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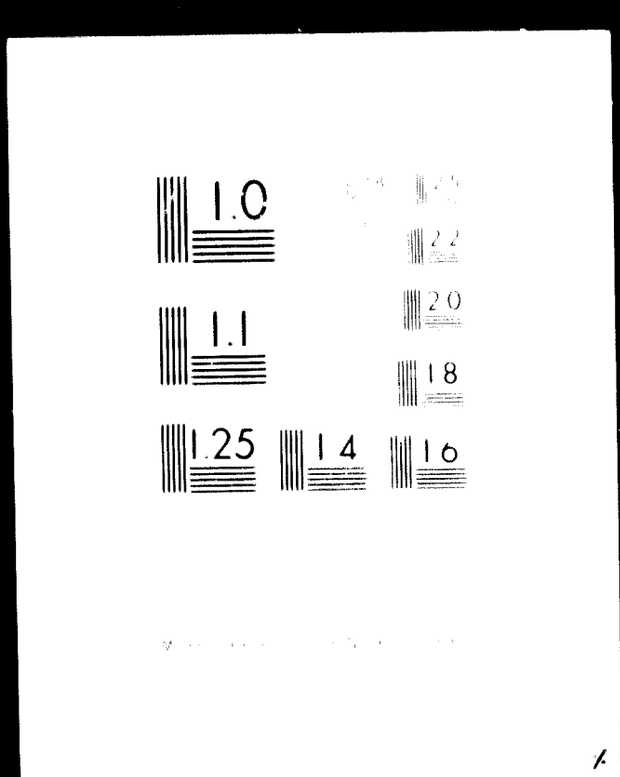

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# THE INDUSTRY OF CAPITAL GOODS IN CENTRAL AMERICA

Report elaborated by Mr. Fernando Mora, official of the Industrial Development Section of the Economic Commission for Latin America, Mexico office, for the Preparatory Meeting of Experts to the Consultive Meeting on Capital Goods Industry, convened by ONUDI in Vienna, November 1977. The opinions expressed herein are of the exclusive responsibility of the author and do not necessarily coincide with those of the Economic Commission for Latin America.

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/IV. Expansion

# FOREWORD

The Second General Conference of the United Nations Industrial Development Organization (UNIDO), held in March 1975, in Lima, Peru, proposed the establishment at regional, inter-regional and sectorial levels, of a system for consultation in the industrial sector, with a view to fostering its development and to re-shaping an International Economic Order in this sector; the proposal was later approved by the United Nations General Assembly at its VII special session. In this respect, the Industrial Development board decided, at its tenth session, to request the Executive Director of UNIDO to hold tentative consultations on different industrial sectors, keeping in mind the priorities set out in the Declaration and Plan of Action of Lima.

Among the tasks and meetings included by UNIDO in its programme of work for the biennium 1978-1979, is a consultative meeting on capital goods to be held in February 1979, the background for which is the preparatory meeting, at expert level, on this question that took place in Vienna in May 1977. On that occasion it was recommended that UNIDO should convene, towards the end of 1979, a further meeting of the group of experts on the same subject, in advance of which country studies should be made available. It was suggested that such studies should provide a clear view of the requirements that are considered basic in each country to the development of the capital goods industry and of the specific activities that form it.

The present document refers to Central America. It is based mainly on the collection and analysis of the different studies and information available in the region and that refer, in general, to the field of metallomechanics. Its scope is restricted by the complexity of the subject and the shortage of data specifically relating to capital goods, as well as by the limited time available to prepare it. It should be considered only as a preliminary effort aimed at underlining the importance of the problems and the prospects for this industry in the Central American countries. Within the mentioned limits, an attempt

/has been

has been made to examine and describe some essential features of the industrial structure in that sector, stressing the relative importance of local production of capital goods, and prospects for its expansion, as well as the policies that will have to be put into practice to encourage its development. Finally, some areas are mentioned in which international cooperation will be particularly useful for the region.

# I. INTRODUCTION[1/]

1. Central America is formed by the Republics of Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua, with a population estimated at 18 million and a total area of 441 300 square kilometres. In 1976 the gross internal product was 7 424.9 million Central American pesos with a per capita product of 410 Central American pesos, both at 1970 prices.[2/]

The present economic development of the region is characterized by a degree of industrialization close to 16%, with the agricultural and animal husbandry sector accounting for a share of the national production of goods and services of the order of 27%. In the same year, the total trade among the five participant States in the Central American group reached the level of 608.4 million Central American pesos, at present prices, a figure that shows a high degree of interdependence among the countries of the region.

2. The economic integration process that was begun by the Central American countries with the signing, in 1960, of the General Treaty on Economic Integration of Central America, has helped the region to attain high rates of economic expansion and significant changes in its productive structure, especially in the rate of industrialization. Nevertheless, in recent years the growth of the economies of the five countries has diminished because of several obstacles with which the integration process has been confronted, and that owe their origin to the lack of operation capacity of the plan adopted and to other problems of an extra-economic nature that do not fall within this context. Such obstacles have weakened the growth of manufacturing production and have

1/ As is well known, capital goods in the sense of those destined for investment, form part of the metallomechanical industry. This document will deal with such goods within the context of that industry which has been defined as that encompassing the activities included in groups 381, 382, 383 and 384 of the United Nations Uniform Industrial Classification of Economic Activities. However, for a clearer understanding of the sector, from the point of view of domestic availability of inputs and of a given infrastructure for its development, in some instances production activities of intermediate goods classified under Code 371 of the same Classification and that embrace the basic metal industries, have been included.

2/ Equal to U. S. dollars.

impeded the establishment for the regional market of industries producing intermediate and capital goods.

Since 1969, the Governments of those countries have been attempting to devise formulas and mechanisms to provide a renewed thrust to the economic integration of Central America, with emphasis, in the proposals at present under study, on the manufacturing industry as one of the priority sectors for integration. As an example of the interest of the Governments, at the national as well as the regional levels, a number of surveys and technical economic studies in different fields of industrial production have been undertaken with the support of various international organizations such as UNIDO and CEPAL, and these represent a valuable effort to determine the prospects for the zone's industrial expansion.

3. Among the industries on which the interest of those studies and surveys has been concentrated is the manufacture of metallomechanical products, owing to the favourable potential impact the rational development of that industry would have on the productive structure of the region. The majority of the studies deal with the entire metallomechanical sector and do not establish a systematic distinction between the consumer, intermediate and investment goods to which this industry can give rise.

In fact, the purpose of the studies has been rather that of designing general policies to promote an overall increase of production in the matallomechanical sector, without trying to establish a true hierarchical arrangement of the type of products that could be given priority in the manufacturing process. The dominant criteria in industrial promotion activities have been the earning power of investments and import substitution, mostly at the national level, and this explains why the relevant programmes have been limited up to now to the promotion of investments in metallomechanical industries, for the most part in those that produce consumer goods and, to some extent, also to those producing intermediate goods.

4. Recently, however, the Central American Governments have shown an interest in encouraging the capital goods industry, due largely to

/the high

the high proportion of imports from outside the region that the industry accounts for, and to the inflexibility and excessive dependence that this situation introduces into their development policies. On the other hand, the difficulties and risks involved in launching the Central American region on a straightforward development process of capital goods industries could be faced by the concerted and rational development of these activities, for which there would be available the mechanisms for inter-regional and international cooperation.

/II. DESCRIPTION

## II. DESCRIPTION OF THE STRUCTURE OF THE INDUSTRY

1. Apparent consumption of metallomechanical products increased from 235.4 million Central American pesos (at 1970 constant value) in 1960 to 928.4 million in 1975. Production increased its contribution to consumer supply from 34.4 million Central American pesos, at 1970 constant value, to 261.6 million in the same period.

The rates of growth of apparent consumption and production have been estimated at 9.5% and 14.5% respectively, which may be considered very high in comparison with the general average growth (6.9% and 7.6%) throughout the manufacturing industry. Nevertheless, as can be seen from the above figures (see table 1), the increase in the contribution of local production to the apparent consumption supply was slightly above 28% in 1975 and is well below the share achieved by the whole of the manufacturing industry, which has been estimated at between 70% and 75%.

2. Therefore, because of the reduced contribution of the regional metallomechanical industry in meeting consumer needs, the process of net substitution of imports was more limited than in the majority of other industrial sectors. Further, the concentration on consumer goods has given rise to a high import rate of intermediate products. In fact, raw materials originating in Central America account for a very small share in the total inputs of the region's metallomechanical sector. Available studies indicate that, with the exception of scrap iron and billet, production was only recently started in two of the countries in the region and that the principal raw materials used by the industry are acquired abroad; thus, present operating conditions in the metallomechanical industries are very vulnerable and depend on external markets in so far as prices and and availability of imports are concerned. This situation should change in the near future through import substitution of primary products for the metallomechanical sector, and this could clearly be associated with the projected establishment of a steel industry in Central America, which has been one of the goals of the

/Table 1

Table 1

CENTRAL AMERICA: SIGNIFICANCE AND PRODUCTIVE STRUCTURE OF THE METALLOMECHANICAL INDUSTRY, 1960, 1966, 1970, 1973 AND 1975

| CIIU Nomenclature | 1960 | 1966 | 1970 | 1973 | 1975 | Annual Growth Rates 1960-1975 | Annual Growth Rates 1970-1975 |
|---|---|---|---|---|---|---|---|
| | Millions of Central American Pesos, at 1970 prices[a/] | | | | | | |
| Apparent consumption of manufactured goods | 1 462.3 | 2 363.7 | 2 999.5 | 3 539.8 | 3 955.0 | 6.9 | |
| Metallomechanical Products | 235.4 | 499.9 | 620.8 | 753.2 | 928.4 | 9.5 | 8.4 |
| 381. Metal products | 53.0 | 135.5 | 193.6 | 236.6 | 270.0 | | |
| 382. Machinery, except electrical | 71.8 | 124.5 | 158.6 | 189.8 | 260.6 | | |
| 383. Electrical machinery, appliances, accesories and supplies | 51.4 | 127.5 | 140.4 | 171.0 | 225.6 | | |
| 384. Transport equipment | 59.2 | 112.4 | 128.2 | 155.8 | 172.2 | | |
| Gross value of industrial production | 1 008.8 | 1 683.9 | 2 263.0 | 2 753.1 | 3 010.9 | 7.6 | |
| Metallomechanical Products | 34.4 | 121.5 | 201.5 | 245.8 | 261.6 | 14.5 | |
| 381. Metal products | 11.9 | 68.3 | 119.8 | 146.6 | 148.3 | | |
| 382. Machinery, except electrical | 7.6 | 16.5 | 22.9 | 26.6 | 28.8 | | |
| 383. Electrical machinery, appliances accessories and supplies | 2.9 | 19.4 | 32.3 | 43.9 | 49.2 | | |
| 384. Transport equipment | 12.0 | 17.3 | 26.5 | 28.7 | 35.3 | | |
| Value of imported manufactured products (including Central American trade) | 512.4 | 927.1 | 1 143.5 | 1 339.2 | 1 584.7 | | |
| Metallomechanical Products | 187.9 | 373.1 | 411.8 | 503.2 | 646.3 | | |
| Value of exported metallomechanical products (including Central American trade) | 0.5 | 17.0 | 29.1 | 37.6 | 42.5 | | |
| | Percentages of the gross value of the industrial production | | | | | | |
| Gross value of metallomechanical production | 3.4 | 7.2 | 8.9 | 8.9 | 8.7 | | |

Table 1 (Conclusion)

| CIIU Nomenclature | 1960 | 1966 | 1970 | 1973 | 1975 | Annual Growth Rates 1960-1975 | Annual Growth Rates 1970-1975 |
|---|---|---|---|---|---|---|---|
| **Percentages of apparent consumption value** | | | | | | | |
| Imports of manufactured products (including Central American trade) | 35.0 | 39.2 | 38.1 | 37.8 | 40.1 | | |
| Metallomechanical Products | 79.8 | 74.6 | 66.3 | 66.8 | 69.6 | | |
| Gross value of manufactures | 69.0 | 71.2 | 75.4 | 77.8 | 76.1 | | |
| Metallomechanical Products | 14.6 | 24.3 | 32.5 | 32.6 | 28.2 | | |
| 381. Metal products | 22.5 | 50.4 | 61.9 | 62.0 | 54.9 | | |
| 382. Machinery, except electrical | 10.6 | 13.3 | 14.4 | 14.0 | 11.1 | | |
| 383. Electrical machinery, appliances, accessories and supplies | 5.6 | 15.2 | 23.0 | 25.7 | 21.3 | | |
| 384. Transport equipment | 20.3 | 15.4 | 20.7 | 18.4 | 20.5 | | |
| **Percentages of gross value of metallomechanical production** | | | | | | | |
| Metallomechanical production | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | | |
| 381. Metal products | 34.6 | 56.2 | 59.5 | 59.6 | 56.7 | | |
| 382. Machinery, except electrical | 22.1 | 13.6 | 11.4 | 10.3 | 11.0 | | |
| 383. Electrical machinery, appliances, accessories and supplies | 8.4 | 16.0 | 16.0 | 17.9 | 18.8 | | |
| 384. Transport equipment | 34.9 | 15.2 | 13.1 | 11.7 | 13.5 | | |

Source: Preliminary figures, based on information collected for the preparation of an industrial development model in Central America.

a/ One Central American peso equals one U.S. dollar.

a/countries

countries in the region from the beginning of the economic integration process.[1/] In the longer term, it might also be possible to develop the primary aluminium industry. In both cases, it will first be necessary to determine accurately the characteristics of the region's mineral resources.

3. The metallomechanical sector is last in order of importance in the manufacturing industry, as can be appreciated from the available figures (see again table 1). In general terms, in 1975 those industries contributed with close to 9% of the manufacturing production of the region. The remainder was accounted for, in order of importance, by the contribution made by the group of traditional and intermediate industries. This is completely contrary to the situation that prevails in industrialized countries with planned economies, where the metallomechanical industry occupies first place in industrial production (34.0% and 39.6% respectively). Even at the beginning of the present decade the metallomechanical manufacturing industry in Latin American developing countries (Caribbean, Central and South America) as a whole contributed an average of about 17.7% of manufacturing production.[2/] This last comparison indicates in particular the noticeable lag of industry in the region and the scanty development achieved by the metallomechanical sector.

4. The structure of Central American production in the metallomechanical sector has been estimated for 1975 as follows:

| CIIU | Activities | Percentage |
|---|---|---|
| 381. | Metal products | 56.7 |
| 382. | Machinery, except electrical | 11.0 |
| 383. | Electrical machinery, appliances, parts and supplies | 18.8 |
| 384. | Transport equipment | 13.5 |

1/ See Desarrollo integrado de un proyecto siderúrgico en Centroamérica (Integrated Development of a Steel Project in Central America) (E/CEPAL/CCE/338), July 1977.

2/ United Nations, Economic Commission for Europe (ECE), Role and Place of Engineering Industries in National and World Economies, New York, 1974, Vol. I, table 1.

/Compared

Compared to that of other countries, especially to the Latin American average, this structure also demonstrates the weakness of the regional metallomechanical sector (see table 2), distinguished by production concentrated on durable consumer goods, to judge by the greater relative weight of the metallic and electrical products groups, which in 1975 together represented 75.5% of the value of metallomechanical production. Although sufficient information to classify the metallomechanical production sector into consumer, intermediate and capital goods is not available, surveys carried out among the main companies in two countries (El Salvador in 1975 and Guatemala in 1973) show that, in the first case, the share under the heading of electrical machinery, which may be considered as comprising capital goods, represents 0.2% of the added value of the whole metallomechanical sector on which the survey was untertaken, and, in the other country, it represents 1.0% of the volume of production. On the other hand, the survey carried out in Costa Rica in 1975 showed that the value of production under the heading of "capital goods and parts" represented 1.5% of the total for the metallomechanical sector (see table 3). All of which leads to the assumption that in the other two countries the situation is very similar, if not even more unfavourable.

A more detailed analysis of the different groups making up the metallomechanical sector provides a further basis for judgement. Among the industrial activities of the group headed "metal products" the production of metal structures, containers, wire articles, aluminium products for domestic use, metal furniture, machetes, crown corks, tinplate, etc., stands out owing to its relative importance. The studies conducted in respect of these sectors conclude that, due to the level of self-supply already achieved in most of them, future projects relating to these activities should place emphasis not so much on the creation of new capacity but rather on technical improvements and the standardization of production in those already existing.[3/]

3/ See, for example: ICAITI, Informe sobre la situación de la industria metalmecánica en Guatemala (Report on the Situation of the Metallomechanical Industry in Guatemala), Guatemala, 1975.

/Table 2

Table 2

CENTRAL AMERICA: COMPARISON OF THE STRUCTURE OF METALLOMECHANICAL PRODUCTION

(Percentages)

| | Central America | Latin America | Industrialized countries |
|---|---|---|---|
| Metal products | 56.7 | 24 | 6 |
| Machinery, except electrical | 11.0 | 18 | 33 |
| Electrical machinery, appliances, accessories and supplies | 18.8 | 20 | 24 |
| Transport equipment | 13.5 | 38 | 37 |

Source: Preliminary estimates by ECLA and Ramiro Paz, Informe final para la SIECA (Final Report to SIECA) (UNIDO/IPPD.172).

/Table 3

Table 3

CENTRAL AMERICA: EXPLANATORY DATA ON THE SHARE OF CAPITAL GOODS OF THE TOTAL PRODUCTION IN THE METALLO-MECHANICAL SECTOR

(Percentages)

| | Local production heading | Share |
|---|---|---|
| Costa Rica | Capital goods and parts | 1.5 of production's gross value |
| El Salvador | Non-electrical machinery | 0.2 of the added value |
| Guatemala | Industrial agricultural machinery and equipment | 1.0 of volume (M.T.) |

Source: Based on surveys contained in the following works: Ministry of Economy, Industry and Commerce of Costa Rica, Estudio preliminar de la industria metalmecánica, (Preliminary Study of the Metallomechanical Industry), prepared with the advice of UNIDO, October 1974.
Plan operativo del desarrollo de la rama metalmecánica (Plan of Operation for the Development of the Metallomechanical Sector), prepared with the cooperation of Mr. A. Caruso, UNIDO expert, El Salvador, October 1976.
ICAITI, Informe sobre la situación de la industria metalmecánica en Guatemala, 1975 (Report on the Situation of the Metallomechanical Industry in Guatemala).

/Since the

Since the setting up of the Central American Common Market the share of the "metal products" group in the productive structure has shown a tendency to increase, which no doubt - together with the relatively low demand for skilled labour in some of the industries - has given rise to the expansion of production in the whole metallomechanical sector, as has been already mentioned.

The heading "electrical machinery, appliances, parts and supplies", occupies second place (18.8%) in value of metallomechanical production; it is made up of industries that manufacture and assemble consumer goods such as electric light bulbs, fluorescent lamps, electro-domestic and electro-commercial appliances (radios, television sets, stoves, refrigerators, washing machines, air conditioners), cables and insulated wire, conduit boxes, etc. The activities that encompass the electro-mechanical industry in Central America consist mainly in the assembly of parts and components imported from outside the region - the companies undertaking this operation are supervised by their parent firms located abroad and their degree of integration is, therefore, reduced;[4/] on the other hand, no electrical machinery is produced.[5/]

The group "transport equipment" occupies third place in terms of gross production value (13.5%); bodies for trucks, buses and minibuses are produced, as well as wheelbarrows; automobiles are also assembled, the motor vehicle and aircraft fleets are repaired and maintained, and recently automobile engines have been rebuilt. Except in the case of motor vehicle bodies, the added value contribution of these industries is very low due to their limited integration and to the high proportion of imports.

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4/ See, Ministry of Economy, Industry and Commerce of Costa Rica, Estudio preliminar de la industria metalmecánica (Preliminary Study of the Metallomechanical Industry), prepared with the advice of UNIDO, October 1974.

5/ See Plan operativo del desarrollo de la rama metalmecánica (Plan of Operation for the Development of the Metallomechanical Sector), prepared with the cooperation of Mr. A. Caruso, UNIDO expert, El Salvador, October 1976.

/The heading

The heading "machinery and equipment, except electrical", with a production value equivalent to 11% of the total for the sector, occupies last place in the productive structure. With a few exceptions, hardly any capital goods are produced in the region and, where they are, they seldom form part of a manufacturing plan on an adequate commercial scale, as can be seen from the available information for the two countries with the area's greatest degree of industrialization.[6/] In the first country, only centrifugal pumps and scales are produced in commercial quantities, and from time to time orders are taken for a great diversity of machines, mainly for agriculture, such as sugar cane mills, coffee grinders, corn dough mills, pulp removing machines, coffee dryers, coffee processing equipment and equipment for sugar mills, and conveyors and load lifters. Production, estimated at 322.2 metric tons, represents about 1.0% of the total volume in the metallomechanical sector. In the other country, according to data provided by the principal companies, the non-electrical machinery heading represents only 0.2% of added value in the metallo-mechanical sector. Information from other sources seems to indicate that in the other countries of the region a similar situation exists, and apparently with an even smaller degree of industrial inter-relationship.

5. To sum up, it can be shown that in the Central American Common Market, a very important part of the nascent capital goods industry is aimed at the agricultural sector and, in particular, at the manufacture of hand tools, machinery and equipment for that sector. A feature of the metallomechanical sector in general is its small degree of integration; there is practically no inter-relationship either at the national or at the industrial levels. This explains, in part, the low production of intermediate goods and the almost non-existence of capital goods productive activity, but in great measure it is due also to the fact that, for the most part, production under the headings accounting for the region's requirements as to technology and scale economies, and therefore stringent financial implications, as well as needing trained human resources.

6/ See Informe sobre la situación de la industria metalmecánica en Guatemala, op. cit., and Plan operativo del desarrollo de la rama metalmecánica, op. cit.

## III. DESCRIPTION OF PRESENT CAPITAL GOODS PRODUCTION[1/]

### 1. Technical-economic conditions

The considerations presented here on the technical and economic conditions of capital goods production in Central America and the range of products included, are based on an analysis of a group of companies engaged in that activity, since the surveys available only cover part of them and two or three countries in the region, depending on the aspects analyzed. Nevertheless, it is considered that the data collected for the surveys, referring as they do to the countries in the region with a relatively more advanced productive structure, may be taken as reliable indicators, since they relate to firms that were selected precisely because they are representative of the sector analyzed.

Table 4, which suffers from the above-mentioned limitations, contains the essential elements to judge the most notable features of this industry at the present time. In the first place, it indicates that in the distribution of manufacturing plants, the largest group is formed by small companies with from one to 20 workers; the next group is made up of units of medium size, with between 21 and 70 workers. Apparently no company larger than this produces capital goods. On the other hand, capital investment per person, estimated at 12 600 Central American pesos, is above the average for the metallomechanics sector in the countries under review.[2/]

The relation between production and occupied labour is of the order of 5 000 Central American pesos, too low a figure if compared with the rest of the metallomechanical industries of Central America and, of course,

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1/ The qualitative and quantitative information included in this part of the report is taken mainly from the studies on Guatemala, Costa Rica and El Salvador already mentioned and from: Investigación y desarrollo de la industria de implementos y máquinas agrícolas en Centroamérica (Research on and development of the agricultural implements and machinery industry in Central America), F. Morales and E. Gasparetto, UNIDO, Guatemala, 16 November 1972.

2/ Estimated at approximately 7 500 Central American pesos.

/Table 4

Table 4

CENTRAL AMERICA: EXPLANATORY DATA ON THE SIZE OF PLANT, INVESTMENT, PRODUCTIVITY AND IDLE CAPACITY IN THE CAPITAL GOODS INDUSTRY, 1973

| Country and Activity | No. of firms covered by survey | Size of firms a/ | | | Fixed capital investment (millions of Central American Pesos) b/ | Gross Value of Production (millions of Central American Pesos) b/ | Employees | Productivity production/ employee (Central American Pesos) b/ | Idle capacity (%) | Capital density capital employee (Central American Pesos) b/ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Small | Medium | Large | | | | | | |
| Total | 16 | 11 | 5 | - | 5.0 | 1.9 | 395 | 4 800 | - | 12 600 |
| Costa Rica | | | | | | | | | | |
| Capital goods and spare parts | 10 | 6 | 4 | - | 4.0 | 1.4 | 305 | 4 500 | 45 | - |
| Guatemala | | | | | | | | | | |
| Agricultural and industrial machinery and equipment | 6 | 5 | 1 | - | 1.0 | 0.5 | 90 | 5 500 | 30-50 | - |

Source: Estudio preliminar de la industria metalmecánica (Preliminary Study on the Metallomechanical Industry), prepared by the Ministry of Economy, Industry and Commerce, with the advice of UNIDO, October 1974. ICAITI, Informe sobre la situación de la industria metalmecánica en Guatemala, 1975 (Report on the Situation of the Metallomechanical Industry in Guatemala).

Note: It was only possible to obtain information for two countries.

a/ This classification corresponds approximately to large, more than 70 employees; medium, 21 to 70 employees; small up to 20 employees.

b/ One Central American peso is equal to one U.S. dollar.

/with country

with country averages where the industry has the greatest relative development.[3/] Furthermore, available information indicates that there is a low level of plant utilization varying from 30% to 50% for the capital goods industry covered by the surveys. In one of the countries,[4/] this rate has been estimated at 45%, and is below the average for the metallomechanical sector as a whole (59%). Among the factors hindering the reduction of the region's idle productive capacity are the limited size of the market, resulting in a certain degree of over-investment, difficulties in the supply of raw materials, shortage of skilled labour and of financial resources and, in general terms, insufficient use of planning and administration techniques in company management.

Although this industry is at an initial stage in Central America and, in consequence, statistics on the demand for human resources are incomplete, studies conducted up to now underline the lack of skilled personnel as one of the main problems adversely affecting the expansion of present production, and one which must be given priority in personnel training programmes.

As previously mentioned, the availability of basic inputs represents another of the restrictions in the development of this industry in Central America. Although the availability of electric energy can be considered as adequate, the same does not apply to other inputs such as iron castings, different types of metal sheets and shapes and die-forged parts, almost all of which come from abroad. Scrap iron and the billet made from it, some types of castings and forgings and the construction of molds, are among the few inputs that are produced in the region for the metallo-mechanical sector in general, but even these suffer from serious technical shortcomings that prevent the standardization of supplies, a fact that is reflected in high prices and in quality problems.

3/ See Informe sobre la situación de la industria metalmecánica en Guatemala, op. cit., and NAFINSA-UNIDO, México: Una estrategia para desarrollar la industria de bienes de capital (Mexico: A Strategy to Develop the Capital Goods Industry), Mexico, 1977; in the former productivity has been estimated at 8 000 dollars for the whole sector of metallomechanics and, in the latter, the coefficient is calculated at 24 000 dollars as an average in capital goods.

4/ See Estudio preliminar de la industria metalmecánica, op. cit.

/The serious

The serious limitations that the technical and economic features so far mentioned represent to the development of capital goods production also have a negative effect on the efficiency of the industry and give rise to two strata of industries among the specific companies producing some capital goods; the first is made up of the group of companies that only manufacture capital goods and that obtain technology, trade marks and technical assistance from abroad; they export industrial products, have quality control systems and line flow production. The second and more numerous is formed by shops that produce only on order, lack a planning and design unit, frequently copy models already in use, and do not have the means to carry out quality control tests. The organization of companies in this latter group is on the family or artisan type. These facts, together with the weak productive structure mentioned in the previous section, lead to the conclusion that capital goods manufacture suffers, in general, from a low technical level of operation that restrains both its present production as well as its future development.

## 2. Limits to the quality of local production

As has been outlined in the previous remarks, the development of the capital goods industry in the metallomechanical sector is very rudimentary. A look at the composition of the region's imports confirms this as, with only few exceptions, the domestic demand for these goods is totally supplied by purchases from outside the area.[5/] In the following section a partial list is given of local production of capital goods, which complements this overall assessment and describes the types that are produced.

5/ One of these exceptional cases is that of hand tools under the heading of "agricultural machines and tools for agriculture", for which Central American imports, from within its own common market, have reached 93%. See, in this respect: Investigación y desarrollo de la industria de implementos y máquinas agrícolas en Centroamérica, op. cit.

## 3. Production of machinery, implements and hand tools for agriculture

Central America produces corn, rice, coffee, sugar cane and bananas. Except in the case of the last-mentioned plantation, in each country different types of machines have been developed, with some variations, e.g. drying machines for the basic grains, and machines to grind corn and process coffee and sugar. The following is a list of some of them:

### a) Hand tools

Machetes, spades, picks and hoes. The installed plants supply almost all domestic requirements, and export part of their production. They are connected to foreign companies and the manufacturing methods differ in each case according to the standards of the parent companies, although quality is not normally that of the international market.

### b) Tilling implements

Disk ploughs, disk harrows and agricultural trailers. The manufacture of these implements is primitive and in general is at the artisan level. In several countries disks are sometimes produced on an experimental basis.

### c) Drying machines for basic grains, coffee processing and sugar production equipment

Several firms produce certain types of kernel dryers that increase yields; for this they quite frequently use international blueprints and specifications that have been adapted to local conditions. Both the dryers and the equipment included in this group are generally manufactured on order in different sizes.

### d) Corn and coffee mills, sugar cane mills, coffee pulp removers

Sugar cane crusher rolls, conveyors and load lifters. These are generally produced in limited quantities on an artisan basis. The possibility has been suggested of standardizing a line flow production of some types of mills, conveyors and load lifters, as well as of the dryers already referred to.

/4. Production

## 4. Production of other types of machinery

### a) Centrifugal pumps and scales

New and advanced plant and technology are available, as are trade marks and technical assistance from abroad. The means to carry out tests and quality controls are also accessible. Manufacture is almost completely integrated since only a limited number of parts are imported, and a large part of the production is exported within the Central American area.

### b) Transfer and flexographic machines for the paper and textile printing industries

Certain types of machines are designed within the manufacturing company itself and are modifications of others adapted to local conditions. Although this is a type of personal enterprise, it is carried out on a sound basis both technically and operationally.

### c) Pressure tanks

Pressure tanks are manufactured in one of the countries, and the firm producing them is a subsidiary of an international company.

### d) Bodies for motor vehicles for use in cargo and passenger transport

Under this heading supply is satisfactory and there is sufficient experience locally. The organization of the companies is relatively good and plant and machinery are modern. A considerable number of companies are subsidiaries of foreign firms and operate with imported technical assistance and capital.

### e) Equipment for commercial refrigeration

These types of products include refrigerated glass display counters and show cases, bottle coolers, commercial refrigerators and freezers. The industry possesses the technical elements necessary for its

/development

development and some firms make use of foreign trade marks and technical assistance.

f) Boats

There are some firms engaged in building boats made of wood and fibre glass. One of them has stated that it has the capacity to build "long liner" fishing boats to catch tuna and shrimp.

The above outline, which is not complete, gives an idea of the position of the Central American region in capital goods production and reaffirms what has previously been expressed in the sense that its development is in the initial stage and has not yet gone beyond the experimental phase.

## IV. EXPANSION PROSPECTS FOR THE CAPITAL GOODS INDUSTRY

### a) Description of future demand

In 1975 the internal demand in Central America for metallomechanical products, including capital goods, was over 900 million Central American pesos, at 1970 prices (see again table 1). Local production is directed, with few exceptions[1/] to the internal market, as exports take place within the region itself. Capital goods have practically no share in sales outside Central America and in this sector external demand has not played an important role in local production.

The average annual increase of internal demand for metallomechanical products - including capital goods - was 9.5% between 1960 and 1975, and 8.4% between 1970 and 1975. In turn, in the latter period, the gross formation of fixed capital in the region registered an annual average increase of 7.2%, by rising from 817.3 to 1 157.6 million Central American pesos in 1970.[2/]

The comparison between these indicators shows that the internal demand for metallomechanical products and capital goods continues to be dynamic with a tendency to rise, and this in spite of the contraction in the rate of increase that can be detected towards the latter part of the 1970-1975 period; this tendency is mainly accounted for by the stimulous resulting from increased demand in sectors such as the construction industry, the establishment of important new manufacturing industries and mining activities, the modernization of agriculture and its links with the industry, and the enlargement of collective transport

1/ These exceptions refer to metallomechanical products that may be broadly considered as industrially produced and that are exported to Panama, Cuba and other Caribbean countries; therefore, the assembly of articles for export is not considered.

2/ Evolución de la economía centroamericana en 1976 (Progress of the Central American Economy in 1976), ECLA/MEX/77/12, April 1977.

services. As for external demand, studies on the productivity and competitive capacity of their metallomechanical industries were recently undertaken by some countries in the region to determine the possibilities of exporting to non-traditional markets.

The absence of studies on demand and on macro-economic planning in relation to demand, both for the whole metallomechanical sector and for capital goods in particular, was a great hindrance in the preparation of this report. All that was available was a project at the individual product level and covering the entire region under the heading of agricultural machinery and tools, and although that is a survey on prospects for the near future (1980), it is of value in that it provides information for assessing specific intermediate-term projects for domestic and foreign markets. In accordance with that outline (see table 5), and with various studies prepared on investment projects within the Central American Common Market by the Governments and by regional institutions, it may be said that the size of the demand under some headings included in the project provides a satisfactory basis for the expansion of future production of such capital goods.

b) Some main obstacles to increasing production

The shortage of skilled human resources and of raw materials of Central American origin constitutes a principal obstacle to increasing production in both the metallomechanical sector and of capital goods.

Although the difficulties vary from one industry to another, depending on the characteristics of the different products, on volume of production, and on manufacturing complexity, several studies have established that the lack of skilled personnel is critical. For example, there is a need for skilled workers for foundries and forging plants, for machine tool operation and for metal lumber. There is a deficit of medium-level technicians, industrial engineers, mechanics, electricians and managers who can prepare and implement development projects and organize and direct industrial enterprises on a professional level.

/Table 5

Table 5

CENTRAL AMERICA: ESTIMATES OF APPARENT CONSUMPTION OF AGRICULTURAL MACHINERY AND TOOLS, 1975 AND 1980

| | Central American Common Market | | | Panama | | | Central American Common Market | | | Panama | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | Volume (tons) | Value (thousands of CA pesos) | Units | Volume (tons) | Value (thousands of CA pesos) | Units | Volume (tons) | Value (thousands of CA pesos) | Units | Volume (tons) | Value (thousands of CA pesos |
| Hand tools | - | 1 625 | 2 140 | - | 132 | 210 | - | 1 860 | 2 450 | - | 150 | 240 |
| Ploughs | 810 | 368 | 347 | 130 | 58 | 67 | 915 | 423 | 397 | 147 | 66 | 76 |
| Cultivators | 333 | 94 | 112 | 34 | 17 | 20 | 377 | 107 | 129 | 39 | 20 | 23 |
| Harrows | 880 | 493 | 462 | 80 | 95 | 87 | 995 | 564 | 529 | 90 | 109 | 99 |
| Sowers | 950 | 110 | 143 | 154 | 18 | 20 | 1 080 | 126 | 163 | 175 | 20 | 23 |
| Other soil cultivating machinery | - | 203 | 354 | - | 60 | 90 | - | 233 | 403 | - | 69 | 103 |
| Mobile harvesting machines | - | 745 | 1 170 | - | 267 | 378 | - | 848 | 1 327 | - | 305 | 431 |
| Threshers, shellers and machines for coffee and rice processing | - | 1 085 | 2 200 | - | 422 | 705 | - | 1 355 | 2 610 | - | 481 | 805 |
| Machinery for dairy and poultry farms | - | 42 | 217 | - | 15 | 85 | - | 48 | 247 | - | 17 | 97 |
| Selecting and grading machines | - | 37 | 156 | - | 14 | 46 | - | 42 | 180 | - | 16 | 52 |
| Other agricultural and horticultural machines | - | 660 | 890 | - | 84 | 178 | - | 755 | 1 015 | - | 96 | 203 |
| Tractors | 2 830 | 7 750 | 14 900 | 685 | 2 480 | 4 380 | 3 190 | 8 850 | 17 000 | 775 | 2 790 | 4 950 |

Source: Investigación y desarrollo de la industria de implementos y máquinas agrícolas en Centroamérica (Research on and Development of the Agricultural Implements and Machinery Industry in Central America), F. Morales and E. Gasparetto, UNIDO, Guatemala, 16 November 1972.

/The

The institutions that train skilled labourers and those providing medium and higher education, have put several programmes into effect - some of which consist of short training periods - to help overcome some of these deficiencies. Among the proposals to deal with this problem special mention should be made of : the fellowship scheme to train workers, who are graduates from the national institutions, in foreign plants; the contracting of technicians from abroad, for instance in the case of the molding and stamping machine production industry, and the creation of a Central American regional centre to train skilled personnel, especially in the metallomechanical sector of the intermediate goods industry (metallurgical, ferrous and non-ferrous foundries, etc.).

The dependence of the region's metallomechanical industry on foreign inputs and parts is excessive and restricts possibilities to increase production, since this is bound to price variations and to the availability, in the international market, of the necessary inputs. The metallomechanical industry in the region - in spite of some recent progress [3/] still depends on scrap iron for billet production, which is an input of widespread use in the metallomechanical industry; foundry products are mostly imported; metal shapes and sheets as well as stamped parts are mainly acquired outside the Central American region.

The lack of quality control facilities and the low level of technical efficiency in the industries also constitute serious obstacles that have to be overcome. In this respect, studies available coincide in that the most critical situation is that relating to input production activities. In one such study - prepared by an organization specializing in industrial technology and research,[4/] it is stated that the metallomechanical industry, with some exceptions,

3/ For example, the recently built electric continuous casting steel mill in El Salvador.

4/ Informe sobre la situación de la industria metalmecánica en Guatemala, op. cit.

/lacks quality

lacks quality control facilities and that the efficiency of production methods and processes is very low, particularly in small plants.

The physical expansion of production could be based, in part, on a better use of idle capacity and on the introduction of some improvements into existing capacity. The possibility of that ocurring will depend on adequate solutions being found to the problems previously identified (mainly the dearth of skilled labour and raw material supply conditions). In other cases, the expansion of production will depend on the solution of problems arising from the poor technological level in the local industry in order to improve the quality of production. A significant change can only be brought about in this sense by the establishment of new enterprises with advanced foreign technology, and relatively integrated, an example of which could be wood-working machinery. In this respect, there is good experience available in the production of centrifugal pumps and scales.

The considerations set forth in this section show that there is a gap between the present metallomechanical industry and the strict requirements that are expected of new projects that should be of the greatest impact, particularly those on capital goods. Experience in other regions suggests that metallomechanical development is gradual and, therefore, it will be essential to close the gap step by step through improving technology and developing the metallomechanical infrastructure, including the training of skilled labour and the production of inputs and parts.

Finally, among the difficulties of planning and implementing production expansion projects, the limitation imposed by the size of the national, and even the regional markets should be emphasized. An increase in the range of capital goods and intermediate goods of metallomechanical origin that are of greatest importance in transforming the productive structure, will be impeded by the too limited demand at national or regional levels, which will make it impossible to begin

production on an economic basis.[5] In this respect, some studies[6] acknowledge that once new products are selected, their manufacture should be assigned to the countries in the region in accordance with the rational promotion of industrial investment and the use of available productive capacity. On the other hand, this same approach is in line with the principle that considers capital goods as basic industries that may be established by specialized multinational action of the manufacturing sector in the common market countries.[7]

c) Areas in which the expansion of regional production should be concentrated.

The expansion of capital goods production should be adapted to certain essential conditions. In the first place the level of development of Central America as a region determines the limited progress of this industry both in regard to its size and from the technological viewpoint. A major part of future production of these goods must, therefore, be undertaken with this in mind, since it entails the adoption of simple technologies that are not too sensitive to scale economies, or too demanding as to professional capacity and standardization of products, and that might be produced in medium-sized enterprises where organization and operation are in accordance with the existing capacity of the enterprises. On a smaller scale, it would be possible and advisable to include, step by step, the manufacture of

5/ Of course there is always the possibility of exporting to some countries outside the area, but so long as the internal metallo-mechanical industry does not advance towards a greater degree of integration and a higher technological level, exports will not imply greater industrial importance than manufacture on order or assembly.

6/ For instance, planning the development of a pilot project on metallo-mechanical research (Costa Rica, El Salvador, Guatemala). Ramiro Paz, Informe final para la SIECA (SIECA Final Report), (UNIDO/IPPD/172).

7/ SIECA, Desarrollo integrado de Centroamérica en la presente década, (Central American Integrated Development in the Present Decade) Volume 4, 1974.

capital goods of greater technical complexity, through the creation of industries with more advanced technologies that would raise the level of training of human resources and at the same time would disseminate the new techniques.

Notwithstanding that manufacture could be started during the last stages of production, i.e. finishing and assembly, the specific goods to be selected must have the potential to reach greater degrees of integration within the industry, so that there may be an adequate balance between imported inputs and parts and those produced in the region; they should have the capacity also to raise the technological level of the region.

Because of the inherent characteristics of these goods - aimed at increasing production - it is considered particularly important that the building of projected plants, as well as the expansion of those already existing, should take place without sacrificing efficiency or competitive levels. This consideration applies to the manufacture of basic products and other inputs directly related to the production of the goods in question. It would not otherwise be possible to achieve an expansion compatible with the requirements as they refer to production and earning power of the consuming sectors. Therefore, these industries should in principle operate under optimum conditions of utilization of the productive factors assigned to them, and this includes taking advantage of scale economies. In this respect, it should be pointed out that a major restriction is represented by the small size of the individual market in the Central American countries. This makes it necessary to plan investment projects on the basis of the economic integration of the Isthmus, where possible making them complementary, and seeking of nucleus of specialization. In many cases optimum production scales will require that part of the goods produced be destined for external markets.

The need for access to international markets and for foreign technical assistance and, in some instances, for direct investment

/from the

from the same source, requires the participation of foreign companies in the development of capital goods production. To ensure that such contributions are indeed of benefit to the region, the bargaining capacity of the area vis-a-vis those companies should be strengthened.

The role of Central American private enterprise should be more important that that of foreign capital and its impact must be increasingly more significant. To that end, and as is suggested in several studies, the State could create the means to strengthen the local entrepreneur, among which might be included public sector purchases and the formation of joint and public enterprises, should this be deemed necessary.

In the preliminary studies on industrial projects carried out in some countries in the region, certain investment headings have been identified that would expand capital goods production and that would improve or create external economies within the metallomechanical sector. Based on those studies and on the background and descriptions set forth elsewhere in this chapter, table 6 gives an example of several of the headings under which expansion - possibly at medium term - of capital goods production, as well as of inputs and parts of metallic and metallomechanical origin, could be concentrated.

Table 6

CENTRAL AMERICA: EXAMPLE OF SOME ITEMS OF THE METALLOMECHANICAL AND CAPITAL GOODS PRODUCTION THAT COULD BE DEVELOPED

| | |
|---|---|
| Inputs and parts | Steel industry and related projects |
| | Foundry works and cast-iron parts |
| | Forging and forged parts |
| | Metal structures |
| | Die-casting |
| | Spare parts |
| Capital goods | Agricultural machinery and implements (ploughs, harrows, cultivators, tractors) |
| | Loaders, conveyors, mills and grain dryers and equipment for sugar mills |
| | Bodies for dump trucks and railway vans |
| | Railcars and coaches |
| | Machine tools for metal and wood-working |
| | Hand tools |
| | Farm machinery |
| | Machines for the food and pharmaceutical industries |
| | Telephone equipment |
| | Control boards and other devices to operate switches |
| | Boat building for tuna and shrimp fishing |
| | Distribution transformers |

# V. POLICY INSTRUMENTS AND AREAS OF INTERNATIONAL COOPERATION

## 1. Policy instruments

From the present condition of capital goods production, and throughout the metallomechanical sector as a whole, as well as the direction of future development, arises the need to design a series of policy instruments to promote the expansion of the capital goods industry and the production of the corresponding inputs and parts. Bearing in mind that in many cases the scope and field of action of such instruments, as well as decisions relating to them, will depend on specific studies at present under way or to be started, this chapter will attempt to sketch the main lines of action and the instruments that such policies should adhere to. They place definite emphasis on training of human resources, revision of the tariff regime, financing, transfer of technology and technological research, standardization of quality, preparation of studies, joint programming and promotion, and technical assistance.

The preparation of a programmed plan of the development that is expected from this sector in a given period must precede the putting into effect of a group of policy measures such as those set forth.

### a) Training of human resources

There are several national intermediate and higher education institutions in the countries of the region, and others that specialize in human resources training. Some of these have installations for training operators of machine tools, in metal lumber and in some electromechanical fields.

The programmes in these institutions can in general be considered as inadequate, especially if they are considered vis-a-vis the possible expansion requirements - gradual and limited as it has been suggested that these should be - of the capital goods industry and its requisite

inputs. Attention must be directed, therefore, to the fact that a very vigorous effort will be necessary in favour of training qualified personnel which, however, must only take place following an investigation of the specific needs for personnel for such industrial activities and, once this has been done, it will be possible to prepare and implement programmes for training of human resources. That, in turn, will require estimates, however rough, of the development that production in this sector might reach. As well as considering it advisable to strengthen present national institutions and to selectively expand their training programmes, further thought might be given to the study and evaluation of a proposal presented at the beginning of this decade for the creation of a regional centre to train skilled personnel for the metallomechanical sector, in branches where the situation is the most critical, for example: metallurgy, foundering and forging.1/

b) Revision of the Central American tariff regime

In accordance with the present document, metallomechanical development, including internal production of some capital goods, has mostly taken place in the final stages of the industrial process, being dependent in large part on imports and vulnerable to the behaviour of the international market for raw materials and parts, as well as to the availability of foreign exchange to purchase them. These considerations and the proposed steps towards expanding capital goods activities, emphasize the urgency of joint action at regional level aimed at such expansion, as well as at the integration of inputs and parts production with a reasonable degree of efficiency and with the least possible degree of foreign dependence.

For some years the production of both raw materials and of capital goods will have to depend to a great extent on an adequate tariff regime which, in the first place, will ensure effective access to the Central American Common Market for the new products, and will

1/ See Ideas preliminares para el desarrollo de la industria metalmecánica en Costa Rica (Preliminary Ideas for the Development of the Metallomechanical Industry in Costa Rica), Document prepared with the advice of the UNIDO expert, Mr. A. Guizzetti.

provide them with adequate protection vis-a-vis third countries. In the second place, such protection should be selective, so as to have a direct effect on the headings where production within the region is considered desirable and feasible in the intermediate term; it must also be flexible so that it can be adjusted to the changes required by the industrial economy without impeding the improvement of longterm efficiency, or interferring with the development of a capacity to export to world markets.

In this respect, in the studies on and the negotiations for the Central American Tariff Project,[2/] preference should be given to a common external tariff for the import of inputs and parts destined for the capital goods industry, as well as their end products. It is important to underline the need for tariff policies to influence other instruments of economic policy that, like legislation on fiscal incentives (for instance, tariff exemptions for inputs and capital goods), have typical tariff-type effects that neutralize or reduce the uniformity of the customs tariffs.

c) Financing of the capital goods sector and its inputs

Credit is another instrument that is considered of importance to support and direct the expansion of capital goods production and of the corresponding raw materials. As is generally known, this activity requires proportionately greater financing than other industrial branches, both of fixed capital and of working capital, including sales in domestic and foreign markets. In this respect, it might be necessary to have more flexible and imaginative financial mechanisms than those that are traditional in the region. For instance, it is estimated that the development of a trust fund to attract local savings as a new source of financing for the capital goods investment sector could have a very positive and considerable effect; or perhaps other types, such as the

2/ During the Sixteenth Meeting of Ministers of Economy of Central America, held in July, 1976, in Guatemala, the revision of the Central American tariff regime, its range and corresponding organization were agreed upon.

mixed joint investment funds that have been designed in industrially more advanced countries, could provide support to those industries and promote, at the same time, opportune joint local and foreign capital investment.[3/] It would be worth while to analyze the possibilities of this type of mixed fund, as a means of giving impetus to future complementary metallomechanical projects, for instance between Central America and its neighbouring countries.

The financial measures proposed could also contribute to raising the degree of utilization of the installed capacity of the industry, particularly if a line of credit could be made available to finance a second shift in companies where the utilization of capacity is at a low level. Financing should also support public sector and Central American private enterprise research projects, as well as the acquisition of quality control facilities, as part of the production plants.

d) Transfer of technology and technological research

As is inferred from the above considerations, it is expected that the main contribution of foreign companies would be of a technological nature. Nevertheless, some programmes should encourage the participation of local capacity through research on and development of their own technologies.

The fact that there exists in the region the Central American Institute for Research and Industrial Technology and that some countries have National Scientific and Technological Research Councils will lend support to the establishment of joint research and development programmes; such programmes could centre on developing adequate technologies to improve or substitute those now in use that are most backward, in the manufacture and production of new products.

As it is not possible to progress simultaneously under several headings, it would be advisable to select one or two of the capital goods on which the promotion is planned, in order to concentrate technological

3/ Nacional Financiera, S. A., has established a financing mechanism with France and Italy for mixed joint investment funds. For further details, see the document Mexico, una estrategia para desarrollar la industria de bienes de capital, op. cit.

/research

research on them. In this respect, research on the agricultural machinery and equipment sector seems to be very opportune and essential for the area. Several years ago a regional study,[4/] undertaken by the United Nations Development Programme, the General Treaty on Central American Economic Integration and the Central American Institute for Research and Industrial Technology, proposed the creation of a specialized institute to plan, design, develop, adapt and test agricultural machinery, and among the long-term objectives of which were included the development of the agricultural machinery industry and the increase of agricultural and animal husbandry production. It would be useful to examine this project and evaluate it from the point of view of its interest to technological research; policy instruments in this aspect should also support local universities, industrial enterprises and consulting engineering firms, in projects that have the potential to increase production, industrial integration and the regional technological content of the industry under review.

e) Standardization of quality

The establishment of quality standards for metallomechanical production is another necessary instrument to secure quality for consumers and, in certain cases, the possibility of interchanging parts; the studies consulted for the preparation of this report, in addition to indicating this need, underline the fact that not even the companies themselves, with very few exceptions, have quality control facilities. The integration that has been suggested in the production inputs and parts for some capital goods underlines the importance attaching to standardization. As it has done in other sectors of production, the Central American Institute for Research and Industrial Technology, could plan a salient role in promoting studies and in adopting quality standards.

4/ See, Investigación y desarrollo de la industria de implementos y máquinas agrícolas en Centroamérica, op. cit.

/f) Preparation

f) Preparation of studies

Besides the specific studies previously suggested, others should be carried out in the following fields at least:

i) Basic information on demand at the macro and microeconomic levels of the products of the capital goods industry;

ii) Inventory of machine tools processing plant in the region and its characteristics, with a view to organizing cooperative machinery manufacturing activities among companies;

iii) Identification and formulation of specific investment projects or metallomechanical capital goods complexes; and

iv) Evaluation of public sector purchases and analysis of the regulations in force in this respect, especially for electrification and agricultural production promotion institutes, where acquisitions might have the potential to support the development of the capital goods industry.

g) Joint planning and promotion of industries

It is considered that the policy for the capital goods industry and its metallomechanical inputs contained in the instruments proposed for regional action in this sector, could not yield practical results of importance in terms of a rational increase of production and strengthening of inter-industrial relations if it were not based on some operative mechanism of joint programming and promotion of the corresponding industries. The material collected to prepare this report suggests that such industries could be selected for incorporation into the Industrial Development Consultative System recommended by the Economic Cooperation Committee of the Central American Isthmus at its tenth session (resolution CCE/X/155).[5/] Following this system, a committee on capital goods and their direct inputs could be set up, consisting of representatives of Government and private enterprise as well

5/ See El sistema consultivo de desarrollo industrial regional y el apoyo a los organismos regionales de integración (The Consultative System on Regional Industrial Development and Support for Regional Integration Organizations),(E/ECLA/CCE/372).

/as of

as of technicians from the Central American economic integration organizations. Among the activities of such a committee would be that of suggesting to high-level authorities the negotiation of policy and promotion agreements pertinent to such industrial activity, which would be based on the industrial regional planning to be undertaken by a permanent technical group composed of a multidisciplinary team of national and international experts.

h) Technical assistance

Technical assistance is considered necessary for the development of these industries in fields such as training of skilled personnel, establishment of quality standards, productivity, production methods and processes, product design and company organization. Some national and regional organizations could include in their programmes the responsibility to offer and channel, as the case may be, technical assistance to industrial enterprises. In many cases they should be provided with technical advice to enable them to perform these functions. The help of international technical assistance experts would also be essential in order to facilitate the formulation of the other policy instruments.

## 2. Areas of international cooperation

The backward condition of the Central American capital goods and intermediate metallomechanical industry makes international cooperation an essential element to stimulate its development through technical and financial assistance, and the transfer of technology under the proper conditions. With the experience gained in other industrial sectors in the region, it may be possible in future to ensure that international cooperation is not subject to the restrictions that have

obstructed it in the past, especially as regards financial and technical aid. Among the specific areas in which it might be desirable to develop international cooperation in relation to the industrial activities mentioned above, the following are underlined:

- Financial assistance as a complement to the regional investment and financing effort in respect of projects on production of capital goods and inputs. These projects need costly pre-investment studies, and investments and working capital that could not be supplied by local companies. If the assistance were to place more emphasis on the proposed projects at the regional level, support would be given to planning at the level of the selected industries and, therefore, to the integration process.

- International cooperation on programmes and projects for education and training of human resources, as well as the granting of training fellowships to their graduates (with the implicit cooperation of companies and research centres in industrialized countries). Such help could strengthen the supply of skilled workers and engineers and technicians in the different fields of specialization that these types of industries demand.

- Cooperation in carrying out technological research and development programmes and projects, in establishing quality standards and in the creation of quality control facilities for metallomechanical products. Within this area are the programmes of the region's scientific and technological institutes, those of some universities and a project to create an Institute of Agricultural Machinery and Equipment.

- Assistance to reinforce the resources devoted to undertaking studies on planning and industrial pre- vestment in the field of the corresponding capital goods and inputs, as well as the necessary studies on the revision of the common external tariff system.

/ - Cooperation

- Cooperation to establish an Industrial Development Consultative System (creation of the Capital Goods Consultative Committee and Technical Group).

- Cooperation to mobilize external technology and know-how towards Central American companies in this field, that could enable them to improve their present organization and management systems. Programmes must be included here that are aimed at improving efficiency and productivity.

- Cooperation through agreements to suppress restrictions on financial and technological assistance, such as those that preclude the promotion of exports from the region to other countries, developed or developing.

- Agreements on technological cooperation to establish joint ventures in specific activities for capital goods production.

- Regional cooperation agreements with other countries to complement productive capacities and to promote joint investment projects.

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