7 | 1.8 | 1.7 | 1.6 | 1.7 | 1.1 | -1.9 |
| Trinidad and Tobago | 21.8 | 24.6 | 23.1 | 22.1 | 23.2 | 2.4 | -1.9 |
| Total | 172.9 | 217.9 | 220.7 | 220.9 | 242.6 | 4.8 | 3.6 |

Source: ECLA, on the basis of official statistics.

a/ Provisional data.

b/ Figure partly estimated.

/Expressed in

Expressed in tons of petroleum equivalent (10,700 kcal/kg), Latin American consumption of hydrocarbon fuels (petroleum products and natural gas), including consumption in the petroleum industry itself, increased from 93 million in 1965 to 131 million in 1970, i.e. at an annual rate of 7 per cent. In 1970-1973, however, this growth rate slowed down a little (to 6.7 per cent per annum), largely because of the high petroleum prices.

(c) Trends in international petroleum prices and trade

Between 1958 and 1970 the price of crude oil from Saudi Arabia (in dollars at current prices) fell from about 1.83 to 1.26 dollars per barrel (FOB Persian Gulf). Then it abruptly soared until by January 1974 it had reached 7.65 dollars per barrel. At the present time, the price of this key crude stands approximately at 10.46 dollars per barrel.4/ Price trends in the case of crude petroleum from Saudi Arabia give an indication of the general pattern.

The heavy increases in world petroleum prices since 1973 have had profound repercussions on the Latin American petroleum market. The net exporter countries (Venezuela, Ecuador, Bolivia and Trinidad and Tobago) also raised their petroleum prices. Between January 1973 and January 1974, Bolivia pushed up the sales price of its crude from 2.90 to 16.00 dollars per barrel, with successive intervening increases in the months of July (to 3.50 dollars) and November (to 7.44).

In 1973 the value of Bolivia's sales of hydrocarbons (crude oil and natural gas) amounted to 67 million dollars, with a favourable balance of 64 million dollars on the petroleum account. This surplus far outstripped the 1970 figure of 12 million dollars.

Over the same period, reference prices in Ecuador rose from 2.60 to 13.70 dollars per barrel, that is, by 11.10 dollars, with different prices in the months of April (2.90), May (3.20), June (3.60),

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4/ Petroleum Intelligence Weekly, 25 November 1974.

/October (5.25)

October (5.25) and November (7.30). These price variations brought about a substantial improvement in the value of Ecuador's net exports of crude, which in 1973 reached over 250 million dollars.

Venezuela, the region's leading exporter of crude oil and petroleum products, lowered the petroleum dollar exchange rate for the second time in February 1973, from 4.30 to 4.20 bolívares (the first reduction was in 1972, from 4.40 to 4.30 bolívares) and established new export values for its crudes and products. The average export value of crude was raised between January and December 1973 from 3.04 to 6.43 dollars per barrel and that of petroleum products from 3.25 to 6.43 dollars, net of increases under the head of freight charges, which rose over the same period from 34 to 69 dollar cents per barrel. As a result, the share accruing to Venezuela through taxation climbed from 1.86 dollars per barrel in January to 2.63 in October and 3.99 in November and December 1973: exports amounted to over 4,000 million dollars.

The Latin American importers have had to face up to a corresponding increase in the cost of fuel from abroad. At the beginning of 1973, for instance, Brazil was paying 3.0 dollars CIF per barrel of crude, a figure which rose to 3.87 dollars in September and to 5.00 dollars and a little over in the last three months of 1973. At an average price of 3.83 dollars per barrel, imports of petroleum represented the sum of 1,153 million dollars in 1973.

Argentina paid, on an average, 5.47 dollars CIF per barrel of crude, buying 21.4 million barrels for a value of 117 million dollars; this volume and value signified increases of 96 and 243 per cent, respectively, in relation to 1972. If purchases of natural gas and petroleum products are also taken into account, expenditure on imports works out at 191 million dollars.

The new prices also had an impact, and a powerful one, on Chile, Peru and the non-petroleum-producing countries, like Uruguay, Paraguay, and the countries of Central America and the Caribbean, all of which are extremely vulnerable to the international situation.

/Many countries,

Many countries, therefore, especially those dependent on petroleum, found themselves compelled to raise the prices of the various petroleum products sold to the public, in order to cover their increasing costs and rationalize consumption. Table 12 shows the changes in the prices charged for petrol (to the consumer and net of taxes) that took place in several Latin American countries between October 1973 and April 1974; for purposes of comparison, the same changes in other countries of the world are also presented.

To sum up, in 1973 Latin America's foreign trade balance in respect of hydrocarbons showed a surplus of about 2,600 million dollars, i.e., almost three times as large as the favourable balance in 1965 and twice the 1970 figure. If Venezuela's exports are excluded from the total, the region appears with a deficit in 1973 of over 1,600 million dollars, as against 393 and 578 million dollars in 1965 and 1970, respectively.

The chief repercussions on the Latin American countries produced by the abrupt upswing in world petroleum prices as from 1973, and making themselves felt in inflationary pressures, employment and production, and the balance of payments, are discussed in Part Two of the present document, chapters I and IV.5/

(d) Questions relating to regional integration and co-operation

Further giant strides were made in the field of integration at a meeting held in Lima in November 1973, when the Latin American Energy Organization (OLADE) was established; its main objectives are the integration, protection, conservation, rational utilization, marketing and defence of the region's energy resources.

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5/ The analysis prepared by the ECLA secretariat for the Technical Symposium on Latin America and Current Energy Problems (Santiago, Chile, 23 to 27 September 1974) can be found in the working paper presented at the Symposium under the same title (ST/CEPAL/Conf.50/L.2, pages 45 to 105).

/Table 12

Table 12

WORLD RETAIL PRICES OF HIGHER-OCTANE PETROL

(Dollars per gallon)

| Country | April 1974 | | October 1973 | |
|---|---|---|---|---|
| | At filling-station | Net of tax | At filling-station | Net of tax |
| Wester Hemisphere | | | | |
| Argentina | 1.441 | 0.705 | 0.721 | 0.361 |
| Brazil | 1.290 | 0.988 | 0.642 | 0.453 |
| Colombia | 0.191 | 0.108 | 0.195 | 0.110 |
| El Salvador | 0.728 | 0.471 | 0.600 | 0.343 |
| Guatemala | 0.669 | 0.444 | 0.500 | 0.284 |
| Honduras | 0.880 | 0.682 | 0.530 | 0.332 |
| Jamaica | 1.095 | 0.620 | 0.508 | 0.343 |
| Nicaragua | 0.797 | 0.519 | 0.500 | 0.284 |
| Panama | 0.860 | 0.492 | 0.503 | 0.278 |
| Paraguay | 1.802 | 1.513 | 0.811 | 0.547 |
| Puerto Rico | 0.656 | 0.496 | 0.427 | 0.317 |
| Uruguay | 1.843 | 0.914 | 1.088 | 0.532 |
| Venezuela | 0.270 | 0.171 | 0.270 | 0.170 |
| Canada | 0.641 | 0.450 | 0.529 | 0.342 |
| United States | 0.556 | 0.436 | 0.428 | 0.308 |
| Europe | | | | |
| Austria | 1.130 | 0.555 | 0.964 | 0.406 |
| Belgium | 1.141 | 0.379 | 1.163 | 0.334 |
| Denmark | 1.300 | 0.581 | 1.052 | 0.364 |
| Finland | 1.159 | 0.629 | 0.981 | 0.357 |
| France | 1.357 | 0.612 | 1.127 | 0.328 |
| Greece | 2.070 | 1.470 | 1.010 | 0.500 |
| Ireland | 0.964 | 0.509 | 0.755 | 0.289 |
| Italy | 1.582 | 0.592 | 1.240 | 0.330 |
| Norway | 1.482 | 0.615 | 1.138 | 0.401 |
| The Netherlands | 1.381 | 0.532 | 1.195 | 0.396 |
| United Kingdom | 0.994 | 0.556 | 0.785 | 0.333 |
| Federal Republic of Germany | 1.406 | 0.601 | 1.260 | 0.442 |
| Sweden | 1.191 | 0.538 | 1.090 | 0.452 |
| Switzerland | 1.017 | 0.469 | 0.972 | 0.376 |
| Far East | | | | |
| Australia | 0.687 | 0.410 | 0.533 | 0.332 |
| Hong Kong | 0.860 | 0.565 | 0.630 | 0.330 |
| Japan | 1.429 | 0.981 | 0.928 | 0.520 |
| Malaysia | 0.863 | 0.430 | 0.811 | 0.342 |
| Republic of Vietnam | 1.502 | 0.357 | 0.454 | 0.166 |
| Singapore | 1.085 | 0.572 | 0.793 | 0.317 |
| Thailand | 0.670 | 0.394 | 0.435 | 0.261 |

Source: Petroleum Intelligence Weekly, 26 August 1974. p. 4.

/This is

This is an appropriate place to draw attention to the agreements concluded at Ciudad Guayana in December 1974 between the Government of Venezuela on the one side and the Governments of the six countries of the Central American Isthmus on the other. These agreements embodied decisions to create and improve defence mechanisms for the external marketing of the countries' raw materials and primary commodities (coffee), by means of measures established to prevent the deterioration of the terms of trade.

In particular, bases were concerted for facilitating the financing of imports of Venezuelan petroleum, a step that immediately strengthened the balance-of-payments position of the Isthmus countries. This financing in its turn will permit the execution of investment programmes and projects that will play a basic part in the utilization of the Central American countries' natural resources and the promotion of their exports, thus stepping up the progress of regional economic integration movements and the development of trade between Central America and Venezuela.

Furthermore, Bolivia and Brazil signed an Act of Co-operation in the field of hydrocarbons, in which several questions of vital importance are considered. One of them is the construction of a gas pipeline from Santa Cruz de la Sierra to the industrial area of Sao Paulo, to carry a minimum volume of 7.2 million cubic metres daily (about 250 million cubic feet) of natural gas, which Brazil wishes to purchase from Bolivia.

/2. Measures

## 2. Measures which might be considered by the Latin American oil-deficit countries 6/

Today many investment projects would turn out to be viable which were rejected because they were not economically feasible when the costs of energy were lower. For example, in the energy sector a number of hydroelectric projects which only a year ago had no economic justification, would now prove highly desirable if the present structure of energy costs were to be maintained in the future; while, on the other hand, the incentive to invest in electric power stations operating with fuel oil would be greatly weakened. In the same way, the striking increase in the world cost of petroleum has radically altered the economic viability pattern of secondary industries, by creating opportunities for the installation of new industries based on import substitution and calling in question the feasibility of other established industries which make intensive use of energy. Where transport is concerned, the higher cost of energy makes it needful to review the relative advantages of mass transport projects, as well as the expediency, from the fiscal standpoint, of the existing patterns of freight carriage by rail and road in many countries.

Clearly, the potential scope of the structural change desirable if present energy costs persist in the future would give rise to immense requirements of foreign and domestic capital. In these circumstances, the source of pressure is obvious: the higher cost of imported petroleum, which, on the one hand, is the basic cause of the need for additional investment, and on the other, is largely the reason why the Latin American countries find themselves incapable of making such investment on the necessary scale. In such a context, the success achieved in the sphere of international trade and financial policy will have a much stronger influence on the extent to which a national investment policy, directed towards structural reforms, can be effectively implemented.

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6/ This last section is largely based on the following documents: "Latin America and the current energy problems", op. cit.; and "The new oil prices and the Latin American electricity industry", op. cit.

/What lines

What lines of action would be potentially open to the oil-deficit countries as means of tackling the problems posed by the maintenance of the new oil price levels over the rest of the 1970s?

For the purposes of the analysis, the energy policies that may be adopted by the Latin American oil-deficit countries vis-a-vis anticipated world prices of crude up to 1980 had to be considered in two broad groups, namely:

(a) measures designed to reduce demand for imported petroleum;

(b) measures affecting the unit cost of supplies of imported petroleum.

(a) Measures designed to reduce demand from imported crude

The assumption that the structure of crude oil prices will persist up to 1980 implies that, although with great variations from one country to another, foreign exchange reserves will probably continue to fall sharply on account of imports of petroleum in the oil-deficit countries of the region.

To mitigate this effect it would be desirable to slow down the growth rate of demand for imported crude and for imported refined products, but in such a way as to reduce to a minimum the threat to domestic production and employment.

With the exception of Guyana and Haiti, all the oil-importing countries in the region satisfy their domestic needs for petroleum products by refining imported crude (and, in five countries, domestically-produced crude as well), and supply the differences between the output of the refineries and their home market requirements with purchases in the foreign market (and changes in inventories). The typical refining strategy of these countries is aimed at minimizing imports of petrol; thus, owing to a certain technological rigidity in the refineries, production of petrol determines the supply of other domestically-refined petroleum products. The measures affecting internal demand for petrol are of special strategic importance for the countries that are endeavouring to cut down to a minimum their foreign exchange expenditure on petroleum, for various reasons:

/Firstly, in

Firstly, in the Latin American oil-deficit countries, consumption of petrol normally represents about one-third of total consumption of refined products;

Secondly, petrol is the derivative which offers the greatest possibilities for reducing domestic consumption of oil with relatively less risk to domestic production and consumption than in the case of other refined products. For example, if supplies of fuel oil, diesel oil or petrochemical naphthas were substantially restricted, the danger to the total product and total employment would be much more serious;

Thirdly, although a contraction of demand for petrol might cause imbalances between requirements of "essential" petroleum products and domestic output, this problem can be tackled by means of imports to cover the deficit. Furthermore, the composition of crudes can be varied in accordance with new production targets for the refineries; and from this point of view reconstituted crudes may be included.

One of the difficulties connected with the adoption of measures to influence demand for petrol is that, even if the higher cost of imported crude is transferred to the consumer, the resulting increase in the price of petrol may not suffice to hold back the rate of consumption (in other words, even at the higher price, consumers might consider it financially worth their while to use petrol to meet their private needs, in respect of transport, for example). The problem can be dealt with by setting a ceiling for supplies of petrol (in relation to the projected status of foreign exchange reserves), and rationing its use by means of the price mechanism, through heavier taxation on petrol. This approach would raise the cost of private road transport, thus providing inducement to supersede it by public transport services at a lower unit cost, with the resultant saving of foreign exchange. Naturally, to facilitate a gradual relative shift from private to public transport services, authorities and technical experts would have to draw up plans in co-ordination with the energy and transport sectors.

/A second

A second important way of curtailing the growth of domestic demand for imported petroleum is to increase the domestically-produced supply of lower-cost energy substitutes. Given the assumptions formulated above as to the price of imported crude, it is obvious that many energy supply projects based on domestically-produced fuels, which were formerly anti-economic, will now be viable both from the financial and from the economic standpoint.

In this context the essential problem is the time factor, since it will take several years for such projects to become operative. Investment projects that are economically justified - for example, hydroelectric and nuclear power plant, transmission and distribution of natural gas, coal production and marketing projects, etc. - take a considerable time to reach the stage of production, and cannot be expected to do much during the 1970s to relieve the economic situation of the oil-deficit countries of the region. The chief difficulty lies not in identifying such projects, but rather in financing them.

In this connexion, attention has been drawn in several circles to the urgent need for the Latin American oil-deficit countries to have access to a revolving fund for the financing of petroleum projects and projects in the energy sector in general, for which it might not be possible to expect external support on the requisite scale through the traditional channels of international credit. Despite the financial difficulties that would be implied by the creation of a fund of this type, its establishment deserves serious and immediate consideration.

A task that must be undertaken in the immediate future is a complete review of the energy projects at present under study.

Perhaps it may be possible to convert some projects for the generation of electric energy, based on imported petroleum products, to the use of lower-cost domestically-produced fuels. Furthermore, imports of pleasure vehicles might also be restricted in some countries, which would be a means of saving foreign exchange not only under the head of petroleum, but also - and this is quantitatively important - on the importing of the vehicles themselves.

/The possibility

The possibility of substituting domestically-produced resources for petroleum is very largely based on the electric energy industry. The necessity of revising prices of petroleum products means that this industry must follow suit. Care is required, since on the one hand it is imperatively necessary to keep the unit cost of electricity at a relatively low level, in order to avoid creating a threat to domestic production and employment; and, on the other hand, low household electricity tariffs, in conjunction with a rise in the price of petroleum products, might lead to substitutions of one source of energy for another which would turn out to be inexpedient from the standpoint of saving of foreign exchange.7/

From the strategic standpoint, the sector that lends itself best to the introduction of increases in electricity tariffs is household consumption - which is quantitatively important -, since it is one in which relatively considerable economies can be made without too adverse an effect on production and employment. This need is particularly marked in the oil-deficit countries whose electric energy industry is based on generators using petroleum.

Apart from fostering the substitution of domestic sources of energy for petroleum in electricity production, the high price of oil has meant that investment in improving the efficiency of electric energy transmission and distribution systems is even more attractive than before. There is a relatively high ratio between the losses in the systems and the energy generated in the deficit countries. Once again, as in the case of projects directed towards increased use of domestically-produced fuels for the generation of electricity, the chief problem posed by projects designed to improve efficiency is not so much identifying them as financing them.

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7/ For example, if there were a marked rise in the price of kerosene in order to check the growth of petroleum imports without at the same time altering household electricity tariffs, consumers might switch over from kerosene heating to heating by electricity. In that event, if the energy industry were highly dependent upon power stations operating on the basis of fuel oil and diesel oil, the result might be an expansion of demand for imported petroleum which would tend to defeat the ends pursued.

/Bigger supplies

Bigger supplies of lower-cost domestically-produced crude involve a special advantage, the prospects of which vary greatly from one deficit country to another. As noted earlier, only five of them produce crude oil. These can expand their production and development activities forthwith, and thus reduce the drain on their foreign exchange reserves represented by imports of crudes. In view of the margins anticipated for world oil prices up to 1980, the output of deposits currently exploited and the development of known oilfields can be stepped up within certain limits, and a wide range of additional recovery procedures may be economically justifiable, despite the increase in the cost per unit of output. Insofar as it is possible to expand production of domestic crude at a rapid pace, while at the same time exerting vigorous pressure to reduce domestic consumption of petroleum, one or two of the deficit countries may even be able to sell part of their crude at its opportunity cost on the world market.

The alternatives open to the other fourteen deficit countries are to continue depending upon imported petroleum, to launch national exploration programmes or, as will be shown later, to invest in petroleum projects outside the national territory, whether Latin American or extra-regional. For many of these countries, the want of geological surveys of their reserves of oil and other energy resources, together with the length of time that the corresponding exploration programmes take to materialize, will preclude any significant recourse to this economic palliative during the 1970s.

A third way of reducing demand for imported crude is to improve the efficiency of the energy systems that will have to continue using it. Apart from the above-mentioned plant for the generation, transmission and distribution of electricity, the main energy consumers are private cars, lorries, buses, locomotives, ships, aircraft, industrial boilers and household heating. In the United States, for example, laws have been passed to lower speed limit for cars and thus to increase the average distance covered per litre of petrol consumer; and projects have been put forward for allowing tax deductions to taxpayers who improve insulation systems in buildings. This list could

/be expanded:

be expanded: inspection programmes might be introduced with a view to increasing the thermal efficiency of cars, lorries, buses, etc.; the cruising speed of aircraft could be regulated in order to boost fuel yields; other inspection programmes might be established to improve the efficiency of energy utilization in industry, and so forth.

Generally speaking, these proposals have perhaps received more praise than they merit. At best, any saving in fuels achieved by their means will be, in the economic sense, little more than the consumers themselves would save as a natural reaction to an increase in the price of petroleum products. The incentive for consumers to make a given fuel go farther depends upon its price among other factors, and for governments it is much easier to attain this goal by directly raising the prices of petroleum products than by applying large-scale programmes to induce consumers to change their habits. For example, when prices of petrol for cars and of diesel oil are comparatively low, the financial incentive to tune the engine is not as powerful as when they are relatively high; and similarly, when the price of electricity, kerosene, natural gas and other household fuels rises, there are more inducements to use them thriftily.

One possible way of improving energy efficiency which deserves immediate consideration is that the government should carry a relatively larger proportion of its freight by rail or by sea, as the case may be, instead of by lorry. If the capacity of these media permits, the energy consumed per unit of freight carried could be reduced, and at the same time foreign exchange could be saved. Furthermore, over the longer term, it may perhaps be economically feasible in some countries to instal systems using electric engines and trolley-buses, for example, and to plan the expansion of hydroelectric plant with a view to the introduction of these forms of traction. This of course involves a sweeping improvement in the services concerned, and here too an essential requisite is co-ordination between the energy and transport sectors for the evaluation of such possibilities.

The inter-connexion of national electricity systems offers another possibility of saving oil-generated energy. In view of the high cost

/of this

of this latter, investment in such interconnected systems now becomes much more desirable. In countries that use hydroelectric energy (and other domestically-produced fuels) in combination with imported petroleum to generate electric energy, such investment would slow up the growth rate of the unit cost of electricity (and might even lower it in absolute terms), while at the same time petroleum would be saved. Even in systems that are completely dependent on petroleum for the generation of electricity, oil requirements per kWh might be reduced if generation were concentrated in larger and more efficient power stations.

As in previous cases, however, the lead time of such projects would not allow very much saving in consumption of petroleum to be effected in the course of the present decade. Over the longer term the basic problem would be to obtain the financing for innovations of this kind, which generally entail substantial investment.

Clearly, then, the problem of the restructuration of prices of final energy delivered to consumers must be tackled on an integrated basis at the earliest possible moment, not only from the standpoint of the prices of petroleum products but also with due regard to the relation between these and other energy resources (for example, electricity, natural gas and coal). As regards the petroleum industry, it is not rational to fix the price of petrol without considering the price of diesel oil, nor can the price of kerosene for household consumption be determined without reference to the price of other liquid petroleum products which are also used for household heating. Neither can the price of fuel oil be established without taking into account the price of natural gas and coal used as fuel for industrial boilers, or the price of naphthas for the petrochemical industry without bearing in mind the price of natural gas utilized for the same purposes.

In short, what is needed is a co-ordinated criterion for energy planning in the deficit countries, which is becoming increasingly necessary, and should be based on an overall economic development strategy, with due regard to estimates of the future world market price of crude. Study must be devoted to the patterns of fuel

/consumption desired

consumption desired and then to the requisite investment in the energy sector (and in other key sectors, such as transport).

It is obvious at a glance that this procedure must be followed in all the oil-deficit countries in the world. In some Latin American countries, however, the rigidity of fuel consumption patterns and the relatively small volume of consumption of "non-essential" energy makes the application of co-ordinated energy planning criteria particularly indispensable, in order to put into practice efficaciously, and on an appreciable scale, measures to reduce the consumption of oil-based energy envisaged for the countries of the region, or to replace it by energy from other sources.

There are two other major areas of action in which planning can now be applied in this field: first, the joint utilization by the Latin American countries of their multinational hydroelectric energy resources; and secondly, the interconnexion of electricity systems across national frontiers.

Possibilities of bringing down the growth rate of the cost of electricity supplies are open to the deficit countries of the region if in the production of hydroelectric energy they succeed in substituting hydropower itself for petroleum and replacing costly inputs by other of lower cost; at the same time, they could thus effect a saving of their foreign exchange reserves.

Nevertheless, in this case too it is unrealistic to expect that the growth rate of demand for imported crude can be greatly reduced over the 1970's by means of these two types of projects. Their lead time is too protracted for an appreciable reduction to be achieved and, particularly where multinational projects for the utilization of hydroelectric resources are concerned, capital requirements will be prohibitive for many of the deficit countries, unless they receive external aid on concessionary or semi-concessionary terms. This does not mean, however, that it is not important to make an immediate start on planning for the possible introduction of such projects in the future.

/(b) Measures

(b) Measures that might make for a reduction of the unit cost of crude

The policy measures previously reviewed had as their immediate objective the reduction, in economically justifiable conditions, of the growth rate of demand for imported crude. The mechanisms that could be used to attain this goal included taxes on consumption of petroleum products, the substitution of domestically-produced fuels for imported petroleum, more efficient utilization of petroleum products and, at the international level, the execution of projects, the interconnexion of national systems and regional utilization of hydroelectric energy.

The immediate aim of the measures or policies considered in the present section is to secure supplies of imported crude at a lower unit cost, with a view to slowing down the rate of increase of unit costs of production and saving foreign exchange reserves.

The Latin American deficit countries which are seeking to bring down the cost of the petroleum they import have several options: firstly, encouragement by buyers of normal competition among sellers on the world petroleum market; secondly, taxation on sales of petroleum products (a measure suggested in the foregoing section, in a different context); and, thirdly, the application of measures based on the exercise by the Latin American governments of more centralized control over their domestic petroleum industries.

In the first place, the deficit countries can pin many hopes of obtaining reductions in petroleum import prices on competition between sellers, spurred by buyers (and not only by Latin American buyers) operating on the world petroleum market. Up to the present decade, such action mainly implied stimulating competition among the leading international petroleum companies, and between each of them and the smaller international enterprises and those petroleum-exporting governments which had surpluses of crude, but insufficient distribution channels. Since then, control over world supplies of crude has gradually passed into the hands of the petroleum-exporting countries.

These countries are expected to tighten up their control over petroleum still more in what remains of the 1970's, and in many cases

/to continue

to continue maintaining close links with the international petroleum companies, since the national authorities and the transnational enterprises are necessary to one another from the commercial point of view.

The degree of success achieved by world market buyers, therefore will reflect, as before, their skill in promoting competition among the oil companies, but it will also reflect, and to an increasing extent, their success in developing other modus operandi, such as direct purchases from the governments of producer countries. In this way, not only can middlemen be dispensed with, but broader intergovernmental trade operations can be effected which will enable purchasers to make additional exports and more easily meet the cost of their petroleum purchases.

In essence, the deficit countries of the region are faced with the practical problem of meeting the material and financial requisites for keeping up their imports of petroleum, without shelving the possibility of reducing the unit cost of those imports in the future. One of the principal issues involved in the achievement of a proper balance is the treatment accorded to imports of crude under long-term purchase contracts.

If it is believed that during the 1970's crude oil prices are more likely to decline significantly than to increase (in dollars at constant prices), two important measures should be considered: firstly, if the government of a deficit Latin American country thought it necessary to conclude long-term supply contracts, its interests would best be served by the negotiation of price reduction clauses, so that prices could be adjusted to any downward movement occurring on the world market; and, secondly, legislation would have to be introduced in the deficit countries prohibiting refiner companies affiliated to international oil companies from assuming petroleum import commitments without the prior approval of the central government.

The establishment of taxation on sales of petroleum products, especially in countries which have a large petroleum market, may help

/to bring

to bring down prices of petroleum imports, if they are widely applied in countries which import on a large scale. This measure is necessary in many Latin American deficit countries because of the drain on foreign exchange mentioned above. In this connexion, sales taxes on petroleum products would have the possible additional advantage of inducing sellers to absorb them, which might reduce the purchase cost of imported petroleum.

With the same end in view, two other types of measures may be adopted: firstly, centralization of imports of petroleum in the hands of the governments of the deficit countries, in cases where this control does not already exist; and, secondly, establishment of a lower value for the unit cost of crude used for accounting purposes in refineries affiliated to the integrated international oil companies, when this cost is higher than that quoted in the sector of the world market where bargaining capacity is greatest.8/

When the sole local purchaser of imported petroleum is an enterprise affiliated to an international petroleum company, there is no competition between it and the parent exporter firm and the price of crude corresponding to the transfer is not a price in the economic sense of the term. The centralization of imports in the hands of the State has the potential advantage of reducing the price of petroleum imports inasmuch as it introduces competition between the buyer (the State) and the seller of crude. Furthermore, when local companies purchase the petroleum product they require directly, but separately, the centralization of such purchases in the hands of the State would enable the average cost of imported crude to be reduced.

In smaller countries, however, this concentration of purchasing may be insufficient to obtain the better prices secured by buyers of large volumes on account of their greater bargaining power. Consideratio

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8/ The potential benefits of these options do not extend to all the deficit countries of the region, for in many of them the domestic petroleum industry has no external component. Advantage could be taken of them, however, by several of the other Latin American deficit countries, especially in Central America and the Caribbean area.

/might therefore

might therefore be given to the possibility that a country whose capacity to import is limited, but is in the hands of the State, should make its purchases of petroleum in combination with those of one of the major importers of the region which also operates through State enterprises.

If the accounting price of crude in the local refinery affiliated to an international oil company is higher than the corresponding price in the world market sector where bargaining capacity is strongest, the government has the immediate possibility of eliminating the difference by legally establishing the price of petroleum in the world market sector where competition is keenest as the reference price that must be used for accounting purposes in respect of crude imported by the local refinery. At the same time, the refinery can be allowed to obtain a sufficient margin of profit to ensure a continuing supply of petroleum products in the domestic market. The application of this method might lessen the drain on foreign exchange under the head of petroleum imports and increase the tax contribution paid to the central government by a refinery affiliated to a foreign company, without necessarily disrupting the domestic market supply of petroleum products.

Several proposals have been put forward at the international level of late with a view to securing supplies of imported crude at a more favourable price: firstly, greater State participation in petroleum projects abroad; secondly, the conclusion of a world agreement between buyers and sellers of crude; and, thirdly, spot market bartering of petroleum for other products between exporter governments and the Latin American importer countries. These proposals are being explored and in some cases implemented by countries in the region.

Some Latin American deficit countries might find it in their interest to augment their external supplies of crude by starting petroleum activities of their own abroad, under agreements concluded with the host countries and acceptable to both parties.9/ Countries

9/ For example, in 1972 Brazil participated in petroleum activities in Colombia, Egypt, Iran, Irak and in that part of the North Sea which pertains to Norway.

/with less

with less technical or financial capacity, which would find it difficult to undertake such activities individually, might explore the possibility of entering into partnership with those that have larger resources at their disposal. It is highly unlikely, however, that investment in exploration activities abroad effected today will provide any financial relief to the deficit countries in the course of the present decade, and this option must therefore be regarded rather as a long-term prospect.

Crude oil transactions have never been governed by an official international commodity agreement, but there are some who believe it feasible to find grounds of compromise under the auspices of an international forum such as the United Nations. The stumbling-block to the adoption of such an agreement (which does not seem to be arousing much interest at the present time) is the establishment of an internationally acceptable price for the crude traded under its terms. The oil-deficit countries would benefit insofar as the price fixed were lower than the price to be expected if the agreement were not concluded, and would also gain some advantage inasmuch as the planning of their investment would be based on more stable price expectations, as regards not only petroleum, but also other products linked to it.

The petroleum-exporting countries, in their turn, might reap some benefit if the world price of crude established under the agreement were higher than the price they envisaged for the long-term, if the agreement were not concerted. If, however, they did not anticipate a drop in crude oil prices and assumed that current prices would be maintained, there would be little incentive for them to consider the possibility of signing an agreement of this kind.

The bartering of petroleum for other products on the spot market might be beneficial to some of the region's oil-deficit countries. Such barter agreements would be made directly between the governments concerned. They would have the effect of attracting more government crude into the world market, and therefore stepping

/up competition

up competition among the governments of the petroleum-exporting countries, on the one hand, and between them and the international oil companies on the other.

The Latin American oil-deficit countries are in a relatively favourable position for conducting negotiations of this type. They can probably establish with a measure of certainty the short-term prices of their export products, and, furthermore, can give the petroleum exporting countries the opportunity of adjusting prices or other terms for the sale of their crude within a much broader commercial framework, which may be in their interest. When longer periods of time are taken into consideration, the benefits of barter trade for the petroleum-importing countries become more and more dubious. Any estimate of future prices is surrounded by uncertainty, not only where petroleum is concerned, but also in respect of the goods imported in exchange for oil. The more this uncertainty increases, and the farther the arrangement departs from the normal pattern of international trade, the more questionable will its benefits become.

An idea that has recently been mooted at the international level is that of concentrating several countries' purchases of petroleum, as a mechanism to improve tha buyers bargaining position. This proposal has clearly not been well received in Latin America, and it is doubtful whether even the leading importer countries will back it.

## C. MINING SECTOR

### 1. Introduction

Although in Latin America as a whole the mining sector contributes less than 4 per cent to the gross domestic product, the figure is much higher in individual countries such as Guyana (17 per cnnt), Jamaica (12 per cent), Bolivia (10 per cent), Chile (8 per cent) and Peru (6 per cent).10/

The physical volume of the region's mining production has continued to grow in dollars at constant 1970 prices it rose from 2,200 million dollars in 1960 to 3,000 million in 1970 and 3,300 million in 1973. During the 1960s, the annual cumulative growth rate was 3.3 per cent, dropping to 2.7 per cent in the first three years of the 1970s.

Owing to the steady expansion of the mining sector in other regions of the world Latin America's share in the world supply of ores is declining in relative terms, although its known reserves and, above all, its potential resources suggest a different picture. An analysis of investment projects for the 1970s however, indicates that the situation is improving. Thus, whereas estimated accumulated net investment in the sector in 1970 11/ was between 3,000 and 3,500 million dollars, according to existing and planned projects, gross investment is expected to increase by about 6,600 million dollars in the 1970s; if this forecast proves true, the annual cumulative growth rate could be equal to, or perhaps higher than, that of the 1960s.

In the last decade, Latin America began to make important strides in the processing of its mineral products - a trend which has continued into the 1970s, with a consequent increase in the value added. Progress has been made in particular in the production of alumina and aluminium (bauxite), the smelting of tin, the production of ferronickel and the pelletization of iron ores. However, since the expansion of copper

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10/ This report does not include coal or hydrocarbons, which are dealt with in the section on the energy sector. The figures in brackets refer to the year 1972.

11/ Accumulation of investment over a period of time, allowance being made each year for depreciation of equipment and plants.

/smelting and

smelting and refining plants did not keep pace with the increase in production of ores, the proportion of the metal produced in blister and refined form declined.

For a group of countries, mining continues to be the main source of exports and a major factor in the expansion of domestic demand. Taking the region as a whole, the value of exports of the mining sector rose considerably in absolute terms, from 1,200 million dollars in 1961 to 2,800 million dollars in 1970 and 3,300 million dollars in 1973; their share of the region's total exports rose from 14.7 per cent in 1961 to 19 per cent in 1970, but dropped to a mere 13 per cent in 1973 as a result of the increase in the value of exports of other items (manufactured products and higher-priced petroleum).

The slowing down of the economic boom of Western countries towards the end of 1970 was reflected in a drop in the world prices of certain ores (copper, lead, tin), which continued up to the end of 1972. The trend was radically reversed at the beginning of 1973 when a series of increases pushed prices up to unprecedented levels around the second quarter of 1974. Since then, they have been declining steadily once again.

The growth of Latin America's mining sector depends largely on the state of world markets since, although local markets are expanding appreciably in Brazil, Mexico and Argentina, they are still small in terms of regional production.

Most countries in the area are hampered in their efforts to increase supply by the shortage of domestic financial resources and lack of experience in entrepreneurial organization. As a result, some countries encourage the participation of foreign capital and technology, in an appropriate legal and administrative framework.

In order to increase the sales price of their ores, Latin American countries have made serious efforts to increase the level of State participation in the marketing phase and to establish or strengthen producers' organizations in which governments take part (CIPEC for copper, IBA for bauxite). The possibility has also arisen of these organizations co-operating with OPEC.

/A major

A major change has taken place at the institutional level. During the period under consideration, the countries of the region have done much to assert their sovereignty over both their underground resources and levels of production by transferring decisions regarding their use from the private to the public sector. In some Latin American countries, this policy has given the State a more important role in the conservation of mineral reserves, nationalization and legal safeguards governing deposits. Examples of such action are the reform of mining legislation in Ecuador (1974) and Peru (1971), and the reform of the political constitution of Chile (1971) whereby the enterprises of the large-scale copper mining sector passed into the hands of the State.

In 1971, the Government of Guyana nationalized the Demerara Bauxite Company (DEMBA). In 1974, a bill was passed in Jamaica establishing a new procedure for the payment of royalties and taxes on the production of bauxite. In January 1975, the Venezuelan Government nationalized the plants of the iron mining enterprises.

## 2. Known reserves and mineral resources

Most Latin American countries do not have sufficient knowledge of their principal mineral resources and there is no general inventory of known resources in the region. However, since more research has been conducted into metalliferous ores with a view to their external marketing, the various countries do have some idea of their main reserves, especially those whose exploitation is of greater economic significance. As regards non-metallic ores on the other hand, estimates only exist of the reserves of a few deposits.

The lack of this kind of geological-economic data is due, among other things, to the weakness of the agencies responsible for geological and mining research, or their absence, and to the lack of uniform regional methodologies and nomenclatures for classifying reserves. Consequently, any attempt at a global estimate of mineral reserves in the region must be taken only as an indication of probable orders of magnitude.

/The most

The most important metalliferous ores for which estimates exist are bauxite, copper, tin, iron, manganese, molybdenum, silver, lead and zinc.

Table 13 contains a summary, by country, of information published on the reserves of certain natural ores. The amounts indicated were taken from various sources inside and outside the region, since in many cases estimates vary widely for the same product. As far as the desired conceptual homogeneity would allow, the figures which appeared most trustworthy were adopted. It must therefore be repeated that this summary of data is nothing more than an indication of probable orders of magnitude.

Existing knowledge of metalliferous resources in the region is more or less adequate only in a few countries, mainly those with a mining tradition such as Bolivia, Chile, Mexico and Peru; in other countries (Brazil, Venezuela, Argentina, etc.), there are vast tracts of land where, owing to lack of population, difficulty of access, density of vegetation, depth of soil, etc., information is minimal or non-existent. What information is available on mineral resources is the result of the efforts of prospectors, mining enterprises and specialized State agencies. From 1960 onwards, some progress was made through the mineral research projects conducted by State agencies with the assistance of the United Nations Development Programme (UNDP). Clearly, however, if present production capacity is to be maintained or increased, efficient geological and mining surveys of the region must be promoted, the first step being the modernization of legislation on the subject. It would also be desirable to build up a mining register and inventory of resources, employing, as far as possible, a uniform nomenclature.

### 3. Mining production

The global volume of Latin America's mining production has been steadily increasing throughout the past decade and in the first years of the 1970s (see table 14). In dollars at constant 1970 prices, the value of production amounted to 2,190 million dollars in 1960, 3,045 million in 1970 and 3,297 million in 1973. However, the production of certain minerals such as tin and silver declined slightly during the first three years of the 1970s.

/Table 13

Table 13

LATIN AMERICA: ESTIMATED RESERVES OF PRINCIPAL METAL ORES

(Fine content)a/

| Country | Proven and probables reserves | Approximate share of total world reserves (percentage) |
|---|---|---|
| | Bauxite (millions of tons) | |
| Jamaica | 600 | |
| Surinam | 200 | |
| Guyana | 80 | |
| Dominican Republic | 40 | |
| Brazil | 30 | |
| Haiti | 23 | |
| Latin America | 973 | 17.0 |
| | Copper (thousands of tons) | |
| Chile | 59 300 | |
| Peru | 24 600 | |
| Mexico | 680 | |
| Brazil | 420 | |
| Latin America | 85 000 | 25.0 |
| | Tin (thousands of tons) | |
| Bolivia | 500 | |
| Brazil | 100 | |
| Others | 5 | |
| Latin America | 605 | 16.0 |
| | Iron (millions of tons) | |
| Brazil | 30 050 | |
| Venezuela | 2 100 | |
| Peru | 1 025 | |
| Chile | 450 | |
| Colombia | 305 | |
| Argentina | 254 | |
| Bolivia b/ | (43 000) | |
| Others | 36 | |
| Latin America | 34 200 | 14.0 |
| | Manganese (thousands of tons) | |
| Brazil | 46 000 | |
| Mexico | 8 000 | |
| Chile | 1 200 | |
| Cuba | 800 | |
| Latin America | 56 000 | 8.0 |
| | Lead (thousands of tons) | |
| Mexico | 4 000 | |
| Peru | 1 400 | |
| Argentina | 1 200 | |
| Bolivia | 800 | |
| Brazil | 700 | |
| Latin America | 8 100 | 6.0 |
| | Zinc (thousands of tons) | |
| Mexico | 4 000 | |
| Peru | 2 000 | |
| Bolivia | 1 000 | |
| Others | 2 000 | |
| Latin America | 9 000 | 7.0 |

Source: ECLA, on the basis of various sources of information.

a/ Except for iron and manganese for which the figures refer to crude ore.

b/ This refers to the Mutun deposit, which has not yet been properly surveyed. A large part of its enormous volume is expected to be classified as a potential resource.

/Table 14

Table 14

LATIN AMERICA: PRODUCTION OF PRINCIPAL METALLIC ORES AND THEIR SHARE IN THE WORLD TOTAL

(Metal content)

| Metal | 1960 | | 1965 | | 1970 | | 1971 | | 1972 | | 1973 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Thousands of tons | Percentage share | Thousands of tons | Percentage share | Thousands of tons | Percentage share | Thousands of tons | Percentage share | Thousands of tons | Percentage share | Thousands of tons | Percentage share |
| Bauxite a/ | 12 577 | 46.3 | 17 570 | 47.3 | 24 659 | 41.8 | 25 801 | 39.9 | 25 811 | 38.5 | 26 587 | 37.0 |
| Copper | 795 | 19.2 | 864 | 17.5 | 1 000 | 15.9 | 1 008 | 16.1 | 1 045 | 15.2 | 1 047 | 14.3 |
| Tin b/ | 23 | 16.4 | 26 | 17.1 | 37 | 19.6 | 35 | 18.7 | 37 | 19.1 | 34 | 18.3 |
| Iron c/ | 42 303 | 7.2 | 60 476 | 11.0 | 82 337 | 10.8 | 87 032 | 11.3 | 83 521 | 11.1 | 104 064 | 13.1 |
| Nickel d/ | 11 | 3.6 | 18 | 4.5 | 35 | 6.0 | 36 | 6.2 | 36 | 6.4 | 36 | 6.3 |
| Silver e/ | 2 614 | 34.8 | 2 832 | 36.0 | 3 068 | 32.4 | 2 977 | 32.2 | 3 027 | 33.1 | 2 874 | 31.6 |
| Lead | 390 | 16.8 | 400 | 14.9 | 432 | 12.6 | 427 | 12.6 | 452 | 13.6 | 477 | 13.9 |
| Zinc | 507 | 15.6 | 541 | 13.3 | 681 | 13.1 | 781 | 13.6 | 755 | 14.0 | 819 | 14.9 |

Source: ECLA, on the basis of information drawn from the Yearbook of the American Bureau of Metal Statistics and from the Latin American Iron and Steel Institute (ILAFA).

Note: The world totals include a number of estimates, especially in the case of the Socialist countries.

a/ Dry ore.

b/ Not including the production of the Socialist countries.

c/ Refers to crude ore.

d/ Major producing countries.

e/ Tons.



/In the

In the second half of the 1960s, the increase in world production and consumption of the principle ores increased sharply, as can be seen from the annual cumulative growth rates of production (see table 15). This was partly attributable to the economic boom that took place in the industrialized countries and to an increase in the demand for certain strategic metals as a result of armed conflicts, particularly in South-East Asia. Unfortunately, the increase in mining production in Latin America for the most part fell behind that of other regions of the world, except in the case of nickel and tin. In the first years of the 1970s, as in the previous decade, the share of Latin America's mining sector in total world production declined, save in respect of iron, lead, zinc and nickel.

The more rapid increase in the mining production of other regions would seem to have been mainly due to the following factors:

(a) The diversion of the investment of industrialized countries towards other mining centres where they were able to obtain more attractive conditions (especially certain developed countries such as Australia, Canada, the United States and South Africa),12/ in addition to a tendency to diversify their interests and sources of supply geographically;

(b) The limited domestic financing and organizational capacity of the region, given the hazardous nature of mining at the exploratory stage and the large investments and advanced technology that are needed at the development and production stages;

(c) The increase in the mining production of other regions, particularly in the Socialist countries.

Furthermore, the trend of the world economy, which began to show signs of flagging towards the end of 1973, was unfavourable in 1974 when the price of fuels increased. World demand for minerals dropped substantially, particularly in the industrialized countries, and this affected both the volume and price of Latin American exports.

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12/ For example, the value of production of metallic ores in the United States was 5,159 million dollars in 1974 - an increase of 22 per cent over 1973.

/Table 15

Table 15

LATIN AMERICA AND THE WORLD: COMPARATIVE GROWTH RATE OF PRODUCTION OF SELECTED ORES

(Annual average growth rate)

| Period | Bauxite | | Copper | | Tin | | Nickel | | Silver | | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Latin America | World total | Latin America | World total | Latin America | World total | Latin America | World total | Latin America | World total | Latin America | World total | Latin America | World total |
| 1960-1970 | 7.0 | 8.1 | 2.3 | 4.3 | 4.9 | 3.0 | 12.0 | 6.5 | 1.6 | 2.3 | 1.0 | 3.9 | 3.0 | 4.8 |
| 1965-1970 | 7.0 | 9.7 | 3.0 | 4.9 | 6.7 | 3.8 | 13.9 | 7.6 | 1.6 | 3.7 | 1.5 | 4.9 | 4.7 | 5.1 |
| 1970-1971 | 4.6 | 9.5 | 0.0 | -0.5 | -4.6 | 0.2 | 3.1 | 0.2 | -3.0 | -2.3 | -1.2 | -0.8 | 14.7 | 0.0 |
| 1970-1972 | 2.3 | 2.2 | 2.2 | 4.3 | 1.2 | 5.4 | 1.5 | -1.4 | -0.7 | -1.7 | 2.3 | 0.3 | 5.3 | 1.7 |
| 1970-1973 | 2.6 | 6.8 | 1.6 | 5.1 | -2.3 | 0.0 | 1.0 | -0.6 | -2.1 | -1.2 | 3.4 | 0.2 | 6.4 | 1.7 |

Source: ECLA, on the basis of various sources of information.

a/ Not including the Socialist countries.



/Table 16

Table 16 shows the share of ores in the value of Latin America's mining production. Eight ores contribute more than 90 per cent of the total value of production of the mining sector (at constant 1970 prices). By far the most important of these is copper.

The production of certain ores tends to be concentrated in particular countries or groups of countries (see table 17). In 1973, in terms of total volume of Latin America's production, Chile, Peru and Mexico produced 97.9 per cent of copper; Brazil, Venezuela, Peru and Chile 93.6 per cent of iron; Jamaica, Surinam and Guyana 90.8 per cent of bauxite; Peru and Mexico 79.2 per cent of lead, 83.6 per cent of zinc and 83.5 per cent of silver; Cuba and the Dominican Republic almost the entire production of nickel; Bolivia 83.8 per cent of tin; Peru, Mexico and Bolivia almost the total output of bismuth, etc.

Table 18 contains indexes of the volume of production of the principal producing countries. In Brazil, Surinam and Jamaica, the growth of production was above the regional average in 1970-1973, mainly owing to the increase in production of iron in Brazil and of bauxite in Surinam and Jamaica.

According to provisional information for 1973, the annual average growth rate was 2.7 per cent in the first three years of the 1970s, compared with 3.3 per cent in the 1960s and 3.6 per cent in the period 1966-1970.

## 4. Mining exports

The mining sector plays a major role in the foreign trade and balance of payments of several Latin American countries. In the so-called mining countries (Bolivia, Chile and Peru), the sector's share of total exports is fairly high - over 80 per cent in the first two cases and nearly 50 per cent in the third. Bauxite-producing countries such as Surinam, Guyana and Jamaica are in a similar situation (see table 19).

/Table 16

Table 16

LATIN AMERICA: SHARE OF PRINCIPAL ORES IN THE VALUE OF MINING PRODUCTION a/

(Percentages)

| | 1960 | 1965 | 1970 | 1973 |
|---|---|---|---|---|
| Copper | 50.7 | 47.2 | 45.5 | 44.9 |
| Iron | 8.0 | 10.3 | 11.2 | 11.5 |
| Zinc | 6.1 | 6.1 | 6.6 | 7.0 |
| Bauxite | 6.4 | 7.7 | 9.0 | 9.0 |
| Silver | 8.0 | 6.9 | 6.3 | 5.8 |
| Nickel | 1.8 | 3.5 | 4.0 | 5.8 |
| Lead | 5.3 | 4.7 | 4.2 | 4.2 |
| Tin | 3.6 | 3.9 | 4.1 | 3.7 |
| Others | 10.1 | 9.6 | 9.1 | 8.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

Source: ECLA, on the basis of various sources of information.
a/ Based on average constant 1970 prices.

/Table 17

Table 17

LATIN AMERICA: PRODUCTION OF PRINCIPAL ORES BY COUNTRY

(Thousands of tons of metal content)

| Ore | Year | Argentina | Bolivia a/ | Brazil | Chile | Guyana | Jamaica | Mexico | Peru | Surinam | Venezuela | Others | Latin America |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bauxite | 1960 | - | - | 120.7 | - | 2 141.2 | 5 871.9 | - | - | 3 454.9 | - | 988.2 | 12 577.0 |
| | 1970 | - | - | 390.1 | - | 4 417.2 | 12 105.9 | - | - | 6 021.9 | - | 1 723.9 b/ | 24 659.1 |
| | 1973 | - | - | 498.9 | - | 3 719.4 | 13 485.5 | - | - | 6 943.7 | - | 1 935.9 b/ | 26 587.5 |
| Copper | 1960 | - | 2.3 | 1.1 | 532.2 | - | - | 60.3 | 181.7 | - | - | 17.6 | 795.2 |
| | 1970 | - | 8.8 | 3.7 | 691.6 | - | - | 61.0 | 220.2 | - | - | 15.0 | 1 000.5 |
| | 1973 | - | 8.2 | 6.0 | 725.9 | - | - | 80.5 | 218.8 | - | - | 7.7 | 1 047.1 |
| Tin | 1960 | 0.2 | 20.5 | 1.6 | - | - | - | 0.4 | - | - | - | - | 22.7 |
| | 1970 | 2.3 | 30.1 | 3.6 | - | - | - | 0.5 | - | - | - | - | 36.5 |
| | 1973 | 2.0 | 28.6 | 3.2 | - | - | - | 0.3 | - | - | - | - | 34.1 |
| Iron c/ | 1960 | 0.1 | - | 9 345.0 | 6 041.0 | - | - | 939.0 | 5 701.0 | - | 19 490.0 | 0.6 | 42 303.0 |
| | 1970 | 0.2 | - | 34 758.0 | 11 265.0 | - | - | 4 045.0 | 9 713.0 | - | 21 864.0 | 0.4 | 82 337.0 |
| | 1973 | 0.3 | - | 56 000.0 | 9 650.0 | - | - | 5 736.0 | 8 964.0 | - | 22 880.0 | 0.5 | 104 064.0 |
| Silver d/ | 1960 | 52.0 | 152.0 | 7.8 | 52.2 | - | - | 1 384.9 | 956.6 | - | - | 8.1 | 2 613.7 |
| | 1970 | 63.8 | 212.0 | 11.1 | 74.4 | - | - | 1 332.4 | 1 239.0 | - | - | 135.3 | 3 068.0 |
| | 1973 | 56.0 | 164.3 | 14.6 | 115.1 | - | - | 1 206.4 | 1 194.4 | - | - | 124.1 | 2 874.9 |
| Lead | 1960 | 23.6 | 21.4 | 9.8 | 2.4 | - | - | 190.7 | 131.6 | - | - | 10.7 | 390.3 |
| | 1970 | 38.0 | 25.7 | 18.1 | 0.9 | - | - | 176.6 | 156.8 | - | - | 15.6 | 431.8 |
| | 1973 | 36.0 | 20.1 | 24.0 | 0.6 | - | - | 179.3 | 198.5 | - | - | 18.6 | 477.3 |
| Zinc | 1960 | 28.6 | 4.0 | 5.2 | - | - | - | 271.4 | 178.1 | - | - | 14.3 | 496.5 |
| | 1970 | 39.0 | 46.5 | 15.3 | - | - | - | 266.4 | 299.1 | - | - | 16.9 | 680.6 |
| | 1973 | 40.7 | 48.8 | 24.6 | - | - | - | 271.4 | 413.7 | - | - | 19.9 | 819.2 |

Source: ECLA, on the basis of information drawn from the Yearbook of the American Bureau of Metal Statistics and from ILAFA.

a/ Exports.

b/ Approximately 40 per cent corresponds to Haiti and 60 per cent to the Dominican Republic.

c/ Crude ore.

d/ Tons.



/Table 18

Table 18

LATIN AMERICA: INDEXES OF PHYSICAL VOLUME OF GROSS MINING PRODUCTION

(1970 = 100)

| Country | 1960-1970 | 1966-1970 | 1970 | 1971 | 1972 | 1973 |
|---|---|---|---|---|---|---|
| Argentina | 75.53 | 83.26 | 100.00 | 103.67 | 104.67 | 91.07a/ |
| Bolivia | 82.41 | 94.56 | 100.00 | 103.51 | 103.78 | 105.29 |
| Brazil | 66.44 | 83.55 | 100.00 | 128.68 | 128.68 | 125.57a/ |
| Colombia | 103.62 | 103.31 | 100.00 | 102.47 | 106.53 | 107.62a/ |
| Chile | 92.36 | 96.96 | 100.00 | 102.85 | 102.15 | 104.42 |
| Guyana | 69.23 | 87.17 | 100.00 | 95.60 | 84.40 | 84.22 |
| Jamaica | 72.35 | 82.01 | 100.00 | 103.61 | 107.29 | 111.43 |
| Mexico | 92.99 | 95.74 | 100.00 | 96.93 | 99.36 | 106.78a/ |
| Peru | 86.22 | 92.81 | 100.00 | 96.83 | 106.82a/ | 108.62a/ |
| Surinam | 79.18 | 96.29 | 100.00 | 111.52 | 112.50 | 112.25 |
| Venezuela | 75.13 | 83.50 | 100.00 | 89.03 | 79.03 | 97.13a/ |
| Total b/ | 86.05 | 93.51 | 100.00 | 102.42 | 106.12 | 108.97 |

Source: ECLA, on the basis of official information supplied by the countries.

a/ Provisional figures.

b/ The total refers to Latin America, including the countries not listed.

/Table 19

Table 19

LATIN AMERICA: FOB VALUE OF MINING EXPORTS (EXCLUDING HYDROCARBONS) AND SHARE OF THE MINING SECTOR IN THE TOTAL EXPORTS OF EACH COUNTRY

(Millions of dollars)

| Country | 1961 | | 1970 | | 1972 | | 1973 | |
|---|---|---|---|---|---|---|---|---|
| | Mining exports | Percentage share | Mining exports | Percentage share | Mining exports | Percentage share | Mining exports | Percentage share |
| Argentina | 6.0 | 0.6 | 5.4 | 0.3 | 6.4 | 0.3 | 4.0 | 0.1 |
| Bolivia | 58.4 | 94.3 | 204.7 | 90.7 | 174.1 | 86.1 | 225.2 | 81.9 |
| Brazil | 101.5 | 7.2 | 270.4 | 9.7 | 282.2 | 7.1 | 399.2 | 6.4 |
| Chile | 440.3 | 86.7 | 1 077.6 | 86.3 | 718.0 | 82.0 | 1 190.6 | 91.1 |
| Guyana | 40.5 | 27.3 | 69.5 | 53.1 | 64.3 | 43.8 | (65.0) | 43.9 |
| Jamaica | 30.2 | 49.8 | 156.3 | 46.9 | 153.0 | 41.5 | (170.0) | 43.5 |
| Mexico | 140.2 | 17.1 | 229.5 | 16.4 | 251.5 | 13.4 | 258.3 | 10.6 |
| Peru | 217.7 | 44.3 | 504.4 | 48.1 | 434.4 | 46.0 | 627.0 | 59.7 |
| Dominican Republic | 12.2 | 8.6 | 15.1 | 7.1 | 61.9 | 17.8 | 98.3 | 22.2 |
| Surinam | 34.2 | 83.5 | 91.4 | 68.2 | 104.2 | 62.7 | 108.0 | 57.7 |
| Venezuela | 123.6 | 5.0 | 199.1 | 7.2 | 128.3 | 3.4 | 162.1 | 2.9 |
| Others | 8.1 | ... | 15.2 | ... | 12.8 | ... | ... | (11.9) |
| Total | 1 213.0 | 14.7 | 2 838.2 | 19.0 | 2 391.1 | 13.1 | (3 318.8) | 13.0 |

Source: ECLA, on the basis of official information.

/The total

The total value of the region's mining exports rose from 1,213 million dollars in 1961 to 2,838.2 million dollars in 1970 (an annual cumulative increase of 8.9 per cent). All the countries increased their mining exports considerably during this period. The annual cumulative growth rate was about 18 per cent in Jamaica, 14 per cent in Bolivia, 10 per cent in Brazil, Chile and Surinam, and 9 per cent in Peru. Important factors in such exceptional increases were the rise in world metal prices and the expansion of the world market, especially for bauxite and iron ore, which encouraged an increase in mining production throughout the world and elicited a response in certain Latin American countries.

The increase in the share of the mining sector in the total value of Latin American exports was also substantial, rising from 14.7 in 1961 to 19.0 per cent in 1970. In the first three years of the 1970s, the trend of mining exports was less favourable, as they dropped 447 million dollars in value between 1970 and 1972, owing to a decrease in the volume of production or in the smelting or refining of ores and temporary reductions in world prices. The countries most affected were Chile, Peru, Venezuela and Bolivia. Exports recovered in 1973, when they reached 3,319 million dollars in value, 480 million dollars more than in 1970. In spite of this, the share of mining exports in the total for these two years was only 13 per cent, a reflection of the increase in exports of other items, particularly manufactured products and petroleum (which benefited from a higher unit value).

The region's mining exports went mostly to Western Europe, the United States and Japan. The United States is the largest market for the exports of Mexico, Venezuela, and the principal bauxite-producing countries. Almost 15 per cent of the latter's total exports go to Canada, Western Europe and Japan take most of the mining exports of Chile and Brazil. Peru's exports are shared more or less equally among three principal markets. Finally, 85 per cent of Bolivia's tin goes to Western Europe (see table 20).

## 5. Domestic consumption

Most of the production of the traditionally mining countries and that of the major producers of bauxite and iron ore goes to countries outside Latin America.

/Table 20

Table 20

LATIN AMERICA: DESTINATION OF PRINCIPAL EXPORTS OF ORE, 1972

(Percentage distribution of ore exports of each country)

| | Western Europe | United States | Japan | Latin America | Others |
|---|---|---|---|---|---|
| Copper | | | | | |
| Chile | 70 | 14 | 10 | 6 | - |
| Peru | 27 | 51 | 17 | - | 5 |
| Lead | | | | | |
| Mexico | 18a/ | 67 | - | 8 | 7 |
| Peru | 30a/ | 45 | 8 | - | 17 |
| Zinc b/ | | | | | |
| Mexico | 1a/ | 25 | - | 44 | 30 |
| Peru | 21a/ | 22 | 46 | - | 11 |
| Iron ore | | | | | |
| Brazil | 64 | 6 | 25 | 3 | 2 |
| Venezuela | 35 | 62 | - | - | 3 |
| Chile | 10 | 6 | 84 | - | - |
| Peru | 7 | 13 | 79 | - | 1 |
| Bauxite c/ | | | | | |
| Jamaica | - | 100 | - | - | - |
| Surinam | 7 | 87 | 6 | - | - |
| Guyana | 13 | 72 | 7 | - | 8 |
| Tin | | | | | |
| Bolivia | 85 | 12 | - | - | 3 |

Source: ECLA, on the basis of various sources of information.

a/ European Common Market only; other western European countries are included under "others".

b/ Refers to metallic zinc.

c/ The figures for the United States include exports to Canada.

/Only a

Only a few metals are consumed on a fairly large scale in the region; for example, in 1973, about 45 per cent of Latin America's total production of lead, 27 per cent of that of zinc and 21 per cent of that of copper and tin were consumed in the region. By contrast, Latin America's consumption of aluminium is greater than the region's production (see table 21), although it represents only about 4 per cent of the corresponding metal content of the bauxite produced.

Most of the region's consumption of these metals is concentrated in the relatively more developed countries, such as Argentina, Brazil and Mexico. Out of the total production of 104 million tons of iron ore, about 18 million tons (or 17.3 per cent) were used in the region in 1973 as an input for the iron and steel industry.

6. Extent of vertical integration in the mining sector

On the whole, major strides were made in the 1960s in the regional processing of metallic ores. Owing to the increase in the production of ores and a number of local problems in the extractive metallurgy industry, there was a slight drop in the proportion of blister and refined copper in the three major producing countries during the first three years of the 1970s.13/ In Chile, thanks to the considerable progress made in the 1960s, metallurgically processed copper represented 94.4 per cent of the metal produced in 1970, dropping to 80.2 per cent in 1973. Something similar occurred in Mexico, where the proportion of blister and refined copper reached 97.7 per cent in 1970 but dropped to 84.5 per cent in 1973, and in Peru, where it fell from 83.2 per cent in 1970 to 79.1 per cent in 1973 (see table 22).

These figures indicate that the installed capacity of the smelting and refining plants was being fully utilized or else that temporary bottlenecks had occurred in one of the metallurgical processes. New investment in these countries will no doubt soon bring an increase in the value added of copper. Chile, for example, will soon be replacing certain air furnaces and convertors whose efficiency has deteriorated.

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13/ In absolute and relative terms, the volume of exports of ores and concentrates rose considerably.

/Table 21

Table 21

LATIN AMERICA: PRODUCTION AND CONSUMPTION OF SELECTED METALS IN THE PRINCIPAL MINING COUNTRIES

(Metal content in thousands of tons)

| Country | Year | Aluminium | | Copper | | Tin | | Lead | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Production | Consumption | Production | Consumption | Production | Consumption | Production | Consumption | Production | Consumption |
| Argentina | 1961 | - | 18.0 | - | 25.5 | 0.3 | 2.0 | 26.9 | 27.0 | 32.2 | 19.0 |
| | 1965 | - | 36.3 | - | 23.2 | 0.5 | 1.4 | 30.6 | 38.8 | 29.7 | 27.0 |
| | 1970 | - | 50.7 | - | 29.0 | 2.3 | 1.8 | 38.0 | 42.0 | 38.9 | 34.0 |
| | 1971 | - | 59.3 | - | 34.2 | 2.0 | 1.8 | 39.0 | 44.0 | 44.5 | 34.0 |
| | 1972 | - | 60.0 | - | 34.6 | 1.9 | 1.8 | 37.3 | 42.0 | 43.8 | 34.0 |
| | 1973 | - | 65.0 | - | 37.8 | 2.0 | 1.8 | 36.0 | 45.0 | 40.7 | 30.0 |
| Bolivia | 1961 | - | ... | 2.1 | ... | 20.7 | ... | 20.3 | ... | 5.3 | ... |
| | 1965 | - | ... | 4.7 | ... | 24.2 | ... | 17.5 | ... | 13.7 | ... |
| | 1970 | - | ... | 8.8 | ... | 30.1 | ... | 25.8 | ... | 46.5 | ... |
| | 1971 | - | ... | 8.1 | ... | 30.3 | ... | 23.3 | ... | 45.4 | ... |
| | 1972 | - | ... | 8.4 | ... | 32.4 | ... | 19.2 | ... | 39.7 | ... |
| | 1973 | - | ... | 8.2 | ... | 28.6 | ... | 20.1 | ... | 48.8 | ... |
| Brazil | 1961 | 18.5 | 36.8 | 2.0 | 36.4 | 1.5 | 1.6 | 12.7 | 26.2 | - | 32.7 |
| | 1965 | 30.4 | 51.6 | 3.0 | 30.7 | 1.7 | 1.8 | 24.0 | 17.5 | 0.1 | 31.6 |
| | 1970 | 56.1 | 90.0 | 4.2 | 57.9 | 3.2 | 2.2 | 20.3 | 20.9 | 11.0 | 49.1 |
| | 1971 | 80.6 | 106.6 | 4.4 | 78.2 | 3.5 | 2.3 | 22.8 | 34.0 | 15.3 | 60.1 |
| | 1972 | 97.3 | 142.8 | 5.0 | 90.4 | 3.8 | 2.3 | 23.7 | 33.0 | 17.8 | 65.6 |
| | 1973 | 97.8 | 160.0 | 6.0 | 97.7 | 4.3 | 2.5 | 24.0 | 50.8 | 24.6 | 80.0 |
| Chile | 1961 | - | ... | 547.4 | 6.2 | - | 0.2 | 2.0 | ... | - | 5.0 |
| | 1965 | - | ... | 585.3 | 10.7 | - | 0.6 | 0.8 | ... | - | 6.5 |
| | 1970 | - | ... | 601.6 | 11.8 | - | 0.6 | 0.9 | ... | - | 3.8 |
| | 1971 | - | ... | 708.3 | 15.9 | - | 0.8 | 0.9 | ... | - | 6.0 |
| | 1972 | - | ... | 716.8 | 19.6 | - | 0.7 | 0.6 | ... | - | 5.9 |
| | 1973 | - | ... | 725.9 | 18.3 | - | 0.7 | 0.6 | ... | - | 5.0 |
| Mexico | 1961 | - | 10.5 | 49.3 | 19.6 | 0.2 | 1.2 | 190.0 | 37.6 | 269.0 | 21.6 |
| | 1965 | 19.2 | 20.0 | 69.2 | 36.1 | 0.5 | 1.7 | 170.1 | 71.0 | 224.9 | 38.7 |
| | 1970 | 34.0 | 36.0 | 61.0 | 54.0 | 0.5 | 1.3 | 176.6 | 94.3 | 266.4 | 47.8 |
| | 1971 | 39.9 | 40.0 | 63.2 | 60.0 | 0.5 | 2.8 | 156.8 | 93.2 | 265.0 | 42.4 |
| | 1972 | 39.5 | 40.0 | 78.7 | 64.0 | 0.4 | 1.6 | 161.4 | 92.0 | 271.8 | 48.8 |
| | 1973 | 39.2 | 51.9 | 80.5 | 66.0 | 0.3 | 1.6 | 179.3 | 99.6 | 271.4 | 50.0 |
| Peru | 1961 | - | ... | 198.0 | 1.0 | - | ... | 136.9 | ... | 170.8 | 1.2 |
| | 1965 | - | ... | 180.3 | 2.0 | - | ... | 154.3 | 3.0 | 254.5 | 4.3 |
| | 1970 | - | ... | 220.2 | 3.5 | - | ... | 156.8 | 5.0 | 299.1 | 5.0 |
| | 1971 | - | ... | 207.3 | 4.7 | - | ... | 165.8 | 4.5 | 318.1 | 4.1 |
| | 1972 | - | ... | 225.0 | 6.0 | - | ... | 189.0 | 5.4 | 357.6 | 4.5 |
| | 1973 | - | ... | 218.8 | 6.0 | - | ... | 198.6 | 7.5 | 413.7 | 33.4 |
| Venezuela | 1961 | - | ... | - | ... | - | ... | - | ... | - | ... |
| | 1965 | - | 3.0 | - | ... | - | 0.2 | - | ... | - | 4.1 |
| | 1970 | 22.9 | 9.9 | - | ... | - | 0.2 | - | ... | - | 8.7 |
| | 1971 | 22.4 | 11.9 | - | ... | - | 0.2 | - | ... | - | 8.6 |
| | 1972 | 23.3 | 13.1 | - | ... | - | 0.2 | - | ... | - | 10.6 |
| | 1973 | 50.0 | 18.0 | - | ... | - | 0.2 | - | ... | - | 10.2 |
| Latin America | 1961 | 18.5 | 85.3 | 813.3 | 89.7 | 22.7 | 5.9 | 388.8 | 100.1 | 492.9 | 80.3 |
| | 1965 | 53.1 | 120.6 | 864.1 | 104.7 | 26.4 | 5.7 | 400.0 | 138.8 | 541.1 | 112.1 |
| | 1970 | 167.9 | 206.1 | 1 000.5 | 158.7 | 36.6 | 6.7 | 431.8 | 170.8 | 680.6 | 162.0 |
| | 1971 | 190.6 | 244.5 | 1 008.4 | 196.0 | 34.9 | 7.1 | 426.7 | 189.2 | 780.7 | 173.8 |
| | 1972 | 212.7 | 286.0 | 1 044.7 | 217.6 | 37.5 | 7.1 | 451.9 | 189.1 | 755.0 | 193.4 |
| | 1973 | 241.2 | 326.9 | 1 047.1 | 223.8 | 34.1 | 7.3 | 477.3 | 217.8 | 819.2 | 221.3 |

Source: ECLA, on the basis of the Yearbook of the American Bureau of Metal Statistics, World Metal Statistics, Metallgesellschaft Aktiengesellschaft, American Metal Market, Metal Statistics, and CODELCO, Boletín Estadístico Anual (Chile).

/Table 22

Table 22

LATIN AMERICA: PRODUCTION OF SELECTED ORES ACCORDING TO DEGREE OF PROCESSING

(Metal content in thousands of tons)

| | 1960 | | 1965 | | 1970 | | 1971 | | 1972 | | 1973 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage |
| **Copper** | | | | | | | | | | | | |
| Chile | | | | | | | | | | | | |
| Ores and concentrates [a] | 27.3 | 5.1 | 27.8 | 4.7 | 38.4 | 5.6 | 89.3 | 12.6 | 86.2 | 12.0 | 145.5 | 19.8 |
| Blister copper | 279.2 | 52.5 | 268.7 | 46.0 | 242.7 | 35.4 | 220.5 | 31.1 | 169.2 | 23.6 | 175.1 | 23.8 |
| Refined copper | 225.6 | 42.3 | 288.8 | 49.3 | 404.5 | 59.0 | 398.5 | 56.3 | 461.4 | 64.4 | 414.8 | 56.4 |
| Total | 532.1 | 100.0 | 585.3 | 100.0 | 685.6 | 100.0 | 708.3 | 100.0 | 716.8 | 100.0 | 735.4 | 100.0 |
| Mexico | | | | | | | | | | | | |
| Ores and concentrates | 8.6 | 14.3 | 8.0 | 14.6 | 1.4 | 2.3 | 3.5 | 5.5 | 6.4 | 8.1 | 12.5 | 15.5 |
| Blister copper | 23.5 | 39.0 | 0.8 | 1.4 | 5.9 | 9.7 | - | - | 8.3 | 10.5 | 6.1 | 7.6 |
| Refined copper | 28.2 | 46.7 | 46.4 | 84.0 | 53.7 | 88.0 | 59.7 | 94.5 | 64.0 | 81.4 | 61.9 | 76.9 |
| Total | 60.3 | 100.0 | 55.2 | 100.0 | 61.0 | 100.0 | 63.2 | 100.0 | 78.7 | 100.0 | 80.5 | 100.0 |
| Peru | | | | | | | | | | | | |
| Ores and concentrates [a] | 20.5 | 11.1 | 21.7 | 12.0 | 35.7 | 16.8 | 40.9 | 19.7 | 49.8 | 22.1 | 45.8 | 20.9 |
| Blister copper | 133.6 | 72.6 | 118.1 | 65.5 | 140.2 | 66.1 | 133.8 | 64.6 | 136.0 | 60.4 | 134.0 | 61.3 |
| Refined copper | 29.9 | 16.3 | 40.5 | 22.2 | 36.2 | 17.1 | 32.6 | 15.7 | 39.2 | 17.5 | 39.0 | 17.8 |
| Total | 184.0 | 100.0 | 180.3 | 100.0 | 212.1 | 100.0 | 207.3 | 100.0 | 225.0 | 100.0 | 218.8 | 100.0 |
| **Tin** | | | | | | | | | | | | |
| Bolivia | | | | | | | | | | | | |
| Ores and concentrates [a] | 19.4 | 94.6 | 19.9 | 85.0 | 29.4 | 97.7 | 23.5 | 77.6 | 25.9 | 79.9 | 21.6 | 75.5 |
| Smelted tin | 1.1 | 5.4 | 3.5 | 15.0 | 0.7 | 2.3 | 6.8 | 22.4 | 6.5 | 20.1 | 7.0 | 24.5 |
| Total | 20.5 | 100.0 | 23.4 | 100.0 | 30.1 | 100.0 | 30.3 | 100.0 | 32.4 | 100.0 | 28.6 | 100.0 |
| **Lead** | | | | | | | | | | | | |
| Argentina | | | | | | | | | | | | |
| Ores and concentrates | - | - | - | - | - | - | - | - | - | - | - | - |
| Smelted lead [b] | 29.4 | 100.0 | 38.8 | 100.0 | 40.0 | 100.0 | 43.5 | 100.0 | 39.5 | 100.0 | 37.8 | 100.0 |
| Total | 29.4 | 100.0 | 38.8 | 100.0 | 40.0 | 100.0 | 43.5 | 100.0 | 39.5 | 100.0 | 37.8 | 100.0 |
| Bolivia | | | | | | | | | | | | |
| Ores and concentrates [a] | 21.3 | 100.0 | 17.5 | 100.0 | 25.8 | 100.0 | 23.3 | 100.0 | 19.2 | 100.0 | 20.1 | 100.0 |
| Smelted lead | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 21.3 | 100.0 | 17.5 | 100.0 | 25.8 | 100.0 | 23.3 | 100.0 | 19.2 | 100.0 | 20.1 | 100.0 |
| Brazil | | | | | | | | | | | | |
| Ores and concentrates | - | - | 14.5 | 60.4 | 0.8 | 4.0 | - | - | - | - | - | - |
| Smelted lead [b] | 9.8 | 100.0 | 9.5 | 39.6 | 19.5 | 96.0 | 22.8 | 100.0 | 23.7 | 100.0 | 24.0 | 100.0 |
| Total | 9.8 | 100.0 | 24.0 | 100.0 | 20.3 | 100.0 | 22.8 | 100.0 | 23.7 | 100.0 | 24.0 | 100.0 |
| Mexico | | | | | | | | | | | | |
| Ores and concentrates | 24.0 | 12.6 | - | - | - | - | - | - | 1.1 | 0.7 | - | - |
| Smelted lead | 166.7 | 87.4 | 172.4 | 100.0 | 180.3 | 100.0 | 158.8 | 100.0 | 160.3 | 99.3 | 188.9 | 100.0 |
| Total | 190.7 | 100.0 | 172.4 | 100.0 | 180.3 | 100.0 | 158.8 | 100.0 | 161.4 | 100.0 | 188.9 | 100.0 |

LATIN AMERICA: PRODUCTION OF SELECTED . . . (concluded)

| | 1960 | | 1965 | | 1970 | | 1971 | | 1972 | | 1973 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage | Volume | Percentage |
| Peru | | | | | | | | | | | | |
| Ores and concentrates a/ | 57.1 | 43.5 | 67.5 | 43.7 | 82.8 | 53.4 | 98.3 | 59.3 | 103.0 | 54.5 | 115.3 | 58.0 |
| Smelted lead | 74.1 | 56.5 | 86.6 | 56.3 | 72.2 | 46.6 | 67.5 | 40.7 | 86.0 | 45.5 | 83.3 | 42.0 |
| Total | 131.2 | 100.0 | 154.3 | 100.0 | 155.0 | 100.0 | 165.8 | 100.0 | 189.0 | 100.0 | 198.6 | 100.0 |
| Zinc | | | | | | | | | | | | |
| Argentina | | | | | | | | | | | | |
| Ores and concentrates | 19.4 | 54.8 | 6.1 | 20.5 | 10.2 | 26.2 | 3.7 | 8.3 | 2.6 | 6.0 | 5.0 | 12.3 |
| Slabs | 16.0 | 45.2 | 23.6 | 79.5 | 28.7 | 73.8 | 40.8 | 91.7 | 40.8 | 94.0 | 35.7 | 87.7 |
| Total | 35.4 | 100.0 | 29.7 | 100.0 | 38.9 | 100.0 | 44.5 | 100.0 | 43.4 | 100.0 | 40.7 | 100.0 |
| Bolivia | | | | | | | | | | | | |
| Ores and concentrates a/ | 4.0 | 100.0 | 13.4 | 100.0 | 46.5 | 100.0 | 45.4 | 100.0 | 39.7 | 100.0 | 48.8 | 100.0 |
| Slabs | - | - | - | - | - | - | - | - | - | - | - | - |
| Total | 4.0 | 100.0 | 13.4 | 100.0 | 46.5 | 100.0 | 45.4 | 100.0 | 39.7 | 100.0 | 48.8 | 100.0 |
| Brazil | | | | | | | | | | | | |
| Ores and concentrates | ... | - | - | - | 0.5 | 4.5 | 2.0 | 13.1 | 1.6 | 9.0 | 2.3 | 9.9 |
| Slabs | ... | - | 0.1 | 100.0 | 10.5 | 95.5 | 13.3 | 86.9 | 16.2 | 91.2 | 22.3 | 90.7 |
| Total | ... | - | 0.1 | 100.0 | 11.0 | 100.0 | 15.3 | 100.0 | 17.8 | 100.0 | 24.6 | 100.0 |
| Mexico | | | | | | | | | | | | |
| Ores and concentrates | 418.5 | 80.5 | 162.2 | 72.1 | 181.8 | 68.2 | 176.3 | 66.5 | 184.4 | 67.8 | 197.9 | 72.9 |
| Slabs | 52.9 | 19.5 | 62.7 | 27.9 | 84.6 | 31.8 | 88.7 | 33.5 | 87.4 | 32.2 | 73.5 | 27.1 |
| Total | 271.4 | 100.0 | 224.9 | 100.0 | 266.4 | 100.0 | 265.0 | 100.0 | 271.8 | 100.0 | 271.4 | 100.0 |
| Peru | | | | | | | | | | | | |
| Ores and concentrates a/ | 124.9 | 79.4 | 193.2 | 75.9 | 230.4 | 77.0 | 260.7 | 82.0 | 290.4 | 81.2 | 346.2 | 83.7 |
| Slabs | 32.4 | 20.6 | 61.3 | 24.1 | 68.7 | 23.0 | 57.4 | 18.0 | 67.2 | 18.8 | 67.5 | 16.3 |
| Total | 157.3 | 100.0 | 254.5 | 100.0 | 299.1 | 100.0 | 318.1 | 100.0 | 357.6 | 100.0 | 413.7 | 100.0 |

Source: ECLA, on the basis of Metallgesellschaft Aktiengesellschaft.

a/ Exports

b/ Including secondary recovery.

/The production

The production is also being contemplated of copper wire rod for export, by means of a continuous-casting process with direct fusion of cathodes (without passing through the wire-bars stage), and this would further increase the value added. In Mexico, the working of the Caridad deposit, which includes a smelting and refining plant, and the enlargement of the Cananea mine will increase the degree of processing of copper ore. In Peru, the situation will tend to improve during the 1970s, since the entire production of concentrates from the new Cuajones mine will be processed in the enlarged Ilo foundry. With the financial assistance of a Japanese mining group, the State enterprise MINEROPERU will be setting up a refinery in the same location with an annual capacity of 125 to 150 thousands tons of electrolytic copper.

In 1973, Bolivia refined 24.5 per cent of its production of tin, compared with 2.3 per cent in 1970. Over the next few years, the existing Vinto refinery which began operating in 1971, will be enlarged so as to refine about 50 per cent of the country's total production.

The entire production of lead ores in Mexico, Argentina and Brazil is processed into metallic lead. The output of Argentina and Brazil all goes to the domestic market, while in Mexico, because of the large volume of production, only slightly over half is for domestic consumption. Peru, the biggest producer of lead ore in Latin America in recent years, smelts about 42 per cent of its total production, while Bolivia exports its entire production in the form of concentrates.

Of the group of metals considered here, zinc receives the least processing. The two largest producers in the region, Peru and Mexico, turned about 17 and 30 per cent respectively of their production into metallic zinc in the first three years of the 1970s. The situation improved ostensibly in 1974, when an electrolytic refinery began operating with an annual capacity of 105,000 tons of high grade metal, thereby reversing the ratio of metallic zinc to ores and concetrates.

/Smaller producers

Smaller producers of zinc, such as Argentina and Brazil, increased their output of seals during the first years of the 1970s. By contrast, Bolivia continues to export only concentrates.

Much of the raw materials required for the manufacture of aluminium is exported by Latin America in the form of calcined bauxite and the remainder as alumina derived from the smelting of the former. In recent years, there has been a considerable increase in the production of alumina (see table 23). Of the three main bauxite-producing countries, Surinam turned 50 per cent of its production into alumina in 1973, Jamaica 46 per cent and Guyana 18 per cent, compared with 43 per cent, 37 per cent and 17.9 per cent respectively in 1970.

Only two countries in the region - Surinam and Brazil - have achieved the complete vertical integration of part of their mineral production; that is to say, they produce metallic aluminium from bauxite. Venezuela, Mexico and Argentina, the other Latin American producers of aluminium, import the alumina they need.

In recent years, about 80 per cent of Latin America's production of iron ore was exported, mostly as crude ore and, to a lesser extent, in the form of concentrates and pellets.14/ The rest is used in the region's iron and steel industry. In 1966, 16 per cent of the production of this mineral was concentrated, and in 1972, 19.5 per cent. The volume of production in sinter form 15/ rose from 3.9 per cent to 6.5 per cent during the same period and in pellet form from 2.5 per cent to 7.2 per cent (see table 24). The production of pellets is expected to reach 20.4 million tons in 1976 and 57.9 million tons in 1980 (Brazil 28.5 million, Mexico 9.7 million, Peru 7.5 million, Venezuela 6.7 million, Chile 3.5 million and Argentina 2 million).

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14/ Finely-ground high-grade iron ore concentrate which is fused by heating into spheroid pellets which are used directly in the blast furnace, thereby increasing its output considerably.

15/ Obtained by the direct fusion of iron ore fines with little or no preliminary concentration, and used directly in the blast furnace.

/Table 23

Table 23

LATIN AMERICA: PRODUCTION OF BAUXITE, ALUMINA AND ALUMINIUM

(Thousands of tons)

| Country | Bauxite | | | | | | Alumina | | | | | | Aluminium | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1960 | 1966 | 1970 | 1971 | 1972 | 1973 | 1960 | 1966 | 1970 | 1971 | 1972 | 1973 | 1960 | 1966 | 1970 | 1971 | 1972 | 1973 |
| Brazil | 120.8 | 249.9 | 509.8 | 566.4 | 764.5 | 800.0 | - | 68.3 | 118.6 | 167.0 | 192.0 | 201.0 | 18.2 | 26.9 | 56.1 | 80.6 | 97.3 | 97.8 |
| Guyana | 2 141.2 | 3 357.7 | 4 417.2 | 4 233.6 | 3 727.2 | 3 719.4 | - | 301.7 | 317.0 | 305.2 | 265.3 | 269.3 | - | - | - | - | - | - |
| Jamaica | 5 872.0 | 9 061.5 | 12 105.9 | 12 543.3 | 12 988.7 | 13 489.5 | - | 803.8a/ | 1 797.4 | 1 876.3 | 2 087.3 | 2 505.9 | - | - | - | - | - | - |
| Surinam | 3 454.9 | 5 563.0 | 6 022.0 | 6 717.9 | 6 777.4 | 6 943.7 | - | 407.0 | 1 036.0 | 1 277.0 | 1 378.1 | 1 400.0 | - | 27.4 | 54.9 | 54.2 | 49.5 | 54.2 |
| Venezuela | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 22.9 | 22.4 | 23.3 | 50.0 |
| Mexico | - | - | - | - | - | - | - | - | - | - | - | - | | | 34.0 | 39.9 | 39.5 | 39.2 |

Source: Yearbook of the American Bureau of Metal Statistics, Metallgesellschaft Metal Statistics (Frankfurt am Main).

a/ Exports.

Table 24

LATIN AMERICA: PRODUCTION OF SINTER AND PELLETS

(Thousands of tons)

| | | 1966 | 1970 | 1971 | 1972 |
|---|---|---|---|---|---|
| Argentina | Sinter | - | 56 | 54 | 43 |
| | Pellets | - | - | - | - |
| Brazil | Sinter | 1 919 | 2 911 | 3 197 | 3 522 |
| | Pellets | - | 750 | 2 005 | 2 119 |
| Colombia | Sinter | - | 300 | 347 | 458 |
| | Pellets | - | - | - | - |
| Mexico | Sinter | 470 | 1 180 | 1 036 | 1 298 |
| | Pellets | - | - | 600 | 700 |
| Peru | Sinter | - | - | - | - |
| | Pellets | 1 780 | 3 676 | 3 227 | 3 570 |
| Venezuela | Sinter | 361 | 560 | 489 | 397 |
| | Pellets | - | - | - | - |
| Latin America | Sinter | 2 750 | 5 007 | 5 123 | 5 718 |
| | Pellets | 1 780 | 4 426 | 5 892 | 6 329 |

Source: Latin American Iron and Steel Institute (ILAFA).

/In order

In order to increase the level of processing of iron produced in the region and thereby raise its value added, there are good prospects for large scale exportation of semi-finished steel products (billets, blooms and slabs). Japan and the EEC have sent missions to the region to discuss the possibility. The interest shown by these potential buyers derives partly from problems of environmental pollution in their own countries and from the need to save fuels.

## 7. Employment capacity

Statistics on the employment of manpower in the Latin American mining sector are very poor and in many cases virtually non-existent. It has been found that they generally exclude employment in quarrying (sand, gravel and stone) and, in several cases, also in small-scale mining.

Table 25 illustrates the limited importance of the sector as a source of direct employment in 1970, save in Bolivia, Chile and Surinam. There has been little change in this situation in recent years.

Low employment in the mining sector is largely the result of the need to compete on world markets. In order to increase efficiency, large enterprises have been built up that involve an intensive use of capital and advanced technology, which means a high productivity per person employed. Consequently, even in countries where mining is a vital economic factor, its influence on the employment of manpower is small. However, mining does indirectly promote employment in a number of other industrial activities and services, because of the numerous and large volume of inputs it requires.

/Table 25

Table 25

LATIN AMERICA: ESTIMATES OF POPULATION EMPLOYED IN THE MINING SECTOR (EXCLUDING HYDROCARBONS), 1970

(Thousands of persons)

| | Employment in the sector | Percentage of total employment |
|---|---|---|
| Argentina | 23 | 0.3 |
| Bolivia | 60 | 3.9 |
| Brazil | 114 | 0.4 |
| Colombia | 65 | 1.1 |
| Chile | 90 | 3.5 |
| Guyana | 6 | 2.8 |
| Mexico | 185 | 1.2 |
| Peru | 70 | 1.6 |
| Surinam | 6 | 7.0 |
| Venezuela | 20 | 0.7 |
| Total | 611 | 0.9 |

Source: ECLA estimates.

## 8. Investment

Net investment 16/ in the mining sector in 1970 was estimated at between 3,000 and 3,500 million dollars. In the same year, the book value of United States enterprises in the Latin American mining sector was 2,036 million dollars.17/ According to the same source, the investment of these enterprises in the region in 1961 was 1,284 million dollars, giving an annual cumulative growth rate for the 1960s of 4.9 per cent. During the same period, their mining investments throughout the world increased at a rate of 7.2 per cent. Other major external investments came from Japanese enterprises (80 million dollars, almost entirely invested during the 1960s), Canada (principal investments in the bauxite mines of Jamaica and Guyana), the Netherlands (investment in Surinam) and France (investment in Chilean copper mines).

The main investments of Latin American origin, largely made by State enterprises, were estimated at no more than 700 million dollars in 1970.

In the 1970s, the growth rate of investment promises to be considerably higher than in the 1960s since, judging from projects that are completed, under way or programmed, total investment in the sector during the decade is expected to be around 6,600 million dollars. The main investments, by ore and country, are as follows:

| | Millions of dollars |
|---|---|
| Iron and manganese ore: principal investments in Brazil, Mexico, Peru, Chile and Argentina | 1,700 |
| Copper, lead and zinc: principal investments in Peru, Mexico and Bolivia | 2,500 18/ |
| Aluminium: principal investments in Jamaica, Brazil, Surinam, Venezuela and Argentina | 1,500 |

16/ See footnote 11.

17/ United States Department of Commerce, Survey of Current Business (several issues).

18/ Of this total, 2,000 million dollars corresponds to investment in the copper industry, on the assumption that the share of the region's production in the world total will remain at least at the same level during the 1970s.

/Millions of

| | Millions of dollars |
|---|---|
| Nickel: principal investments in the Dominican Republic, Guatemala, Colombia and Venezuela | 600 |
| Antimony, tin, phosphates, etc.: principal investments in Peru, Bolivia and Brazil | 300 |

The principal investments carried out and programmed in the region for the 1970s are described below.19/

In Brazil the most important plans involve the expansion of iron ore-producing capacity. Mention may be made of the plans of the Brazilian enterprise Cia. Vale do Río Doce (C.V.R.D.), which anticipates an investment of 500 million dollars in order to achieve an annual export capacity of 45 million tons of ore in 1975; the plan of the semi-public enterprise Mineração Brasileiras Reunidas Hanna Mining C., to develop the Aguas Claras mine at an annual rate of 10 million tons of ore with the investment of 196 million dollars; and the project, under appraisal to develop the major deposits recently discovered in Serra dos Caraxas (Amazonia) through a semi-public enterprise (C.V.R.D. and US Steel) in which it is estimated that investment in infrastructure and development will amount to around 930 million dollars. If these and other lesser plans materialize, the volume of Brazil's exports of iron ore would increse from 29 million tor in 1970 to 70 million in 1976 and 120 million in 1980.

Smaller investments are also being considered in other ores; in the case of bauxite, the Cia. Vale do Río Doce, in conjunction with foreign enterprises, anticipates spending 170 million dollars on developing the deposit situated in the Trombetas region, in the state of Amazonas, to achieve a production of 3.3 million tons of bauxite in 1977. In Macapá, also in the state of Amazonas, the construction was completed of the world's first plant for the pelletization of manganese; it makes it possible to use the low-content ores from the Cerro do Navío mines and has an annual capacity of 212,000 tons of ore.

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19/ The programmed investments will not necessarily take place in the the 1970s, but may be put off to the following decade or cancelled altogether.

/Total investment

Total investment in this plant amounted to 16 million dollars.

In Bolivia, the main investment made between the end of last decade and the beginning of the present one has been the construction of the Vinto tin refinery (brought into operation in 1971); this represented an investment of 12 million dollars, largely financed with credit provided by the Federal Republic of Germany, which enables 25 per cent of Bolivia's output to be transformed into metallic tin. In the next few years it is proposed to incrase its capacity to 20,000 tons annually; the intermediate phase will come into operation in 1975 with an annual output of 11,500 tons of refined tin. As an annex to the Vinto plant an antimony smelter is being constructed with technical and financial assistance from Czechoslovakia (output will begin during the second half of 1975); investment amounts to 9 million dollars, and annual output capacity will be 5,000 tons of metallic antimony. Other investments have also been programmed, including the bismuth,smelter in Telamayu, which would require 1.2 million dollars (it will process around 5,000 tons of concentrates annually); in addition to metallic bismuth arsenic and antimony will be recovered. Plans exist to develop the Mutún deposits (iron). Rational mining of this deposit may create an important pole of industrial development in Bolivia, which will use the region's gas and take advantage of the South American market to foster the economic development of the entire country. Minimum investment to set this project going was estimated at 220 million dollars (1970). There is also a programme to construct a mineral and metallurgical complex near Lake Titicaca to take in the mining and smelting of lead and zinc ores as well as tungsten ores and other minerals. An agreement with the Soviet Union has made it possible to set up a plant for concentrating low-grade tin ores (volatilization), which would begin operation in 1975, at a total cost of 13 million dollars.

/In Chile

In Chile an important plan for the expansion of copper-producing capacity was begun in 1967. At the end of 1966 the corresponding investment was agreed upon with several semi-public enterprises in which the Chilean State and private United States enterprises (Anaconda, Kennecott and Cerro Corporation) who had previously been concession-holders in the most important deposits, had a share. The agreements were aimed at increasing production capacity from 600,000 to 940,000 tons of copper annually, with an investment which was estimated at 550 million dollars. The work was partly completed in 1970 and continued during the next few years.

In the 1970s the projects of most scope are aimed at increasing iron and steel output. Total investment is 600 million dollars, of which 350 million will be to incrase annual steel production from 620,000 to 1 million tons. The other 250 million will be used to increase the iron ore output in qualitative and quantitative terms. Projects have been prepared to set up a plant for the dressing and concentration of iron ore with an annual capacity of 4 million tons in the El Romeral deposit. In the Algarrobo deposit the dressing and concentration plant was enlarged to bring its capacity up to 4.2 million tons of iron ore in 1975. Work was begun to bring into operation in 1977 the Boquerón Chañar mine and projects are being prepared for the setting-up in the future of a concentration plant; using magnets; in a first stage, 3 million tons of ore would be mined, and this would increase to 6 million tons in the second phase.

Work is being carried out in the port of Guacolda with a view to enlarging harbour facilities; this would mean that ships of up to 250,000 tons could be received and up to 2 million tons of ore stored. The construction of a pelletization plant will be begun in the next few years which would use high-grade material from the Algarrobo and Boquerón Chañar mines.

/A major

A major development of the mining sector is to be observed in Peru in the 1970s. Among the mineral and metallurgical projects in implementation or in preparation the following copper projects are of note: Cuajones, with an investment estimated at 620 million dollars for an annual output of 180,000 tons of fine copper; it will come into operation at the end of 1976. The copper refinery in Ilo (which will receive part of the blister from Cuajones) is designed to produce an annual 150,000 tons of electrolytic copper. It is estimated that it will come into operation in 1975 with an investment of close on 72 million dollars. Cerro Verde-Santa Rosa is already in operation, and two stages are anticipated; the first consists of the extraction of oxides with an annual output of 33,000 tons of electrolytic copper (1977) and an investment estimated at 150 million dollars. The second stage covers the development of sulphurs in the form of concentrates, with an annual output of 100,000 tons (1978) and an investment of 250 million dollars. Michiquillay is programmed to produce some 80,000 tons of concentrates per year (1980) with an estimated investment of 280 million dollars. Antamina also anticipates an output of 24,000 tons of fine copper, 23,000 tons of zinc concentrates (1980) and an estimated investment of 70 million dollars.

The Bayóvar project aims at producing 2 million tons of phosphorus rock concentrates with 30 per cent of $P_2O_5$ annually, 500,000 tons of phosphoric acid with 54 per cent of $P_2O_5$; 2 million tons of industrial salt and 200,000 tons of potassium chloride (1979). Total investment is estimated at 177 million dollars. The zinc refinery will have an annual capacity of 87,000 tons of refined zinc and 157,000 of sulphuric acid. Investment will be in the region of 70 million dollars (1976).

In Mexico, the Cananea mining company has programmed the expansion of its copper-production capacity by 33,000 tons annually, within four years, with an investment of 80 million dollars. Another copper project anticipates the bringing into operation of the La Caridad

/deposit, with

deposit, with an annual level of output of 120,000 tons of refined copper; consideration has been given to the formation of a semi-public enterprise made up of the enterprise Asarco Mexicana, the State of Mexico and private local investors; the cost of the project is estimated at around 330 million dollars. The enterprise Metalúrgica Peñoles (a majority share in which is held by the State) inaugurated the setting-up in 1974 of a zinc refinery to produce an annual 105,000 tons of this metal, 700 tons of cadmium and 180,000 tons of sulphuric acid; the total investment amounted to 72 million dollars. In 1976, the Sociedad Cobre de Sonora will begin to produce 37,000 tons of copper concentrates with an investment of nearly 128 million dollars.

The main projects for expanding the region's output of bauxite and alumina are to be found in Jamaica. The projects approved for implementation during the present decade will increase annual production to a level of 20 million tons, half of which will be exported in the form of calcinated bauxite and the other half as alumina. Anticipated investment will be 715 million dollars.

In Surinam the construction is being begun on a bauxite plant which will have an annual production capacity of 165,000 tons and will come into operation in 1976. Investment capital comes from abroad, but the Surinam Government will have the option of contributing 33 per cent.

The most important progress made in mining in the Dominican Republ was the entry into production at the end of 1971 of a mineral and metallurgical works set up by Falconbridge Dominicana for producing ferronickel; this produces some 30,000 tons of nickel content annually. The investment required was 180 million dollars and the output obtained placed the country among the main world producers of this metal.

In Guatemala, Colombia and Venezuela there are projects in the course of implementation for the mining of large-scale nickel deposits; it is anticipated that semi-public enterprises, composed of foreign enterprises and the respective Governments, will be established. A tentative estimate of investment for the present decade could amount to between 300 and 400 million dollars overall.

/In Panama,

In Panama, Colombia and Ecuador, important copper deposits have been discovered in recent years (and are at present being evaluated), some of which may call for large-scale investment during the 1970s.

In Argentina, the aluminium-producing plant, ALUAR, came into operation in 1974; situated in Puerto Madryn, it uses the energy from the hydroelectric station of Futaleufú. During its first stage, annual output amounts to 36,000 tons, which will increase to 72,000 tons in 1975. A new increase to 144,000 is anticipated at a later stage, which will leave a large surplus for export. The alumina required to feed the plant comes from abroad. Investment will amount to around 150 million dollars in the first two stages. Iron output in the form of ore will reach an annual 3.5 million tons, while pellets will have an output of 2 million tons when the Sierra Grande project comes into operation in the next few years. Investment of sums of around 80 million dollars has been programmed.

## 9. Trends in international prices

The traditional characteristic of the marketing of copper, lead, zinc, nickel and tin is a notorious price instability. Prices are predominantly determined by the economic situation in the western world, which constitutes the main consumer market for the metals and mining products of the region. The factors which affect this instability are booms and depressions in the world economy, prolonged strikes, increases in consumption owing to situations of war, the building-up and handling of strategic and speculative reserves, etc.

This instability and the problems it causes in the balance of payments of the exporter countries has led them to take part in international agreements aimed at defending the price stability of their main export products.

During the 1960s, copper prices, following a period of relative stability up to 1963 (around 30 US cents per pound on the London Metal Exchange), began to fluctuate considerably as from 1964 and reached an average of approximately 64 cents in 1970 (see table 26).

/Table 26

Table 26

VARIATION OF PRICES OF SELECTED METALS ON THE LONDON METAL EXCHANGE

(United States cents per pound)

| Metal | 1960 | 1970 | 1971 | 1972 | 1973 | 1974 |
|---|---|---|---|---|---|---|
| Copper | 30.8 | 63.9 | 49.3 | 48.5 | 80.8 | 93.2 |
| Percentage increase over previous year | - | 107.5 | -22.8 | -1.6 | 66.6 | 15.3 |
| Lead | 9.04 | 13.7 | 11.5 | 13.7 | 19.4 | 26.8 |
| Percentage increase over previous year | - | 51.1 | -16.1 | 19.1 | 41.6 | 38.1 |
| Zinc | 11.2 | 13.4 | 14.1 | 17.1 | 38.3 | 56.3 |
| Percentage increase over previous year | - | 19.6 | 5.2 | 21.3 | 124.0 | 47.0 |
| Tin | 99.9 | 163.7 | 159.4 | 170.9 | 218.1 | 372.2 |
| Percentage increase over previous year | - | 63.7 | -2.6 | 7.2 | 27.6 | 70.6 |
| Aluminium a/ | 26.0 | 28.7 | 29.0 | 26.4 | 25.0 | 34.1 |
| Percentage increase over previous year | - | 10.4 | 1.0 | -9.0 | -5.3 | 36.4 |

Source: Yearbook of the American Bureau of Metal Statistics.

a/ Principal United States producers.

/At the

At the end of the 1970s a temporary decline was observed in the economic expansion of the western world; this produced a smaller demand for copper in 1971 and again in 1972, when the price went down to less than 50 US cents per pound. In 1973, the price again rose this time to 80.8 cents, and reached its maximum limit for that year in November, with a monthly average of 103 cents. The upward trend was maintained until April 1974, and the price reached 137.5 US cents per pound. As from this date there was a considerable decline, dropping to 67.6 cents in December of that year. However, the 1974 average was 93.2 US cents per pound, 15 per cent up on 1973 and 46 per cent up on 1970.

The above account shows the extreme sensitivity of copper prices to changes in the economic situation of the western world; this takes the form of considerable fluctuations in consumption, which traditionally increases at a cumulative annual rate of approximately 4 per cent.

With a view to regulating copper prices - among other objectives - the Inter-Governmental Council of Copper Exporting Countries (CIPEC) was set up, grouping Chile, Peru, Zaire and Zambia, which control 67 per cent of world exports and 29 per cent of world output. (The other major exporter countries are Canada, the Philippines, South Africa, Australia and lastly the Western Pacific islands.) The aim of CIPEC is to ensure that fair prices are obtained for this metal, taking into account both production costs and the variation in the terms of trade. The greatest difficulties in reaching actual agreements arise when the prices reach low levels; this is apparently partly due to an appreciable difference in production costs in the different countries. There are also two reasons which limit their ability to adapt production to market trends: in the first place, since the balance of payments of these countries depends largely on copper exports, they may run a considerable risk in reducing output and thus encouraging other competitors who are trying to increase their exports; and in the second place, most output comes from

/large mines

large mines whose fixed costs constitute a large share of total costs, which may make any appreciable reduction in production levels anti-economic, vis-à-vis competitive markets. It may be observed that for social reasons too it is impossible to reduce employment capacity.

The same favourable tendency may be observed in the prices of lead and zinc as from 1964. However, fluctuations are not so pronounce as in the case of copper prices.

The slowing down of economic expansion at the end of 1970 was clearly reflected in lead prices in 1971; in 1972 a recovery was alread observed, with 1973 prices 42 per cent higher than in 1970 and 1974 prices 96 per cent higher. However, there was no such influence on the prices of zinc, demand for which in the international markets grew more rapidly than mining output, and even the annual average for 1974 showed an upward trend which in May of the same year brought prices to the unprecedented figure of 80.6 US cents per pound. Average prices in 1973 were 186 per cent higher than in 1970 and 321 per cent higher in 1974.

There is no international agency which concerns itself with regulating the prices of these metals. There only exists a study organization (The International and Zinc Study Group) sponsored by the United Nations and made up of a numerous group of producer and consumer countries. This group disseminates international statistical data on production, consumption, prices, stocks, imports, exports, etc., and publishes special studies in connexion with the industry.

The favourable economic situation which existed between 1964 and 1966 inclusive was also clearly reflected in tin prices; the economic recession of 1971 and the notable recovery of the following years had the same effect, and raised the average price 33 per cent above 1970 prices in 1973, and 127 per cent in 1974. Nevertheless, the fluctuations in prices were much milder than those which affected

/copper and

copper and lead; this could be attributed to the action of the regulating agency, which is known as the International Tin Council. This agency acts through quinquennial agreements, which commenced in mid-1956, and groups the main producer and consumer countries (with the exception of the United States) on an equal basis.

The price of gold increased from 35 dollars per troy ounce in 1970 to nearly 180 dollars at the end of 1974.

Contrary to the case of the metals considered, iron ore showed greater price stability. During the period 1968 and 1970, its prices fluctuated between 7.2 and 7.5 dollars per ton, while in 1973 they fluctuated between 8 and 9 dollars per ton.

It is noteworthy that the prices of iron ore only reacted - and that slightly - in 1970, when the effects of a large world demand for mining products had already passed. This may be attributed to the fact that in international trade in iron ore, the main role was played by transactions subject to annual or longer-term contracts and transfers between integrated enterprises; this means that variations in the market are reflected in the prices with some time lag. The depression in demand, rather than in prices, takes the form of difficulties met with by the independent producers in placing the ore (as has been the case in recent years), since although long-term contracts exist, they generally make allowances for reduction by the purchasers in the deliveries programmed. In the circumstances, the consumers are also more demanding as regards the quality of the ore.

The marketing of bauxite (and alumina) from the region has no one market where the prices are regulated by the relation between supply and demand, since the main mining centres for exports of this ore are controlled by major extra-regional enterprises producing aluminium.20/ What is involved here then are transfers between

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20/ The situation was partly modified when the Government of Guyana nationalized the Alcan mines in Guyana in 1971.

subsidiary enterprises, such that the prices are established nominally, mainly on the basis of the production costs of the raw material. For the reason given, between 72 and 100 per cent of bauxite exports by the countries of the region at the beginning of the 1970s was destined for the United States and Canada.

It is probable that the emergence in recent years of plentiful production and exports of bauxite in Australia, a large part of which is not destined for the integrated enterprises, will determine the establishment of trading prices for this product.

## 10. Legal and administrative aspects

The changes begun in the legal and administrative aspects of mining activity during the 1960s have continued into the 1970s.

The United Nations General Assembly at its Sixth Special Session,21/ proclaimed that the New International Economic Order should be based, among other principles, on respect for the following:

> "Full permanent sovereignty of every State over its natural resources and all economic activities. In order to safeguard these resources, each State is entitled to exercise effective control over them and their exploitation with means suitable to its own situation, including the right for nationalization or transfer of ownership to its nationals, this right being an expression of the full permanent sovereignty of the State. No State may be subjected to economic, political or any other type of coercion to prevent the free and full exercise of this inalienable right;
>
> "The right of all States, territories and people under foreign occupation, alien and colonial domination or apartheid to restitution and full compensation for the exploitation and depletion of, and damages to, the natural resources and all other resources of those States, territories and peoples."

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21/ Resolution 3201 (S-VI), 1 May 1974.

/In practice,

In practice, the creation of semi-public companies with the participation of foreign mining enterprises and national capital, whether of State or private origin, has been fostered. In other cases the mining activity in deposits considered to be key elements for national development has been nationalized, while private activity has lingered on in other sectors of mining. In any case, State intervention is emerging at the present time as the dominant feature of mining policy in Latin America. Some examples will illustrate this.

During the 1960s, Mexico reserved the concession of mines and processing plants to Mexican citizens and to companies in which the majority of shares were Mexican-held, and also granted a tax exemption of 50 per cent to all the concession-holders whose capital structure conformed to these conditions; this then was the beginning of the mexicanization of the mining sector, which was practically completed by 1972.

The Government of Chile had entered into association with the large foreign copper companies, with a majority or minority of shares according to the case. Later, the constitutional reform of July 1971 abolished private rights in the main copper mines and nationalized the remaining goods of the concession-holder enterprises, granting compensation equal to the book value less excessive returns. The Decree of 9 October 1972 established a trade monopoly for copper exports and their products, and made the Copper Corporation (CODELCO) responsible for carrying this out. The Government which took over the country in September 1973 maintained nationalization, but compromised with the nationalized enterprises over the payment of compensation.22/ These payments would correspond to the 49 per cent share of the above-mentioned foreign enterprises in the companies which had been nationalized. The remaining 51 per cent already belonged to CODELCO.

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22/ See, Diario Oficial de la República de Chile (24 July 1974); World Mining (November 1974); and Mining Journal (November 1974).

/In Bolivia,

In Bolivia, under Executive Decree 9138 of 12 March 1970, the iron mine of Mutún was reserved for exclusive development by the State through the Bolivian Mining Corporation (COMIBOL). Executive Decree 9477 of 30 November 1970 reformed the Mining Code and set up a State monopoly for activities connected with smelting and refining ore; however, the smelters already in existence were respected

In Colombia, Law 20 of 1969 and its by-law 1275 (1970), known as the Mining Statute, abolished private rights in mines for the future, respecting those in existence and duly acquired before the enactment of this Statute.

The general Law on mining, drawn up by Peru in June 1971, gave impulse to State action and also gave guarantees and exemptions to private activity; thus, under present Peruvian law, the state enterpris MINEROPERU will develop the copper mine of Cerro Verde, while the foreign enterprise Southern Peru has undertaken the Cuajones mining project.

In Brazil, mining development aimed above all at encouraging private investment, including foreign investments holding minority shares in private or Brazilian state enterprises; however, Brazil's main mining company, Companhia Vale do Rio Doce, is wholly Brazilian an its majority share-holder is the Federal Government.

In 1971 Guyana nationalized the goods of the foreign enterprise exploiting the largest bauxite mine in the country.

In Venezuela, the State took sovereign and final possession of its iron mines, which is the country's second export item, on 1 January 1975. In twelve foreign companies which had been developing the iron industry since 1950 received a compensation of 120 million dollars for the transfer of their undepreciated assets.

## 11. Some possibilities for speeding-up the development of mining

Situations in Latin America fluctuate from one country to another; however, there exist factors which are common to serveral of them and which give validity to some fairly general observations. Some of the main problems of the sector, and some strategies which it could apply are given below.

It is considered that there are many mining resources in the region which could constitute active factors of development, with sufficient geological and mining know-how to bring them to light. Apart from vast areas which remain outside still incipient research (mountain chains, jungles, unpopulated areas, etc.), there exist others which are known and have even been developed, but merit more intensive research so as to maintain and increase output. It thus would appear advisable to promote a better overall acquaintance with the mining resources of the region and the feasibility of their economic development. Mention should be made of the possibility of resorting to avanced prospection technologies (geochemistry, geophysics - including radar reconnaissance, remote sensing, etc.), which enables the mining potential even of extensive virgin territory to be accurately appraised, as well as the need to provide technical and financial backing to the agencies responsible for the exploration of mining resources.

The decline of the share of Latin America in world mining output stems to a large extent from an inadequate rate of investment. The tendency towards increasing State intervention in these activities, replacing private initiative, places greater financial demands on fiscal resources. As these in turn have to satisfy other priority needs, an inadequate allocation of resources to the sector may be observed in some cases. It is therefore advisable for each government, according to its basic trends, to formulate efficient mining investment policies.

/Another aspect

Another aspect which should be mentioned is the inadequate share of the countries in the marketing of their mining exports, frequently to a detriment of the prices they obtain. It would thus seem a good policy to encourage a more active mass-participation of the mineral-exporting countries, which should pool their marketing policies in order to obtain better selling conditions.

Although the main mining enterprises have made progress in the vertical integration of their activities, considerable margins still remain for the processing of mining products; this would allow an increase in the value added in the exports of these and in import substitution. Consideration should be given to the probable settlement in the region of some activities which are over-concentrated in the industrialized countries, where they are already causing problems of environment pollution.

The external trade of some countries shows heavy dependence on exports of one specific mining product, with all the problems attendant on its marked fluctuations in the international markets. To diminish these effects it would be necessary to encourage diversification in mining output where mineralogical conditions so justify.

Mining law in some countries of Latin America has not been adjusted to the conditions in force at the present time, or if it has this has only been partial, which means that to some extent it is slowing down the progress of the sector instead of fostering it. It would be advisable for these countries to bring out new legal norms so that mining can carry out the role which corresponds to it in economic and social development.