3.2 Current Situation of Sub-sectors

3.2.1 Agricultural Machinery Sector

(1) Agriculture in Colombia

Although a share of agriculture in GNP dropped from 23.1% in 1970 - 1975 period to 21.5% during 1980 - 1985 (Table 3.19), it still maintained a significant share above 20% together with the manufacturing industry which share also exceeded 20%.

Figure 3.16 summarizes trends in agricultural production as a whole and production other than coffee which are indicated in 1975 prices. Between 1970 and 1981, overall agricultural production increased because of steady rise in coffee prices, but after 1982, it has remained sluggish as being affected by low coffee prices.

As analyzed in detail later, the sluggish agricultural production has been affecting agricultural machinery demand.

The main agricultural product in Colombia is coffee, accounting for about 13% of worldwide production to rank the second, next to Brazil who holds a 30% share.

The share of coffee exports in the country's total export value rose from 44% in 1975 to 62% in 1980. Since then, the share has remained at 60% levels, as exports of other products also grew steadily. Today, the annual coffee export is estimated at US$1.6 billion to US$1.7 billion.

Coffee production in Colombia is considered to directly or indirectly support livelihood of 5 million population, which account for approximately one-fifth of the total population.

Colombia is also a major producer of sugar canes, raw cotton, beans and fruits, reflecting her long-standing history in agriculture.

A majority of farms are operated in the form of plantation which adopts large-scale and mechanized cultivation practices as seen in the U.S. Some of them are very large and directly import agricultural machinery by using foreign currencies earned through exports of own products. The remainders are small-scale farms which cannot afford agricultural machinery, thus using cattle and horses for cultivation.

(2) Current situation of agricultural machinery industry in Colombia

1) General

Of all types of agricultural machinery used in Colombia, large and high-performance machinery such as tractors and combines are all imported, not manufactured or assembled locally. So far, various government institutions and private companies have examined feasibility to foster domestic production, they concluded that the domestic market was not large enough to support the domestic production, while exports would not be feasible due to lack of competitiveness in terms of technology and prices. Nevertheless, domestic production of tractors is considered to be one of national objectives with high priority in order to secure abundant supply of agricultural products at economical prices as well as to export them in competitive prices, and to foster growth of metalworking and machinery industries.

Agricultural machinery produced domestically at present are thresher, coffee pulpers, sowing machines, sprinklers, agricultural chemical and fertilizer sprinklers, and implements for tractors. It took considerable effort for the industry to develop present supply capabilities which not only

satisfy the domestic demand but export some of them, although it is small quantities. However, most of the products are copies of foreign-made machinery without licensing and have many problems related to material, quality control, rationalization and product improvement, thus it is required to introduce sophisticated technologies from other countries.

There are about 40 manufacturers of agricultural machinery and the total employment is estimated to be slightly above 3,000 persons. The companies are located throughout the country, including Bogota, Cali, Bucaramanga and Palmira.

Table 3.20 shows major agricultural machinery manufacturers and their products.

2) Tractors

Tractor demand by power range in Colombia is between 15 HP and 200 HP, with predominant demand being found in 70 HP to 80 HP models. Sugar cane farms are mainly using large tractors with output of more than 150 HP.

Domestic production of tractors is considered to be feasible in terms of technological capability as the country produces motor vehicles, provided that cooperation from foreign companies can be obtained. The government intended to start domestic production of agricultural machinery at the time of starting automobile assembly operations in the country, and has requested support from foreign agricultural machinery makers.

However, a joint study with several foreign makers indicated lack of feasibility as tractor demand in the country was relatively small, at 1,000-unit level a year, while the demand would be diverse in terms of horsepower to prohibit economy of scale from being realized. The study estimated that the

minimum required market size would be 10,000 units annually. Currently, the high-performance tractors are imported from the U.S., the U.K., Japan, and Brazil, and there are import agencies and dealership network for each maker to fully support customers, including after-sale services.

In addition, there are some sugar processing firms who import tractors directly and lent them to farmers.

Various implements for tractors including spades are manufactured domestically, as listed in item 8).

Figure 3.17 shows the number of tractors owned. It peaked at 29,000 units in 1982 and decreased since then. However this is because the statistics does not include tractors which have passed more than 15 years after the original purchase. Actually, these relatively old models continue to be used more than 15 years through repair, so the actual number of tractors owned is estimated to be around 28,000 units.

Figure 3.18 shows the number of tractors imported. It recorded a 3,500-unit level in 1978 and decreased since then to remain at a 1,000-unit level at present.

The reason for this decrease in tractor imports despite of steady demand will be discussed in detail later, but one of main reasons seems to be the rise in peso-denominated tractor price due to the depreciation of the peso against foreign currencies, as shown in Table 3.21.

3) Combines

All combines used in the country are imported. Since the price is very high (approximately 25 million pesos) to require at least 2,000 ha of land

to operate the combine on a profitable basis, only 40 to 50 units were imported by large farms in 1987 - 1988.

Figure 3.19 shows the number of combines owned. There were about 1,700 units in 1978, which decreased to less than 1,000 units after 1986.

Figure 3.20 shows the number of combines imported. In 1975, about 250 units were imported, then down to about 50 units in 1986 - 1987.

4) Harvesters

Harvesters are all imported, with annual import trends being shown in table 3.22.

In 1988, 11 million pesos worth of harvesters were imported. Although the import has fluctuated each year due to occasional import restrictions, it is generally on the increasing trend.

Harvesters imported earlier had relatively poor performance, with service life of less than 5 years. However, recent machines have been improved and are serviceable for more than 10 years, and the demand is expected to grow steadily.

5) Threshers

Table 3.23 shows domestic production, export and import of threshers.

In 1987, 71 threshers were manufactured domestically, equivalent to US$30 million in the total value. Most of these machines are custom made and thus are relatively costly.

The country has been exporting threshers for coffee and rice since 1984, and the export value reached US$1.5 million in 1988. On the other hand, the import started in 1986, and the value grew to US$35

million in 1988.

6) Coffee pulper

Coffee pulpers are manufactured domestically as shown in Table 3.24. The production fluctuates with changes in coffee production, but it has been generally on the increasing trend since 1984, reaching 12,380 units in 1987, or 380,000 pesos in value.

Import and export data on coffee pulpers are not available as there are no tariff codes nor INCOMEX data on this machinery.

7) Sowing machines

About 80% is said to be manufactured domestically. However, exact production figures are unknown because no data are available at DANE.

Sowing machines are exported and imported as shown in Table 3.25. Because the tariff rate is low, the import has increased since 1984, reaching US$1.45 million in 1988.

The export reached its peak at US$120,000 in 1986 and has decreased since then.

8) Implements for tractors

Implements for tractors, including spare parts, are manufactured in sizable quantities throughout the country. There are more than 20 companies to manufacture them for tractors, both for new and existing models. Some of these makers are listed in Table 3.20. Nevertheless, these makers manufacture similar products and are engaged in excess price competition. Although they have potential to develop into an export industry, extensive improvements including the upgrading of production lines are required before then.

Companies which the study team visited have a wide range of machine tools including lathes, milling machines, shearing machines, hydraulic presses, welding machines, and painting equipment, and are considered as the first level facilities in Colombia. However, they do not have systemized production lines nor NC machines and have many problems including low capacity utilization rate at an average of 60% per shift.

About 80% of implements are produced domestically. Generally, hot rolled steel plates, forged steels, springs, hydraulic pumps, gears, and universal joints are mostly imported.

(3) Problems viewed by agricultural machinery users

Colombia is traditionally an agricultural country and there is large demand for agricultural machinery. In practice, however, small farms still use simple agricultural implements as well as cattle and horses for cultivation.

The following are possible reasons why agricultural machinery is not widely used as expected.

1) High price

Major users of agricultural machinery are large farms. On the other hand, small farms cannot afford to get agricultural machinery because of high price comparing to their low yield.

2) Difficulty of access to low-interest credit

Fondo Financiero Agropecuario (Financial Fund for Agriculture and Livestock) is operated to provide a credit line from the central bank. The fund can be used for the purchase of agricultural machinery, and the interest is relatively low, at about 30% annually subject to weekly changes. Actually,

however, not enough funds are available, and loan application is very cumbersome for small farms to use the credit service.

3) Sluggish agricultural production

Uncertainties in future agricultural production discourage small farms to use long-term loans.

4) Threat of guerrilla attack

Small farms, not capable of defending themselves, are often attacked by guerrillas who steal farming tools and products. Some farmers cannot continue farming and migrate to cities to find jobs.

(4) Problems related to domestic production of agricultural machinery

1) While tariff rates on agricultural machinery is very low to promote agriculture, those on materials and components for production of agricultural machinery are high. Thus it is more economical to import agricultural machinery in terms of import duties. The protective tariff for domestic production of agricultural machinery is -8%.

2) Farms, users of agricultural machinery, have foreign currencies from exports of their own agricultural products, and are therefore in a favorable position to import agricultural machinery.

3) The domestic market for agricultural machinery is small and cannot support domestic production.

4) Although some of agricultural machinery have been exported, it has not grown favorably due to problems related to technical levels and production costs.
Thus, Colombia faces a dilemma that, despite the large domestic demand for agricultural machinery, the actual market remains small. The reason for

this may be summarized as follows:

High prices -> Only large farmers can afford -> Small domestic market -> Mass production not feasible -> Rationalization of production facilities and setting of production line not feasible -> Prices remain expensive

This problem cannot be solved only by a commercial approach. If the current situation continues, Colombia's agriculture will be further left behind international levels of productivity and price competitiveness. Thus, the study team would propose to include domestic production of tractors as part of a scheme for domestic production of construction equipment. This way, tractor production can be promoted as one of national projects.

First of all, it is recommended to limit models to three horsepower types, with design to allow interchangeability between agricultural machinery and construction equipment by changing attachments.

In addition, the following measurers are considered to be effective:

a) To develop effective measures to attract foreign investment.

b) To foster tractor assembly businesses.

c) To establish a system to supply parts and raw materials for domestic production.

d) To organize small farms into cooperatives to promote communal use of small tractors.

e) To promote development of domestic steel industry to ensure stable quality, prices, and delivery schedule.

f) To establish model farms.

3.2.2 Construction Equipment

(1) Supply and demand

The construction industry continues to grow annually as shown in Table 3.26 on the basis of 1975 prices. Although its share of GDP varies each year, it was 3.5% in the 1970s, but surpassed 4% in 1980. Construction accounts for 48% of the capital formation (made up of 35% machinery and 17% road construction and irrigation), 10% of employment and 8% of wages and salaries.

In order to promote housing construction, the government introduced UPAC (a system to encourage savings for housing construction by maintaining the interest higher than the inflation rate).

Construction work is divided into commercial and industrial building and housing construction which accout for 37% and public works 63%.

There are about 5,000 construction companies throughout the country. Among them are about 80 major companies engaged in highway construction. One company is a large enterprise and the rest of companies are much smaller. This large enterprise, however, is under liquidation at present.

Not much construction equipment is used in housing construction and a large scope of public works also depend on manual labor, and much of the demand for construction equipment depend on public works by the government.

Previously, the central government controlled construction equipment, and handled the purchase, custody, and lending of machinery, but recently, the autonomy of the municipalities was recognized by the amend-

ments of the Autonomy Law, authorizing the purchase, custody, and lending of machinery by the municipalities, resulting in an upward trend of demand. Also, business for urban development, public works, coal mining, mineral exploration, etc. have increased and the demand is headed for a steady growth. The total demand at present was about 800 units in 1988 and is expected to triple or quadruple in the next several years. There is no assembly plant for construction equipment in the country and all of the equipment are imported. When imported, only road rollers require preliminary examination and the rest can be imported freely.

The number of units owned in the market at present is estimated to be about 20,000 units and the annual imports are estimated to be about 60 - 70% of the imports applied for. The number of units, which import application was made to INCOMEX, and actual imports are shown in Table 3.27. Import application reached a peak of 1,200 units for all types in fiscal 1983 and declined by half to 550 units in 1984, but this was due to the excess applications in the previous year, and there was an upward trend since then, reaching 1,400 units in 1987.

Construction equipment imported in 1988 were as follows:

1) Excavators	237
2) Bulldozers	182
3) Backhoe loaders	131
4) Wheel loaders	106
5) Motor graders	93
6) Road rollers	64

The main exporting countries are U.S., U.K., Brazil, Japan, Belgium, France, Italy, Sweden and West Germany. Mainly imported are two types of equipment, backhoe loaders and excavators. The outputs of the engines are of a broad range from 20 to 200HP, but the largest demand is for around 70 - 160HP. Also, the

volume of the bucket of 0.7 - 1 cubic meters are in the most demand.

Most of the demand is mainly by the governmental organizations, but there is a demand in the private sector for backhoe loaders, excavators, wheel loaders, etc. and demands from the mining and the agricultural sectors are expected.

As new equipment are costly there is a strong demand for used equipment. There is a difficulty to purchase excavators, bulldozers, etc., even used ones. On the other hand, the lease business is growing in importance and is on an upward trend, and about 70% of the pesos-based business is in the form of lease.

There are many smuggled spare parts, and therefore the sales by the legal agents are about 10% or less of the market.

(2) Production

As construction equipment is a free import item, there is no assembly production in the country. There is only one company registered as an excavator manufacturing factory, but it fits implements to agricultural tractors and does not produce excavators.

Although various parts and accessories are locally manufactured, they are all small items, and the large ones depend on imports.

There is no plan for CKD assembly production by joint venture or technical tie-ups with foreign makers, but as the demand is expected to grow in the future, assembly production under the CKD system may become feasible. In this case, it becomes an important policy to promote small and medium scale enterprises to manufacture parts as the demand for spare parts will increase.

In the case of construction equipment in general, the

operation mainly involves plate work, welding, assembly, and general machined parts, etc., when the engines, the large press parts, hydraulic drive apparatus and the large castings and forged parts are excluded, and about 40 - 50% on a value basis can be produced domestically. The parts that can be produced domestically are shown in Table 3.28.

(3) Imports and exports

The total demand for construction equipment depends on imports. Trends in exports and imports are shown in Table 3.29.

With the increasing demand for urban development and public works, etc., the demand for construction equipment such as bulldozers, excavators, etc. will grow and in terms of total import value approximately tripled from 1984 to 1988. Construction equipment is a free import item and INCOMEX has set forth an import quota of US$30 million per month for such equipment including agricultural equipment.

The import tariff rate is 5% of the CIF price for free import items and 10% for preliminary examination items, and furthermore, ad valorem tax of 18% and a value added tax of 10% are imposed.

3.2.3 Machine Tools

Machine tools herein discussed include hydraulic and mechanical presses, shearing machines, and press brakes, which are metal forming machines in addition to metal cutting type machine tools.

(1) Lathes

Table 3.30 shows production of lathes in Colombia between 1980 and 1987. As seen in the table, the production of lathes has decreased since 1982. This is because a knock-down assembly plant terminated operation in 1980 due to unsuccessful business. The plant started operation in 1970 to assemble lathes using imported parts for exports to countries in ANDEAN group and Latin American Free Trade Association (ALALC). Since then, no other makers have been successful in manufacturing of lathes.

Although three companies are registered with INCOMEX as general-purpose lathe manufacturers - listed in Table 3.31, none has been produced in the past 4 years. Thus, it appears that the number of second-hand lathes traded has been recorded as production after 1982. Today, Colombia does not produce general-purpose lathes or any other type.

Tables 3.32 and 3.33 show actual imports and exports of lathes between 1984 and 1989.

These tables indicate that, general-purpose lathes are mostly imported, followed by automatic lathes. The import value varied greatly with years, with rapid increase being observed after 1986.

The export appears to be parts for previously exported lathes.

(2) Drilling machines

Table 3.34 shows production of drilling machines in Colombia between 1980 and 1987, and year-end inventory between 1984 and 1987.

Table 3.35 shows imports of drilling machines between 1984 and 1989.

Increase in the number of drilling machines in inventory between 1984 and 1987 indicates that the production surpassed the demand. On the other hand, no export was made, whereas the import still continues as shown in Table 3.35. This suggests that drilling machines made in Colombia do not have competitiveness for exports.

There are 8 companies registered with INCOMEX as bench drilling machine makers, but only a few of them are actually engaged in production. The total production capacity of the makers amounted to about 250 units a year. The demand is estimated to grow at an annual rate of 8%. Table 3.36 lists the drilling machine makers.

Nationalization rate of drilling machines is very high; only bearings are imported. It should be noted, however, that rolled carbon steels are imported as a raw material.

(3) Shearing machines

Table 3.37 shows production of shearing machines between 1980 and 1987 in Colombia, which include sawing machines. Production trends are similar to those for drilling machines. Rapid increase in production occurred from 1984 and inventory rose; growth rates from 1984 to 1987 were 37%, 47%, 30%, and 12% respectively.

There are 4 companies registered with INCOMEX as shearing machine makers. However none of the companies have not manufactured shearing machines. Therefore, production figures listed in Table 3.37 seem to represent sawing machines and second-hand shearing machines.

Table 3.38 lists the shearing machine makers.

Table 3.39 shows imports of shearing machines between 1984 and 1989. Although the figures include sawing

machines, it appears shearing machines accounted for the most. As seen from the table, shearing machines have been imported at a stable rate since 1986.
Since shearing machines are similar to press brakes, which are described in (6), it is desirable that these machines are manufactured by same companies.

(4) Milling machines

According to the data provided by INCOMEX, 20 milling machines are produced each year, but these figures appear to represent import sales of second-hand machines or KD production.

Two companies are registered with INCOMEX as milling machine makers, but they are not manufacturing the machines.

Table 3.40 shows imports of milling machines taken place between 1984 and 1989. The table clearly indicates that Colombia has been importing relatively a large number of milling machines, second only to lathes.

Table 3.41 lists the milling machine makers.

(5) Grinding machines

No grinding machines are produced in Colombia.

Table 3.42 shows imports of grinding machines between 1984 and 1989, which include those for tools and cutters.

(6) Bending machines

Table 3.43 shows production of bending machines between 1980 and 1987.

One company is registered with INCOMEX as a bending machine maker, and the company manufactures one press brake per month. Table 3.44 lists the maker.

Table 3.45 shows imports of bending machines from 1984 to 1989, which include cold roll forming machines. Table 3.46 shows exports of bending machines between 1984 and 1989, which were made by the registered maker by using "Plan Vallejo".

"Plan Vallejo" is a system designed to promote exports by Colombian companies, under which all parts for machines to be exported can be imported free of tax, and subsidy is granted by the government as assessed on the basis of value added during the process of production.

(7) Hydraulic and mechanical presses

Up to 200-ton hydraulic presses are produced domestically. Approximately ten sets of presses of 100-ton type are produced annually.

Table 3.47 shows production of hydraulic presses between 1980 and 1987. US$112,211 worth (FOB basis) of hydraulic presses were imported in 1987 (according to data furnished by INCOMEX).

Two to three mechanical presses are manufactured every month. There are no statistics available, but our interview with the companies indicates that most of mechanical presses used in the country are imported. The number of units appears to be similar to the number of bench drilling machines. In 1987, US$314,822 worth of mechanical presses were imported (according to data furnished by INCOMEX).

Table 3.48 lists the hydraulic press makers.

As clearly seen in the above analysis that was made on the basis of statistical data available, Colombia imports most of machine tools used, from a variety of countries including Japan, Brazil, Taiwan, Spain, and Eastern Europe.

Numerically controlled machine tools are mainly imported

from Japan, drilling machines from Taiwan, and lathes and milling machines from Spain, Brazil, and Eastern Europe. Mechanical presses, press brakes and shearing machines are mainly imported from Spain and Eastern Europe.

Only bench drilling machines are said to be domestically manufactured, and considering they are of simple construction, effort should be made toward domestic production of machine tools with higher performance and quality.

As for major parts for domestically produced machines, cast iron is manufactured domestically, but steel plates for frames and round bars for shafts are all imported. Hydraulic equipment is available in the country but is all imported from abroad.

All machine tools makers in Colombia are of small- or medium-scale and need technological and/or financial supports for modernization.

Major problems related to the machine tools industry in Colombia are summarized as follows:

1) Small market size
2) Poor qualities due to non-adoption of international standards
3) Lack of international competitiveness in terms of price
4) Obsolete technological resource compared with other Latin American countries
5) Lack of effective technical assistance
6) Lack of government's effort and policy to foster the machine tools industry

Without any doubt, future development of the machine tools industry in Colombia hinges on whether the above problems can be effectively solved. At the same time, improvement of production technology in the whole metalworking industry is expected to play a critical role. For example, one of the automobile manufacturers launched a program to change general-purpose machine tools to NC tools a few years ago. If these endeavors spread to other areas in the metalworking industry, the machine tools industry will

have a bright future ahead.

3.2.4 Transportation Equipment Industry

(1) Automobiles

1) Use of automobiles and the market

Table 3.49 shows the automobile registrations for all types. According to the table, as of the end of 1987, there were 1,300,000 units registered, 61,000 units produced and 12,000 units planned for import and as of the end of 1988, the number of automobiles registered increased to 1,370,000 units. When the number of units taken out of service is considered, the number would be much smaller. According to Table 3.50, 80% is owned privately, 18% is owned by public institutions, and 2% by government agencies; and by regions, many are in Cundinamarca (40%), Antioquia (15%), Valle (12%), the three regions totaling 67%. As shown in this table, many of the automobiles in service are used cars, signifying that there is a large demand for spare parts and components as well as for repair service. There is concern, however, over the safety of vehicles as vehicles obviously of poor maintenance are in use.

As for public transport services, in addition to airlines and railroads between cities, buses and taxis are available, and the role of automobiles is important. In the case of passenger automobiles, however, the price of a new automobile costs at least 3 to 4 million pesos at present as shown in Table 3.51, while the per capita national income for fiscal 1986 was US$1,200 (252,000 pesos), and therefore, ordinary people cannot afford new automobiles and much of the demand for new automobiles is limited to the affluent class which accounts for only about 5% of the population.

It is said that the affluent class which can afford new automobiles has not increased during the past several years. With the progress of the economic environment in resent years, the demand for light vehicles has increased, but the general demand is directed to the used automobiles market. The prices of the used automobiles are in the range of 1,000,000 to 2,000,000 pesos for around 10 years old models.

The supply of new automobiles is shown in Table 3.52. The demands for new automobiles in 1981 and 1982 were close to 70,000 units, but declined to 50,000 units or less in 1983 through 1986 owing to the devaluation of pesos and then increased since 1987 and recovered the 1981 level in 1988. Of the demand, the nationalization rate was 60% or less during 1981 to 1983, but reached 90% in 1984 which has continued to present, with a production in 1988 of about 60,000 units.

The automobile demand in Colombia has been closely related to growth of domestic economy. For instance, if present prices of automobiles drop by 30%, the demand will increase from 60,000 to 85,000 units. Nevertheless, under optimistic assumptions that a 30% drop of automobile prices and a 5% growth of Colombian economy are achieved, the demand is not likely to exceed 180,000 units by 2000. This means a fairly small automobile market compared to other countries.

As the automobile production capacity is said to be 84,000 units per year, the capacity utilization rate in 1988 turns out to be around 73%. The increase in the nationalization rate since 1984 is due to the strengthening of import restriction. Since then, however, exceptional imports for special vehicles such as police cars, ambulances, etc. and imports of complete cars from West Germany by barter trade in exchange for coffee have been approved. The tariff rates levied on imports of

complete automobiles are as follows.

Passenger automobiles		200%
Jeeps	60%	200%
	(without Cabin)	(with Cabin)
Pickups/Trucks (less than 10,000 lbs)		100%
Trucks (10,000 lbs or more)		25%

According to the ACOLFA data on the demand for new automobiles by type, there was a gradual decline in the demand for medium-sized cars since 1983, a gradual increase in the demand for small cars since 1985 and a further increase in 1987 with the lifting of price control. According to the statistics of INCOMEX, the demand for automobiles by type is divided into 13% for small cars, 58% for medium-sized cars, 10% for jeeps, 10% for pickups, and 9% for commercial trucks and buses, the passenger automobiles accounting for 71%.

Generally the demand of trucks follows the gross national production, however it has been sluggish in the recent years. Comparing to prices of trucks in other countries, it is rather higher; for instance the price of pick-up is 92% higher than that in the U.S., partly due to higher tax (33%) and the price of large trucks is 20% higher than that in the U.S. On the other hand, the demand for buses has decreased from 3000 units per year to 1000 units, which is owing to the reduction of profitability.

Thus, potential demand for new automobiles is considered to be high but is limited under the present circumstances. It is conceivable that the demand will increase with the rise of the income level, the equitable distribution of income, reduction of automobiles prices, the development of lease business for automobiles, the development of the transportation business, the improvement of highway systems and overall nationalization of the

transportation industry. These factors will improve the efficiency of the new automobile production and stimulate the sluggish demand. In this conjunction, the supply side is expected to ensure safety of automobiles. Development of the standards of strength and establishment of the vehicle inspection system are necessary.

2) Production

a) History of development

Domestic production of automobiles started in the 1960s, expanded rapidly in the 1970s, and reached 36,000 units in 1981. Since then, there were violent fluctuations in the domestic production due to the domestic demand and import restrictions, and the production was in the range of 30,000 to 60,000 units per year since 1980. In 1956, Austin and Chrysler entered into automobile production and formed COLMOTORES, and in 1960 Willys and Fiat formed LEONIDAS LARA E HIJOS, the two companies producing an average of 3,200 units per year of trucks and jeeps at CKD.

The assembling industries to be developed were designated by Decree No. 1143 of 1969, establishing the goal of nationalization of automobile parts and components and penalty provisions for defaulting were established by Decree No. 1916 of 1970.

In 1970, Renault established SOFASA and constructed an engine factory with a capacity of 20,000 units per year and a vehicle assembly factory with a capacity of 15,000 units per year. In 1975, LEONIDAS LARA E HIJOS suspended operation and produced Fiats as COMPANIA COLOMBIANA AUTOMOTRIZ (C.C.A.), but as Mazda of Japan entered in 1983, their production was switched to the Mazda line vehicles. In 1979, Chrysler withdrew from COLMOTORES and General Motors

entered in its place and has been in operation to present.

In the 1980s, there were import restrictions, changes in government policies and agreements, and this was an unstable era for the factory operation.

To encourage the assembly industry, the government enforced the regulation concerning the assembly industry by Decree No. 3218 of 1983 and designated the Industry and Commerce Superintendence as the implementing agency. By this decree, three companies listed below were designated as the assembly industry in the automobile industry and new enterprises other than the three were disapproved. The enterprises approved were the following three companies:

COLMOTORES	: GM line vehicles, ISUZU, SUZUKI
C.C.A.	: MAZDA line vehicles, Mitsubishi jeeps
SOFASA	: RENAULT line vehicles

The contents of the agreement between the assembly companies and the government as of December, 1988 were as follows:

- Approval of at least the assembly of 3 models of passenger automobiles and the assembly of jeeps, commercial vehicles (trucks, pickups, buses and derived cars)

- Possibility of formation of a separate company for entry into the automobile parts and components industry approved by the Ministry of Economic Development.

- Production and sales plan for at least a five year period and the spare parts and components supply plan for the next ten years.

- The assembling enterprises to behave in accordance with the nationalization standards set forth by the Ministry of Economic Development and to establish the technical support system, the assembling enterprises to organize jointly the homologation center in order to promote the automobile parts and components industry and furthermore the assembling enterprises to contribute 3% of the CKD import value for light vehicles and 2% of the CKD import value for heavy vehicles as "Automobile Industry Suppliers' Fund" (Fondo de Proveedores de la Industria Automotriz).

- To export automobile parts and components or complete automobiles at the annual rates of 8% of the CKD import value in 1988 - 1990, 11% in 1991 - 1993, and 15% in 1994 - 1997.

Thus, the three companies approved as the assembly industry are required to ensure technology transfer from abroad, to gradually increase parts and components procured domestically in the assembly and to carry out exports by stages, but as the number of the assembling enterprises is restricted, there are various benefits;excessive competition can be avoided; a constant market can be secured; they can be treated as domestic manufacturers; and can enjoy numerous benefits in the administrative
contracts with the government organization, and can receive favorable treatment in tariff against imports of complete products.

The automobile industry is an integrated technology-intensive industry having extensive linkage to related industries. As an example, the composition of the automobile industry is shown in Table 3.53. In general, the automobile industry adopts a specialization system and the assembling enterprises produce important parts and components in-house, subcontract general

components to specialized suppliers, and subcontract other assembly parts and components to outside manufacturers. The assembling enterprises constantly strive to maintain the quality of the subcontracted products to match the in-house products. By the production of parts and components by specialization, unnecessary investment can be evaded, the productivity improved and the cost reduced, generating market competitiveness of the commodity as a whole. This is why the industry is called the linkage type industry.

b) Production capacity and records of production and sales

As mentioned previously, there are at present three automobile assembly factories approved and they engage only in the assembly operation of automobiles under the assembly agreement with the government. The enterprises can not produce parts and components in-house under the agreement. In other words, all parts and components needed for the assembly consist of the domestic products manufactured by the domestic suppliers and imported parts by CKD. An exception is SOFASA, which is authorized to produce parts and components in-house because they constructed the engine production plant at the time of founding and conduct machining of the parts and components.

Three types of automobiles are manufactured; passenger automobiles, jeeps and commercial vehicles, and those in short supply are supplemented by imports. The production capacity and the outline of each assembling enterprise are shown in Table 3.54. The combined total production capacity is 84,000 units, the annual production 61,000 units and the capacity utilization rate is 73%.

Looking at production of automobiles during the past several years by models, Table 3.55 shows that there were a great number of models, 39 models for production of 60,000 units in 1988. The production plan for the next three years approved by the government amounts to 100,000 units and 55 models, as shown in Table 3.56. The diversification of product line is one method of developing demand, but within the limited number produced, even derived models lead to multiproduct-small lot production, which is not desirable in terms of production efficiency. Therefore, it is necessary to minimize the number of models, to improve the production efficiency, to reduce the cost and to meet the demand of the market.

As shown in Table 3.57, although the number of enterprises and workers of the entire manufacturing industry vary by the fiscal year, there were 6,972 enterprises and 480,000 workers in 1987, of which the automobile related industry (CIIU 3843) accounted for 155 enterprises and 14,000 workers, or 2.2% and 2.8% respectively.

c) Manufacturing cost

The price of the complete automobile assembled within the country is said to be about 50% higher compared to the CIF price of the imported complete automobile. The nationalization rates of the parts and components of the complete automobile are said to be about 20% for trucks, about 30 - 40% for pickups, jeeps, etc., 40 - 50% for small cars of 1,500cc or less, and 30 - 40% for medium-sized cars of 1,500cc or more, but their ratios to the production cost are roughly given below. The materials imported by CKD account for about 31%, the materials imported for processing account for 8%, the domestically produced materials account for 7%, and the taxes account for 17%, their combined total

accounting for 63%. The balance after deducting 7% for freight or 30% is made up of the processing cost (10%) and the administration expenses (20%). Moreover, the value added of the domestic automobile industry is very low, the parts and components production accounting for 6% and the assembly accounting for 4% of the processing cost.

Import duties on automobile parts and components are 30% on hydraulic buffers and 10% on all others, while those on raw materials for automobile parts and components production are of high rates of 25% on hot rolled steel sheets, shaped steel and bar steel, and 40% on gaskets, rubber tubes, etc. This is designed to protect domestic production of raw materials but the high cost of raw materials constitutes an inhibiting factor in the domestic production of automobile parts.

d) Nationalization of parts and components

When a supplier is successful in the domestic production, it submits application "CE-200" to the Industry and Commerce Superintendence for approval. When the application is accepted by the Industry and Commerce Superintendence, imports are restricted and the assembling enterprises are required to use the domestic products. Thus, the supplier will monopolize the market of the particular parts and components unless a competitor emerges in the domestic market.

The definition of domestic parts and components recognizes as a domestic product, any imported product if, on the basis of price, 25% of the product consists of domestic products, even if 75% of the product consists of imported products. Also, wages and salaries up to 10% is allowed in the domestic parts and components.

The automobile parts and components manufacturers are said to be 120 - 130, roughly the top ten supplying about 80% of the demand of the parts and components for new automobiles. The number of workers engaged in parts and components manufacture is about 10,000 and accounts for about 77% of all the workers engaged in the automobile industry. The production value of tires and wheels accounts for a large share of about 28% of the production value of automobile parts and components. The production value of parts and components for new automobiles accounts for about 26%, that for the after-sale market accounts for 41%, and that for exports accounts for 5%. Large suppliers are few in number and have large sales volumes, supplying about 60% of their products to the assembling enterprises; while small scale enterprises are many with small sales, and most of the products are directed to the after-sale market.

The demand for automobile parts and components accounted for U.S. 862 million dollars n 1989, of which 62% were locally produced and 38% imported. Some 80% of the total were directed to the repairing market. Beside the above demand, a fair number of smuggled goods flew into the market.

The average breakdown of the manufacturing cost at the automobile parts and components manufacturers is 24% for imported raw materials, which amounts to 40% together with the tariff and freight, 24% for the domestic raw materials, 17% for the processing cost and 22% for the administrative expenses, indicating a low value added.

Parts and components that can be produced domestically now and those that have such possibility are shown in Table 3.58.

In either case, many are small parts components and there are few large ones, which results from the small size of the market and the avoidance of large investment in equipment. Also, while processing technologies are accumulated, the modernization has not advanced and the level of quality is low. In addition, they are not able to satisfy the level required by the assembling enterprises in terms of volume, price, etc. and in the present state they have not been able to gain the confidence of the assembling enterprises.

There is flexibility in the import policies of the government too and a tendency to relax in response to the actual state of the domestic production, and in reality there are imports of parts and components which are said to be possible to produce domestically. Observing domestic technological level such as casting, forging and machining, it would be possible to nationalize automobile components by establishment of appropriate assistance measures to promote further developing technologies and using quality materials, resulting in the contribution to export. Also, the large parts and components were excluded from the list of parts and components that can be produced domestically, but in any case, production technical assistance including modernization of the existing equipment are needed.

As many of medium and large scale enterprises received technical assistance from the industrialized countries, the level of the production equipment, production technology, production control, and other production aspects, is higher than that of the small and medium scale enterprises and the quality is stable. Therefore, they can supply parts to the assembling enterprises, but with respect to the small and medium scale enterprises in general, the modernization

of the production equipment, production technology, production control, and other production aspects are lagging far behind, and it is said that about 90% of claims in the automobile market involve domestic products and they are not able to gain the confidence of the assembling enterprises in quality, delivery and other aspects, and are merely engaged in spot production of spare parts and components for the after-sale market as demanded by the parts shops.

In general, as the automobile market is small and diverse and there is much smuggling of automobile parts and components, the domestic production results in a multi-variety small lot production at a low productivity, which restricts parts and components production. As there are a few competitors in each product, the market is a sellers' market and they think there is no need for investments, etc. in quality improvement, production rationalization, etc. when the market outlook is not bright. As a result, the equipment is deteriorated, the production technology remains obsolete, the productivity is low, the cost will not decrease, the quality accuracy is not improved, and the oligopoly alone proceeds, and the vitality of the market environment is lost. As the automobile market is small and the types are numerous, the production of parts and components cannot enjoy the economic scale to match the investment which leads to refraining from investment, and therefore, it is necessary that the equipment are made and advanced production technology carried out by the initiative of the government in such large scale investment as large scale presses, various die making equipment, casting, forging and heat treatment equipment, precision work equipment, precision measuring equipment, large scale molding equipment, etc. while technical guidance and production assistance are

rendered to educate the private enterprises and increase the nationalization rate of parts and components. Also, on the other hand, financial aid to vitalize the production activity is necessary and positive aid measures to encourage production of private enterprises such as a long term and low interest loan system for equipment investment and working capital, and lease systems for equipment modernization are necessary.

e) Imports and exports

Imports of complete automobiles are regulated at present, but as exceptions, imports of special vehicles such as police cars, ambulances and West German automobiles imported under barter trade of coffee, etc. are approved.

The number of complete automobiles by type imported under approval of the government is shown in Table 3.59 and the number of complete automobiles approved for imports and the actual number of units imported are shown in Table 3.60. The actual imports achieved a rate of an average 50% of the number of units approved, jeeps (light commercial vehicles), in particular, depended on imports from 1979 to 1987, but have moved to CKD production again since 1988 due to the strong demand. Prior to the import restriction, the ratio of imported vehicles was about 50%, but after the restriction, it was less than about 10%, and the demand for domestic automobiles increased. (Ref. Table 3.52)

It is possible to import automobile parts and components which are not produced domestically, and imports are restricted for those that can be produced domestically, but those of different specifications are approved upon application. All matters pertaining to permits and approvals for exports and imports are handled by the Foreign Trade Agency (INCOMEX), which examines the applications and issues import licenses. Also, the control of import restricted items is conducted by the Commerce and Industry Superintendence which will checks the actual condition according to the application and designate the product as domestically producible. These agencies are under the control of the Ministry of Economic Development.

The main products as CKD imported parts and components are engines, transmissions, suspensions, large press products, large forged products, electrical equipment and also spare parts and components for used automobiles. With respect to exports, they are advantageous in terms of labor cost but disadvantageous in terms of scale of production, and as a whole, an expansion cannot be expected because of the lack of competitiveness; which includes the improvement of quality, cost including freight, delivery schedule, technical capability, production technology, research facilities.

Imports related to automobiles in 1988 amounted to US$540 million, and exports amounted to US$20 million, main goods of which are tires, engine blocks and engine covers. The destinationwise export amounts, were US$6.6 million to Venezuela, US$3.4 million to France, US$2.7 million to U.S., US$1.7 million to Peru, US$1.3 million to Ecuador and US$1.3 million to Costa Rica.

Among the assembling enterprises, SOFASA is the only one that has a part and component process-

ing factory and exports parts related to engine and other parts in the amount of US$3.4 million.

(2) Motorcycles

1) Supply and demand

The precise number of vehicles owned in the country at present is not known but it is said to be around 300,000 units. They were hardly seen within the city of Bogota, but the demand for new vehicles is estimated to be about 20,000 - 30,000 units per year.

Since 1987, sales of motorcycles of 125cc or over have been restricted to only corporations. The present price is about 450,000 pesos or more and it seems that the growth of demand is low because it is high compared to the general level of income. But, as motorcycles are generally inexpensive and convenient and easy to be accepted as a means of transportation of high mobility, they have the possibility of a rapid growth in demand once the economic environment changes similarly as in the case of automobiles. At present the supply for new vehicles is about 20,000 units per year, and if the present economic environment continues and there is no sharp decline, an increase in growth of 10 - 15% per year may be projected.

2) Production and production capacity

As in the case of automobiles, the four companies listed below are approved in the motorcycle industry under the regulation governing the assembly industry according to the policy of the government to encourage the assembly industry.

INCOLMOTO : Yamaha Motorcycles
GEMELA : Suzuki Motorcycles
AUTECO : Kawasaki Motorcycles
FANALCA : Honda Motorcycles

These four companies are outlined in Table 3.61. The assembly companies are all associated with Japanese motorcycle manufacturers in a joint venture or in a technical tie-up and engage only in the assembly of complete vehicles using domestically produced parts and CKD imported parts and components, by introducing production equipment, production process, and production control technology from their partners. Vehicles manufactured by the companies are restricted to four types in terms of engine capacity up to 200cc and they are required to continue the production of the same model for four years. The production is shown in Table 3.62. In 1983, a total of 36,500 units was produced, but the production decreased thereafter falling to 18,000 units or less in 1986/1987. It has subsequently recovered but was only slightly over 22,000 units in 1988.

The current capacity utilization rate of the assembling enterprises is said to be about 35%. Most of the parts and components necessary for the assembly depend on CKD imports and the products of domestic production are batteries, seats, handle bars, emblems, sprockets, mirrors, winkers, stands, rubber products, carriers and other small parts, with a nationalization rate of about 5 - 10% in terms of value. The market size is about 20,000 - 30,000 units per year and considering that if each company produced the four types, the annual production per type would be 1,500 units or about 5,000 units per type at most. The scale of production would be small unless the demand grows and in addition, it is difficult to depend on the large scale enterprises for domestic production of parts and components in terms of investment efficiency and cost, because of the characteristics of motorcycles that the specifications vary by type with little interchangeability. The government gives strict administration guidances for nationalization of components, but it does not cover nationaliza-

tion ratios and limitation of time.
Thus, to promote domestic production of the parts, the improvement of the quality of the small and medium scale enterprises must be given priority. In other words, it is necessary to make it mandatory for the assembling enterprises to domestically produce the parts, by creating urgently the environment for technical assistance and renewal of equipment to improve the quality, delivery, price, etc. and by specifying the nationalization rate and the timing. It would be possible to domestically produce components except for high precision machinery part like engines by providing quality materials.

On the other hand also, it is said that the tariff rate on CKD imports of motorcycles is about 80% of the CIF value. It is possible to vitalize the motorcycle industry by reducing the tariff on the raw materials, increasing the value added by domestic production and to provide opportunity for reinvestment by accumulating the domestic capital.

3) Imports and exports

As the import of complete vehicles is restricted at present except for those for the government and public organizations, the parts and components excluding those that can be produced domestically are imported in the form of CKD. Imports on a unit basis by year are shown in Table 3.63. With respect to exports, expansion can not be expected because of the weak competitiveness in the international markets as described in the section on automobiles.

(3) Bicycles

1) Production

There are many enterprises that produce bicycles, mainly small scale enterprises, dispersed in each city. There are about 15 enterprises in Bogota. The recent trend in production is shown in Table 3.64.

Production of touring bicycles is stable at around 40,000 units per year, but production of racing bicycles which was 10,000 units in 1980 shows a decreasing trend and was less than 1,000 units in 1987. This is due to the flexible policy taken by the government on imports of racing bicycles to promote sports through bicycles.

The assembly consists of domestic parts and imported parts, and the ratio of the domestic products averages about 70%. The main items are frames, brakes, hubs, pedals, wheels, seats, handles, tires and small parts. Import of parts that can be produced domestically is restricted.

2) Imports and exports

Imports and exports are shown in Table 3.65. There were imports of a little less than US$240,000 in 1986, which decreased to US$560,000 in 1988. It is conceivable that this is due to the progress of domestic production. Exports amounted to a little less than US$10,000 in 1988.

(4) Elevators

1) Production

The production trend is shown in Table 3.66.

Production of freight elevators was around 50 - 60 units per year, but shifted to an upward trend

since 1986. Production of passenger elevators was around 30 - 40 units per year, but made a sharp upturn since 1985. The increase in elevator production is the result of the construction boom of 1987 - 1988 and government incentive for assembly of elevators with 4 - 10 persons. This policy also affected the production of freight elevators at the same time. Under the production plan mentioned above at present, there are six enterprises in Bogota and Medellin engaged in the production. Prior to 1983, all elevators were imported in the form of complete products. Imports are continued for those of capacity of 10 or more persons. Production of elevators is expected to climb hereafter at a rate of 10% per year, but it is said that 1989 is on more or less downward trend.

Parts and components necessary for the assembly are made up of domestic products and imported products, and the domestic products account for about 60%, consisting of plywood, shaped material and face plates for the main body structure and the cables, counterweights and shaped steel.

2) Imports and exports

Trends in exports and imports are shown in Table 3.67.

Imports show a downward trend after peaking in 1986. This is on account of the policies of the government. Exports are very small and are intermittent, in a state not worth mentioning.

3.2.5 Electric Household Appliances

(1) Production, exports and imports, and demand outlook

Table 3.68 lists major manufacturers of nine items of electric household appliances. The number of major manufacturers is summarized as follows:

Television	: 14
Radio/Tape Recorder	: 2
Stereo	: 12
Video Tape Recorder	: None
Refrigerator	: 5
Washing Machine	: 5
Air Conditioner	: 10
Cooking Range	: 5

As some companies manufacture more than one item, the total number of electrical equipment manufacturers amounts to 31. Of the total, 15 mainly produce AV equipment including televisions, radios, tape recorders, stereos, etc. and 16 companies primarily produce general electric household appliances, including refrigerators, washing machines, air conditioners, cooking ranges, etc.

Manufacturers of AV products including televisions, radios, tape recorders, stereos, etc., and those of refrigerators, washing machines and cooking ranges are mainly located in Bogota area, while air conditioner manufacturers are distributed nationwide, including Cali, Barranquilla, Cartagena, and Bogota areas.

Table 3.69 shows production of the nine types of electric household appliances during 8 years between 1980 and 1987, which are based on statistical data furnished by the Department of National Statistics (DANE).

Table 3.70 shows imports of these electric household appliances between 1984 and 1989, and Table 3.71 shows exports of these appliances during the same period, which are based on statistical data of the External Trade Agency (INCOMEX) and show in values.

These electric household appliances can be roughly divided into two groups. One is an AV equipment group, which includes televisions, radios, tape recorders, stereos and video tape recorders. The other

is a general electric household appliances group, including refrigerators, washing machines, air conditioners, and cooking ranges.

1) AV equipment

Makers of televisions, radios, tape recorders, and stereos import most of parts from abroad and assemble them domestically.

No video tape recorders are manufactured domestically.

a) Televisions

Production of television sets reached a peak level of more than 120,000 units in 1981 and has remained at 100,000-unit levels thereafter, with some fluctuation from year to year. Major parts manufactured domestically include cabinets, transformers, cables, screw threads, etc. and the nationalization rate is said to be around 30%.

On the other hand, imports of black-and-white televisions reached a peak in 1986 and has been declining since then. Imports of color televisions grew rapidly in 1986 and have been maintaining a level in the annual import value around US$14.7 million. On the other hand, annual exports of more than US$122,000 worth were made after 1988.

b) Radios and tape recorders

Only 719 radio sets were produced in the six-year period from 1982 to 1987. No production data is available in the statistics provided by DANE. All parts for tape recorders are imported and assembled domestically.

Imports of tape recorders grew steadily each year between 1985 and 1988, and the import value amounted to more than US$2,683,000 in 1988.

No export has been recorded.

c) Stereos

Production of both compact stereos and separate-type stereos grew steadily between 1981 and 1985. However, the production reached a peak level of 67,134 units in 1985 and has not surpassed the level since then. Various parts, including cabinets, plastic parts, transformers, loud speakers, impressed circuits, screw threads are manufactured domestically, and the nationalization rate is estimated to be around 50%.

Imports of stereos have been increasing each year, recording US$8,475,000 in 1988.

No export has been recorded, except for US$600 in 1985.

d) Video tape recorders

No video tape recorders are manufactured domestically, and thus no export has been made.

Imports of video tape recorders increased up to 1986, with a record of more than US$3,747,000, and have been declining since then.

In Colombia, imports of domestically manufactured products are restricted as part of government policy to protect domestic industries. However, many AV products have been imported through illegal channels, and half the demand for televisions and stereos within the country is satisfied by smuggling. The prices are said to be at least 30 - 35% cheaper than those manufactured domestically. Therefore, the

import volume listed in Table 3.70 does not accurately reflect import situation of AV products.

Almost no AV products have been exported.

Industry sources say that domestically manufactured AV products are expected to gain market shares because of credit and after-sales services available, and the production is forecast to grow at an annual average rate of 10%.

2) General electric household appliances

General electric household appliances including refrigerators, washing machines, air conditioners and cooking ranges use more metalworking parts as compared to AV products, thus having closer relations with metalworking industries. The nationalization rate of these parts are larger than that of AV products at present.

a) Refrigerators

Production of refrigerators has remained more or less the same between 1980 and 1985, except for minor fluctuations. Then it grew to more than 205,000 units after 1986. The nationalization rate is 70% when imported motor compressors are used, and 95% when domestic motor compressors are used. Parts other than thermostats and capillaries can be procured within the country.

Imports of refrigerators are restricted except for those listed in the trade agreement with the Andes Group countries, accounting for a low level equivalent to 1% of the domestic production.

On the other hand, exports have been fluctuating greatly from year to year and are not likely to show continuous growth.

b) Washing machines

Production of washing machines has been varying each year, but the average is approximately 50,000 units a year. The nationalization rate of semi-automatic washing machines is approximately 80%, and that of full-automatic washing machines is around 35%. Bearings, pumps, valves, solenoids, thermostats, timers, belts, tubes, etc. are imported.

Imports of washing machines have been restricted except for those listed in the trade agreement with the Andes countries, thus representing less than 1% of the domestic production.

Exports of washing macines have been fluctuating greatly from year to year and not likely to record sustainable growth.

c) Air conditioners

Production of air conditioners increased rapidly to 15,862 units in 1984, from the past record of around 9,000 units, and has stabilized at an average 10,000-unit per year level since then. Aluminium sheets, zinc plated sheets, polyurethane, motors, condensers, fans, screw threads, and the like are domestically manufactured, and the nationalization rate is said to be around 60%.

Imports of air conditioners have been growing each year, recording slightly below US$1,577,000 in 1988.
Exports have been made in small quantities since 1988.

d) Cooking ranges

Production of gas cooking ranges reached a peak level in 1982, or 118,480 units, and has dropped

between 92,000 and 49,000 units since then. Production of electrical cooking ranges has varied between 70,000 to 93,000 units per year since 1982. Only thermostats and asbestos-sheathed cables are imported, and the nationalization rate reaches approximately 95%.

Imports of cooking ranges are restricted except for those listed in the trade agreement with the Andes Group countries, remaining at less than 1% of the domestic production.

Exports of cooking ranges have been growing steadily with some fluctuations. In 1988, US$1,490,000 worth of gas cooking ranges and US$460,000 worth of electrical cooking ranges were exported.

A major company in Bogota where the study team visited has been exporting the cooking ranges to neighboring countries, and the company intended to expand the export further. The study team believes that, with further quality improvement and cost reduction, increase in general electric household appliances is highly feasible.

Future outlook for demand for the general electric household appliances, as forecast by industry sources, is as follows:

Refrigerators:	300,000 / year (140,000 by new purchase plus 160,000 for replacement)
Washing machines	: 100,000 / year
Air conditioners	: 15,000 / year
Cooking ranges (gas)	: 100,000 / year*
" (electric)	: A slight decrease compared to the current level*

* Note: These figures are based on the assumption that a project to supply urban gas to a large area in Bogota City. It is said to be very difficult to forecast demand for the two types of cooking ranges at present.

(2) Feasibility of assembly operations and domestic production of parts

As mentioned in (1), electric household appliances excepting video tape recorders have already been assembled domestically.
Domestic production of parts has also been discussed in (1).

Since AV equipment including televisions, radios, tape recorders, stereos, and video tape recorders, do not much involve metalworking products as parts and components, increase in demand for these AV products will not contribute to increase in demand for the metalworking industry.

As for general electric household appliances, including refrigerators, washing machines and cooking ranges, based on results of interview with a major manufacturer in Bogota, metal parts listed later have already been produced domestically. Except for some of casting parts, all sheet metal working, welding, pressing, die casting, and machine processing were done within the company. Furthermore, molds for plastic and seal materials were produced in-house, as well as molding operations.

Major reasons for the manufacturer to select in-house production of these parts, instead of subcontracting, are as follows:

1) The company has its own production facilities.
2) In-house production ensures better quality control, resulting in products with higher quality than those manufactured outside.

3) In-house production also ensures better schedule control, resulting in on-time delivery.
4) Subcontracting is generally more costly than in-house production.

Therefore, the manufacturers will use subcontractors only when their production exceeds own capacities and reliable subcontractors in terms of quality and delivery become available. Given current situations, these conditions are not likely to develop in the near future, thus very small possibility exists to have a subcontracting system.

At the manufacturer visited by the study team, the following metalworking parts were manufactured domestically:

1) Refrigerators

Bodies, doors, racks, condensers, evaporators, accumulators, sheathed cables, handles, etc.

2) Washing machines

Bodies, covers, dehydrated water pans, washing tubs, drums, motors, pulleys, aluminium die cast parts, etc.

3) Cooking ranges

Bodies, doors, top boards, handles, burners, etc.

3.2.6 Electric Machinery, Apparatus and Appliances

(1) Production, export and import, and demand outlook

Table 3.72 lists major manufacturers of 6 types of electric machinery, apparatus and appliances. The number of companies for each item is as follows:

Electric motors	:	6
Transformers	:	4
Power generators	:	0
Panels	:	17
KWH meters	:	4
Switches/Relays, etc.	:	10

As some companies manufacture more than one item, the total number of major manufacturers amount to 31.

Motor manufacturers are all located in Bogota area. Panel, switch/relay manufacturers are also located mainly in Bogota, but panels are also manufactured in Cali, Medellin, Barranquilla, and Bucaramanga, and switches/relays in Medellin and Bucaramanga. Transformer manufacturers are located in Bogota, Medellin, and Pereira areas, and KWH meter manufacturers in Bogota, Cali, Medellin, and Pereira areas. There are 17 panel manufacturers, relatively a large number compared to the manufacturers of other products, but most of them are small scale enterprises. These manufacturers are distributed throughout the country, since panels are custom made according to customers' specifications.

As most of these electric machinery apparatus and appliances are custom made, so that some manufacturers face low capacity utilization rates due to fluctuation in orders booked.

The government is a major user of these electric machinery, apparatus and appliances and requires each manufacture to provide high-quality products. Some companies manufacture the product under technological assistance agreements with foreign companies.

Table 3.73 shows production of electric machinery, apparatus and appliances by items during the 8-year period between 1980 and 1987, based on the statistical data furnished by DANE.

Table 3.74 shows imports of the electric machinery, apparatus and appliances between 1984 and 1989, and Table 3.75 shows exports during the same period, based on the statistical data furnished by INCOMEX and shown in value respectively.

The following are trends in production, export and import of each of 6 items:

1) Motors

Production of motors, as shown in Table 3.73, rapidly decreased each year from 1980 to 1984 as low as 18% of 1980 in 1984. In particular, the decrease ratio in 1984 recorded 50% of the previous year due to, it is said, termination of operation by the largest motor manufacturer in 1984. After 1985, the production gradually grew again although the production level in 1987 still remained 32% of 1980.

In Colombia, single-phase and three-phase motors are produced, but no DC motors are produced. At present, production of single-phase motors is estimated to be approximately 120,000 units per year, and that of three-phase motors is approximately 40,000 units.

Shafts, fans, frames, brackets, stators, coils, bolts and nuts, etc. are domestically produced, and the nationalization rate for these parts has reached 80%.

As seen in the table below, imports of motors have been maintaining levels similar to the domestic production, although the share in the total market has been declining gradually. Exports of motors have been decreasing each year.

Comparison of Domestic Production, Imports and Exports of Motors

(Unit: US$ x 1,000)

	1984	1985	1986	1987
Domestic Production	6,825.0	7,739.0	8,568.4	10,740.3
	(666.6)	(1,064.5)	(1,630.3)	(2,565.0)
Import Value	7,587.5	8,348.0	8,612.9	9,943.5
Export Value	991.1	863.0	361.0	309.8

(Notes): Numbers in ( ) are domestic production indicated in million pesos. The exchange rates (peso/US$) used are official exchange rates for corresponding year.

(Source): Tables 3.73 - 3.75

Imports of DC motors and three-phase motors with more than 40 HP have been increasing in recent years. For example, in 1987, three-phase motors with more than 40 HP accounted for approximately 34% of the total import value for motors, and DC motors 31%.

2) Transformers

Production of transformers did not show noticeable fluctuations between 1980 and 1987. Production of small transformers for electric household appliances decreased in Bogota, due to change in the standard voltage from 150V to 110V.

Iron cores, winding, tanks, oil indicators, and other small parts are produced domestically, and the nationalization rate for parts is said to be approximately 60%.

In Colombia, most of transformers having output of more than 10kVA are custom made. Demand for transformers is determined by government authorities' development programs on the electricity-related industries, and capital investment programs by private companies. Approximately 75% of the domestically produced transformers are purchased by the government authorities through open tenders.

As shown below, imports of transformers have dropped in terms of share against the domestic production. Nevertheless, imports equivalent to 61% of the domestic production were made in 1987. In contrast, exports have been rapidly increasing after 1987.

Comparison of Domestic Production, Imports and Exports of Transformers

(Unit: US$ x 1,000)

	1984	1985	1986	1987
Domestic Production	27,547.9	23,773.9	18,906.8	24,664.2
	(2,690.6)	(3.270.1)	(3,597.4)	(5,890.3)
Import Value	22,787.7	8,903.3	14,047.0	14,921.2
Export Value	267.6	213.0	113.5	2,976.0

(Notes): Numbers in ( ) are domestic production indicated in million pesos. The exchange rates (peso/US$) used are official exchange rates for corresponding year.

(Source): Tables 3.73 - 3.75

While the import data does not show any particular trend, exports of transformers up to 1,000kVA have been rapidly growing since 1987, representing more than 99% of transformer exports in 1987, and 100% in 1988. On the other hand, exports of transformers between 1,000 and 10,000kVA have decreased, and no export have been recorded after 1988. There is

also no export of transformers over 10,000kVA.

3) Power generators

No power generators for power plants have been produced, or no data are available in INCOMEX's statistics on exports and imports.

There is a company which manufactures portable power generator driven by diesel engines, and domestic production of power generators in small quantities is recorded on CIIU CODE 38312022.

4) kWh meters (integrating watt-meters)

Production of kWh meters started about two years ago, and the present production capacity is approximately 150,000 units a year, equivalent to about a half the demand.

As domestic production of kWh meters has started very recently, no data is available in INCOMEX's statistics on exports and imports.

The nationalization rate of the parts is currently at around 30%, but is expected to increase to around 70% in the future. Front glass covers, base plates, terminals, rotors, screw threads, coils, packings, etc. are manufactured domestically.

Demand for single-phase meters is approximately 300,000 units a year, and that for three-phase meters is approximately 50,000 units a year.

5) Panels

Because of custom-made production, panels are manufactured in a variety of types and sizes. Manufacture of cabinets occupies a major portion, while instruments and control equipment are imported for domestic assembly. The nationali-zation rate is said to be approximately 50%.

Comparison of Domestic Production, Imports and Exports of Panels

(Unit: US$ x 1,000)

	1984	1985	1986	1987
Domestic Production	9,006.9	7,400.2	6,666.8	6,265.4
	(879.7)	(1,017.9)	(1,268.5)	(1,496.3)
Import Value	42,077.1	14,032.1	8,504.7	1,777.2
Export Value	1.9	143.8	234.6	121.6

(Notes): Numbers in ( ) are domestic production indicated in million pesos. The exchange rates (peso/US$) used are official exchange rates for corresponding year.

(Source): Tables 3.73 - 3.75

As shown on the above table, the domestic production has decreased on the US dollar basis, but it increased on the local currency basis. A share of imports against the domestic production has been decreasing, but still exceeds the domestic production in recent years, except for 1987. (Note: The 1988 imports totalled 8,283.6 million pesos.)

6) Switches/relays

Most of parts for assembly of switches and relays are imported, and the nationalization rate is estimated to be between 30 and 40%.

Demand for these products depend on government investment on electricity-related industries, as well as capital investment and building construction etc. by the private industry. Most of the manufacturers do not have adequate technological and financial resources to participate in government projects, and this partly explains the import increase. Also, yearly changes in development programs make it difficult to establish firm production plans, resulting in relatively low levels

of capital expenditures on facility expansion.

As mentioned earlier, these electric equipment has been imported in large quantities. Thus, if existing electric machinery, apparatus and appliances manufacturers make effort for quality improvement and cost reduction under appropriate governmental guidance, the industry will be able to boost production significantly for import substitution and exports.

Growth rates expected for the electric machinery, apparatus and appliances industry to meet future demands are as follows:

Up to 1995	:	7.9%
1996 - 2004	:	7.2%
2005 - 2010	:	7.0%

(2) Feasibility of assembly operation and domestic production of parts

As for the electric machinery, apparatus and appliances industry under the study, all items excepting power generators have already been assembled in Colombia, as mentioned in (1).

Domestic production of parts has also been increasing as described in (1).

Based on information obtained from an interview with a major manufacturer of motors, transformers, panels, conductors, and industrial ventilating fans located in Bogota City, the following metalworking materials appear to be manufactured domestically. The company has previously exported 30% of all motors produced to neighboring companies, but the share has dropped to about 10%. The reason for this decrease is the weakening of the local currency, leading to increase in cost of imported materials such as steel sheets and copper wires, as well as bearings, starting capacitors, and other parts, then to deterioration of inter-

national competitiveness.

Considering that motors, transformers, and panels are imported in large quantities, while production capacity for kWh meters satisfies about only one half the demand, domestic production of these equipment can be boosted for import substitution and exporting, provided that the existing manufacturers make conscious efforts toward further quality improvement, productivity increase, and cost reduction under an effective government policy.

Many metalworking parts are used for production of these electric machinery, apparatus and appliances, with close relations with sheet metal working, castings, and other areas. Today, almost all of the metalworking parts are already manufactured domestically, and no parts considering domestic production are identified. Under this circumstance, increase in production of the electric machinery, apparatus and appliances would lead to boost in demand for sheet metal working and casting products, thereby stimulating the related industries.

Nationalization at electric machinery, apparatus and appliances manufacturers which the study team visited is summarized as follows:

1) Motors

In-house produced parts:	Shafts, aluminium fans, steel sheet and aluminium frames, aluminium brackets, stator, and coils
Subcontracted parts:	Casted frames, cast iron brackets, and bolts and nuts

2) Transformers

In-house produced parts: Iron cores, winding, and tanks

3) Panels

In-house produced parts: Cabinets

4) Industrial ventilating fans

In-house produced parts: Shafts, steel sheet outer frames

Subcontracted parts: Cast iron parts, brass parts, bolts and nuts, connectors, aluminium fans for industrial ventilating fans, etc.

3.2.7 Industrial Machinery

This section covers boilers, pumps, diesel engines, gasoline engines, industrial compressors, industrial blowers, and hydraulic machinery, which are considered as capital goods.

(1) Boilers

Table 3.76 shows production, in unit and value, of boilers in Colombia between 1980 and 1987.

Imports and exports of boilers between 1984 and 1989 are summarized in Tables 3.77 and 3.78 respectively.

As shown in the table, the production has been declining slightly after 1980, then made recovery in 1987. On the other hand, export value in this year increased rapidly. This indicates that boiler manufacturers in Colombia have been export-oriented in recent years. This is evidenced by high levels of exports observed

in 1988 and 1989.
There are five major manufacturers in the country. One of them is a plant manufacturer producing high-pressure boilers, as well as turbines and power generators.

Table 3.79 lists the boiler manufacturers.

Each manufacturer has introduced foreign technologies and maintains the high technical level.

Imports of boilers including high-pressure boilers are restricted.

The nationalization rate is approximately 85%. Electric controllers, control valves, steel sheets, and steel pipes are imported.

(2) Pumps

Centrifugal pumps, including submergible pumps, are mainly produced, as well as high-viscosity gear pumps.

Some companies have introduced foreign technologies related to centrifugal pumps, and small and middle-sized types are domestically manufactured in sufficient quantities. Some of the manufacturers have modernized production system and export their products. Large pumps are not manufactured domestically due to relatively small demand.

Import restrictions are imposed on pumps; for instance, pumps with discharge pressure of less than 200GPM X 200psi, and those with discharge rate of less than 10,000GPM X 10psi cannot be imported.

Gear pumps are manufactured by copying imported pumps, but only 10 units are produced per month, which account for 10% of the demand. With modernization and introduction of foreign technologies, production of gear pumps can grow significantly in the future.

Table 3.80 shows production of pumps in Colombia between 1980 and 1987. This indicates that, while production of engine-driven pumps have declined, production of electrical motor-driven pumps have been increasing. This is the result of farm electrification promoted by the government.
There are many pump manufacturers, including nine major companies.

Table 3.81 lists the pump manufacturers.

The industry is expected to grow at an annual average rate of 10% in the future.

Tables 3.82 and 3.83 show imports and exports of pumps between 1984 and 1989.

Imports of centrifugal pumps have been slightly decreasing as a result of nationalization. At the same time, high import values indicate that large-pumps are being imported. In the past few years, exports of centrifugal pumps amounted to 30% that of imports.

Imports of reciprocating pumps have been varying each year, because of dependency on performance of the oil industry.

Rotary pumps are mainly used for hydraulic machinery, and imports have been remaining at a constant level.

The nationalization rate of parts for pumps is approximately 90%.

(3) Diesel engines

In Colombia, production of diesel engines are regulated by Superintendence of Industry and Commerce, and only one company, Lister Petter Diesel S.A. manufactures diesel engines less than 35 HP. The company is capable of producing 810 units monthly to satisfy 50% of the total demand. Also, the company has established a three-year production plan, as follows:

1989 : 1805 units
1990 : 1380 units
1991 : 1440 units

Table 3.84 shows production of diesel engines between 1983 and 1987. Table 3.85 shows imports of diesel engines in value between 1984 and 1989.

The future demand for diesel engines relys very much on the government's electrification program.

Lister Petter Diesel S.A. is doing assembly only and has 30 to 50 subcontractors. The company manufactures welded engine bases only.

Crank shafts, end covers, gears, cases, pistons, piston rings, etc. are imported, and the nationalization rate is not high.

These products can be manufactured domestically so far as technical capability is concerned. However, the domestic production will not be economically feasible unless the parts are mass produced. Nevertheless, Superintendence of Industry and Commerce mandates the nationalization rate for these parts to be raised to 25% by 1990.

(4) Gasoline engines

Renault is the only company which manufactures gasoline engines for automobiles, and import data on gasoline engines for other uses are not available.

(5) Industrial compressors

Table 3.86 shows production of industrial compressors, in unit and value, between 1974 and 1986.

Table 3.87 shows values of industrial compressors imported between 1980 and 1986.

Table 3.88 shows the number of compressors imported between 1980 and 1986.

Domestic production of industrial compressors in Colombia reached 18,900 units in 1986, equivalent to US$3,952,000. These compressors are smaller than 100 HP, mainly below 40 HP and dominated by less than 18 HP class.

Imported compressors accounted for 62% of the 1986 demand, and 91% were more than 40 HP. Similarly, 90% of domestically produced industrial compressors are below 40 HP.

There are 16 compressor manufacturers, of which 14 manufacture those less than 40 HP. Six companies manufacture 40 HP or larger models. Only 8 of the 16 companies are specialized in manufacture of industrial compressors. Large manufacturers have been introducing technologies from foreign companies.

The imported parts are bearings, and some pistons and piston rings only, and the nationalization rate exceeds 90%.

At present, there are too many compressor manufacturers which need to be reduced through competition, followed by mass production capabilities to be established. To achieve this, introduction of NC machinery and machining centers are required.

A feasibility study related to 40 HP or less industrial compressors was conducted in March 1989 by UNIDO.

The study estimated that the annual demand would grow at an annual average rate of 11.6% to 15.1% and recommended a production plant with the minimum practicable production capacity of 2,665 units per year. The production level is equivalent to 7% of the demand expected in 1989, and the nationalization rate is expected to rise from 38% to 50%.

Industrial compressors of more than 40 HP are much fewer in demand as compared to 40 HP or smaller models because of the price being 10 times as much. Nevertheless, it would be recommended to consider domestic production of these pumps at the next step.

(6) Industrial blowers

There are 5 major industrial blower manufacturers. One of the largest manufacturers has been introducing foreign technologies and produce 125 units yearly. Imports of industrial blowers are restricted at present.

According to statistics of DANE and INCOMEX, 1,270 units were produced in 1987, equivalent to US$680,000.

Import value:	1986	US$ (FOB)	948,937
Export value:	1986		5,752
	1987		2,379
	1988		27,194
	1989 (Jan. to Apr.)		3,676

Although no import data are available after 1987, it appears to have decreased.

All parts and materials except bearings and raw steel materials are manufactured domestically. Production of industrial blowers are expected to further grow in the future, with favorable market conditions.

(7) Hydraulic machinery

Hydraulic machinery is used for a wide range of applications, including agricultural machinery, construction equipment, as well as food industry, steel industry, mining industry, and shipbuilding industry, etc.

Hydraulic machinery is generally sold with engineering service.

At present, two foreign hydraulic machinery manufacturers are marketing the products, including engineering service, through local agents.

The market size is 500 - 600 units annually. Domestic production has not been contemplated in this area, and it seems appropriate to start from knockdown production of standard control valves.

For imports of hydraulic pump on a value basis, see Table 3.82.

Currently, some models of vane pumps are KD manufactured.

The above analysis on the industrial machinery industry, based on statistical data and results of interview with major manufacturers, indicates that production of boilers is most modernized, followed by centrifugal pumps, small industrial compressors below 40 HP, and blowers. These products, with appropriate rationalization and upgrading of production facilities, can be boosted to substitute present imports and

to increase exports. As for gear pumps, facility modernization of the existing manufacturers seems appropriate.

3.2.8 Furniture Sector

(1) Steel furniture

Steel furniture manufacturers are located throughout the country. There are only a few large manufacturers, and most of them are classified as the SMEs and the MEs. The steel furniture industry employed 2,000 persons in 1987, according to DANE's data.

Major steel furniture manufacturers are located in Bogota, Medellin, Cali, and Bucaramanga, as shown in Table 3.89.

Types and units of furniture manufactured in Colombia are summarized in Table 3.90.

In 1987, approximately 650,000 units in total (DANE data) were produced, satisfying the domestic demand. As a result, very small quantities of furniture were imported, as shown in Table 3.91.

Imports of steel and metal furniture have been restricted since 1984, excepting sample furniture, imports by diplomats, and imports by Colombians on return from foreign countries.

Exports of furniture appear to be difficult at present due to lack of competitiveness in quality, price and design. In 1988, only US$30,000 worth of furniture was exported, as shown in Table 3.92, and further growth has been recorded since then. Most of the parts and components can be manufactured domestically, and the nationalization rate has reached approximately 95%.

(2) Result of company survey - steel furniture manufacturers

The study team visited 10 SMEs and 21 MEs engaging in manufacturing of doors, window frames and iron fences for houses, and steel furniture, and analysis was conducted on their plants on the basis of questionnaire survey conducted prior to visits.

1) Plant's location, building, and working environment

Most of the plants are located in the commercial and residential areas, where adjacent buildings are very close to prohibit facility expansion. Since they are located close to houses, the plants cause many problems related to noise and ventilation. However, the plants face main roads at the front side to provide excellent access for machinery, raw materials, and products to be brought in and out.

The plants receive electricity only, but they do not require little water supply and waste water treatment, thus not presenting much environmental problems. The plants are made of brick walls and are tin-roofed, not suitable for installing overhead travelling cranes necessary for fabrication of steel frame structures.

There are some MEs which do not have business names and use houses for production. These domestic factories are very dark due to lack of windows, and poor ventilation to result in very poor working environment.

Paint shops have very poor ventilation and partition and are filled with organic solvents. Some shops were not even equipped with ventilators, presenting a number of problems related to safety, health and fire hazards.

These plants manufacture a wide range of products in small quantities to make it difficult to establish a reliable production plan, and the factory layout is mostly inefficient due to lack of working space. Coupled with lack of shopkeeping practice, there are many safety problems.

2) Product development, production technology, and design capability

Design is usually specified by construction companies for building doors, window frames, fences, and the like, and drawings are furnished mostly by customers. In addition, since relatively simple production technology is involved and not many machine tools are required, many manufacturers are competing mainly by pricing.

Steel furniture also has more or less the same design, mostly copied from foreign products, so that the manufacturers inevitably compete in prices. All the manufacturers intend to develop their own products, but designers, engineers, and funds are all in short supply.

It should be noted, however, that there was a company which successfully manufactured and sold highly demanded safes, and other company which sold drawing stands of own design.

3) Machinery owned

The plant do not have advanced machinery but use general-purpose machine tools of 10 years or older, some of which are operated manually. Because of this, prices of products manufactured by the plants are relatively expensive in spite of low labor costs.

a) Major machine tools owned

Lathes, drilling machines, shearing machines, bending machines (mostly manual), small presses, welding machines, compressors for painting equipment, etc.

Some of the MEs use only hand tools.

4) Trade associations and technical assistance organizations

Many companies participate in COPIME because of various privileges available related to financial service and material purchase. However, some of the MEs are informal industries and cannot receive any kind of assistance or support for future development.

Each company intends to receive technical assistance, however, no company can receive it from any organizations including SENA. Also SENA does not introduce appropriate personnel to any companies applied for employees.

(3) Wooden furniture

Although wooden furniture is not the subject of this study, general evaluation and analysis were made in consideration to the fact that metal fittings are used in wooden furniture manufacturing, and in order to obtain general information on the furniture industry as a whole.

Like the steel furniture manufacturers, wooden furniture manufacturers are located throughout the country, and while there are a few large companies, most of them are classified as SMEs and MEs which manufacture less competitive products by labor-intensive operations at unmodernized factories with poor working

environment.

There were approximately 200 wooden furniture manufacturers in 1987, employing around 7,000 people. (DANE's data)

As shown in Table 3.93, approximately 550,000 units of wooden furniture were produced in 1987 (DANE's data), enough to satisfy the domestic demand for wooden furniture. The production has been increasing at a stable rate, with some fluctuation according to product types. Imports of wooden furniture are restricted, and the 1988 import totalled US$200,000 as shown in Table 3.94.

On the other hand, exports of wooden furniture amounted to US$3 million between 1987 and 1988, as shown in Table 3.95.

Most of parts and components for wooden furniture can be manufactured domestically, thus the nationalization rate reaches approximately 95%.

Table 3.19 GROWTH, CONTRIBUTION PERCENTAGE OF THE AGRICULTURE SECTOR FOR TOTAL GNP 1970 – 1985

Annual	Growth Rate (1)		Agri. GNP	Sector Contribution
	Total GNP	GNP	Total GNP	
1970–1975	5.8	4.3	23.1 %	22.6 %
1975–1980	5.5	4.6	22.4	23.9
1980–1985	2.0	1.1	21.5	7.9
1970–1985	4.3	3.5	22.3	15.6

Note: (1) Data of growth is annual average.

Source: DNP-UDA calculation is based DANE data

Table 3. 20 PRODUCTION OF AGRICULTURAL MACHINERY AND EQUIPMENT

Class	Products	Corporation															
		Metal-agro	Apolo	Tall Caitan	Inter-agro	Bufalo	Inducal	Disagro	Intall	Promes	Agroteo	Pinto Kunzer	El Campo	Agroeq. Rios	Bonem	Total
Implements	Cortamalezas (Grass Cutter)		○		○				○		○					4
	Retroexcavadoras (Retroexcavator)					○										1
	Zanjadoras (Trencher)	○			○		○					○		○		5
	Surcadora (Ridger)											○		○		2
	Polvo (Duster)											○				1
	Palasniveladuras (Leveling Shovel)	○			○	○	○			○		○		○		7
Preparation of Cultivated Land	Rastra-Arado (Rake-Plow)	○			○		○	○		○				○		6
	Plow Arados (Plow)		○		○									○		3
	Rastra (Rake)	○	○		○		○	○				○		○		7
	Rastrillo (Rake)	○	○		○			○				○		○		6
	Caballoneadoras (Ridging Equipment)	○			○									○		3
	Aporoadores (Earthing up Equipment)	○						○						○		3
	Rotocultivator (Rotary Tiller)				○				○							2
	Arado de Cincel (Chisel Plow)	○			○		○	○	○	○				○		7
	Arado Subsolador (Subsoiler Plow)	○			○			○		○				○		5

Class	Products	Corporation															
		Metal-agro	Apola	Tall Caitan	Inter-agro	Bufalo	Inducal	Disagro	Intall	Promes	Agroteo	Pinto Kunker	El Campo	Agroeq. Rios	Bonem	Total
Sowing	Sembradoras (Seeder)		○					○								2
	Voleadoras (Broadcaster (Scatter))	○	○								○			○		4
Cultivation	Cultivadoras (Cultivator)	○			○			○	○					○		5
Transport	Remolques (Trailer)	○	○		○	○		○		○		○	○	○		9
	Cargadores (Loader)					○								○		2
Parts	Discos (Disks)				○										○	2
Manufacturing Machine	Molinos (Flour Mill)				○								○			2
	Mezcladoras (Mixer)				○								○			2
	Desgranadoras (Thresher)				○								○			2
Others	Picapastos (Pasture Fork)			○					○				○			3
	Ensiladoras (Silo for Glass)												○			1
	Trapiches (Press for Sugar Cane)		○	○												2

Table 3.21 PRICE OF TRUCTOR

Unit: 1,000 Pesos in Current price

Horse Power	1981	1982	1983	1984	1985	1986	1987	1988
70 HP	720	950	1,120	1,690	2,959	3,350	4,180	4,450
80 HP	1,050	1,360	1,785	2,550	3,854	4,228	5,780	5,950
100 HP		1,710	2,230	3,100	4,631	5,600	6,915	7,220
120 HP	1,800	2,140	2,480	3,960	6,591	6,800	8,325	8,840
160 HP	2,720	3,220	3,700	5,150	9,845	10,462	11,925	12,400

Source: FEDEARROZ

Table 3.22 IMPORTS OF AGRICULTURAL HARVESTERS
(1984 - 1988 and the first semester 1989)

Unit: US$ FOB

Nabandine Code	1984	1985	1986	1987	1988	1989 Jan-Jul
84.25.01.21	919,534	1,187,289	6,202,551	4,571,382	11,249,754	5,362,093

Source: INCOMEX

Table 3.23 PRODUCTION, IMPORTS AND EXPORTS OF THRESHERS

PRODUCTION OF THRESHERS
(1980 - 1987)

Unit: x 1,000 pesos

CIIU Code	Year	Number of Units	Value
38223062	1980	82	17,079
	1981	92	15,066
	1982	144	21,242
	1983	50	3,000
	1984	38	3,388
	1985	38	4,186
	1986	24	3,480
	1987	71	29,015

Source: DANE

IMPORTS OF THRESHERS
(1984 - 1989)

Unit: US$ FOB

Nabandina Code	Year	Value
84.25.02.01	1984	-
	1985	-
	1986	32,735
	1987	10,531
	1988	34,180
	1989 *	442

Source: INCOMEX
* January - July

EXPORTS OF THRESHERS
(1984 - 1989)

Unit: US$ FOB

Nabandina Code	Year	Kilos	Value
84.25.02.01	1984	135,134	529,679
	1985	236,245	791,527
	1986	405,085	1,374,908
	1987	422,520	1,398,002
	1988	345,756	1,459,987
	1989 *	170,886	724,920
	1986	24	3,480
	1987	71	29,015

Source: INCOMEX
* January - July

Table 3.24 PRODUCTION OF COFFEE PULPERS
(1980 - 1987)

Unit: US$ 1,000

CIIU Code	year	Number of Units	Value
38229010	1980	9,977	58,854
	1981	18,120	112,693
	1982	8,166	76,610
	1983	9,108	66,190
	1984	10,567	116,964
	1985	10,480	170,441
	1986	13,558	281,445
	1987	12,380	376,425

Source: DANE

Table 3.25 IMPORTS AND EXPORTS OF SOWING MACHINES

IMPORTS OF SOWING MACHINES
(1984 - 1989)

Unit: US$ FOB

Nabandina Code	Year	Value
84.24.02.11	1984	86,053
	1985	146,615
	1986	1,111,695
	1987	1,525,626
	1988	1,458,785
	1989 (1)	555,234

Note: (1) January - July
Source: INCOMEX

EXPORTS OF SOWING MACHINES
(1984 - 1989)

Unit: US$ FOB

Nabandina Code	Year	Kilos	Value
84.24.02.11	1984	2,639	3,800
	1985	12,744	35,000
	1986	34,802	120,450
	1987	17,955	54,095
	1988	2,425	8,920
	1989	-	-

Source: INCOMEX

Table 3.26 PARTICIPATION OF THE SECTOR OF CONSTRUCTION IN THE GROSS DOMESTIC PRODUCTS

Unit: Million Pesos in 1975 price

Year	GDP		GDP	Share(%)	
	Construction	Dwelling	Total	Construction	Dwelling
1974	15,023	4,281	395,910	3.79	1.08
1975	13,535	3,790	405,108	3.34	0.94
1976	14,735	4,057	424,263	3.47	0.96
1977	15,877	4,288	441,906	3.59	0.97
1978	15,471	4,642	479,335	3.23	0.97
1979	15,383	4,076	505,119	3.05	0.81
1980	17,632	4,584	525,765	3.35	0.87
1981	18,884	4,721	537,736	3.51	0.88
1982	19,648	5,157	542,836	3.62	0.95
1983	22,193	6,835	555,380	4.00	1.23
1984	23,606	6,745	569,855	4.14	1.18
1985 (1)	24,414	7,001	583,715	4.18	1.20
1986 (1)	22,998	6,872	613,550	3.75	1.12

Note : (1) Provisional Figures of DANE
Soruce: DANE

Table 3.27 AUTHORIZED AND ACTUAL IMPORTS OF CONSTRUCTION EQUIPMENTS

Unit: Nos.

	1981	1982	1983	1984	1985	1986	1987	1988 (1)
Backhoe Loader	-	-	-	-	-	143	252	280 (131)
Excavator	-	-	-	-	-	336	409	457 (237)
Bulldozer	410	507	516	249	441	311	312	291 (182)
Wheel Loader	321	379	210	125	108	136	220	114 (106)
Motor Grader	266	99	168	80	52	91	134	107 (93)
Road Roller	-	-	301	96	49	90	88	94 (64)
Total	997	985	1195	550	650	1107	1415	1343 (813)

Note : (1) As of November, 1988
Figures in Parentheses indicate the Number of Actual Imports
Source: INCOMEX, SOBORDOS

Table 3.28 PROMISING PRODUCTS

CONSTRUCTION EQUIPMENT
Frame, Shoe, Front Idler, Roller, Shaft, Gear, Fuel Tank, Hydraulic Tank, Control Linkage, Control Lever and Shaft, Control Rod End, Radiator, Hose, Exhaust System, Air Cleaner, Cabin Ass'y Operator Seat, Electric Component Hoe Boom, Arm, Bucket, Counter Weight

Table 3.29 IMPORTS AND EXPORTS OF CONSTRUCTION EQUIPMENT

Unit: US$FOB

Import	1984	1985	1986	1987	1988	1989 (1)
Bulldozer (2)	11,843,332	27,869,465	18,260,505	28,775,721	28,865,474	24,784,491
Excavator	19,658,168	35,450,750	40,665,070	55,664,291	60,577,771	36,487,839
Road Roller (3)	512,637	609,039	344,466	862,661	1,232,791	463,613
Total	32,014,137	63,929,254	59,270,041	85,302,673	90,676,036	61,735,943

Export	1984	1985	1986	1987	1988	1989 (1)
Bulldozer	-	-	-	-	-	-
Excavator	15,000	751,026	-	-	-	100,000
Road Roller	-	-	-	-	-	-
Total	15,000	751,026	-	-	-	100,000

Notes : (1) As of July, 1989
(2) Including Motor Grader
(3) Including Wheel Roader
Source: INCOMEX

Table 3.30 DOMESTIC PRODUCTION OF LATHES FOR METALS

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1980	462	4,142
1981	403	3,211
1982	68	560
1983	49	348
1984	25	333
1985	25	334
1986	19	239
1987	32	325

Source: DANE

Table 3.31 MANUFACTURERS OF LATHES FOR METALS

Company	Location
DUROMET	BOGOTA
FABLAMP	CALI
METALURGICAS DE RISARALDA	PEREIRA

Source: INCOMEX

Table 3.32 IMPORT OF LATHES FOR METALS

Unit: US$

Year	Type of Lathes				
	Turret	Universal	Parallel	Vertical	Automatic	Other
1984	143,978	1,655,774	581,500	530,407	149,850
1985	84,229	997,121	-	576,800	298,994
1986	746,381	4,905,331	108,554	2,559,714	1,010,041
1987	598,587	3,643,031	103,076	1,607,281	1,262,491
1988	726,171	5,536,169	119,539	3,452,693	3,225,930
1989 (1)	514,072	2,469,383	13,350	691,274	653,446

Noto: (1) January - July
Source: INCOMEX

Table 3.33 EXPORT OF LATHES FOR METALS

Unit: US$

Year	Type of Lathes				
	Turret	Universal	Parallel	Vertical	Automatic	Other
1984	-	-	-	-	1,976
1985	-	142,651	-	-	1,300
1986	-	25,290	-	-	4,679
1987	40,230	138,435	4,000	-	-
1988	28,300	31,550	-	1,000	-
1989 (1)	-	-	-	6,000	-

Note: (1) January - July
Source: INCOMEX

Table 3.34 DOMESTIC PRODUCTION OF DRILLING MACHINES AND SIMILAR MACHINES FOR METALS

Unit: US$ 1,000

Year	Number of Units	Number of Units in Stock	Value of Sales in Factory
1980	105	-	455
1981	305	-	305
1982	41	-	103
1983	79	-	148
1984	2,327	627	505
1985	1,291	367	192
1986	2,310	816	219
1987	2,101	745	294

Source: DANE

Table 3.35 IMPORT OF DRILLING MACHINES

Unit: US$

Year	Type of Drilling Machines		
	Radial > 65mm Hole Diameter	Other Radial Drilling Machines	Other Drilling Machines
1984	21,825	69,340	1,128,223
1985	76,480	46,738	61,629
1986	41,639	292,105	173,096
1987	54,808	431,017	585,591
1988	41,524	423,488	1,118,460
1989 (1)	123,825	292,502	291,214

Note: (1) January - July
Source: INCOMEX

Table 3.36 MANUFACTURERS OF DRILLING MACHINES AND SIMILAR MACHINES FOR METALS

Company	Location
DUROMET	BOGOTA
FABLAMP	CALI
FRANCO HERMANOS	BOGOTA
MAQUINARIA INDUSTRIAL DON BOSCO	BOGOTA
METALURGICAS DE RISARALDA	PEREIRA
PANTECNICA LTDA	BOGOTA
TECNIMETAL	MEDELLIN
INDUSTRIAS REY y CASTILLO	BOGOTA

Source: INCOMEX

Table 3.37 DOMESTIC PRODUCTION OF SHEARING

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1980	49	173
1981	82	199
1982	44	178
1983	39	73
1984	805	159
1985	939	146
1986	489	97
1987	146	225

Source: DANE

Table 3.38 MANUFACTURERS OF SHEARING

Company	Location
EMPRESA ANDINA DE HERRAMIENTAS	CALI
FABLAMP	CALI
FRANCO HERMANOS	BOGOTA
TECNIMETAL	CALI

Source: INCOMEX

Table 3.39 IMPORT OF SHEARING MACHINES

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value	207,980	89,038	477,163	432,997	386,755	286,980

Note: (1) January - July
Source: INCOMEX

Table 3.40 IMPORT OF MILLING MACHINES

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value	1,274,574	1,226,982	5,769,275	4,266,882	7,660,000	1,906,962

Note: (1) January - July
Source: INCOMEX

Table 3.41 MANUFACTURERS OF MILLING MACHINES

Company	Location
DUROMET	BOGOTA
FABLAMP	CALI

Source: INCOMEX

Table 3.42 IMPORT OF GRINDING MACHINES, AND TOOL AND CUTTER GRINDERS

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value	278,814	593,433	2,197,863	1,639,385	4,859,385	1,635,768

Note: (1) January - July
Source: INCOMEX

Table 3.43 DOMESTIC PRODUCTION OF BENDING MACHINES

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1980	80	244
1981	67	339
1982	76	259
1983	41	146
1984	13	165
1985	12	65
1986	14	62
1987	38	59

Source: DANE

Table 3.44 MANUFACTURERS OF BENDING MACHINES

Company	Location
FABLAMP	Cali

Source: INCOMEX

Table 3.45 IMPORT OF BENDING MACHINES

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value	969,559	1,584,941	1,325,155	2,396,557	1,856,116	526,000

Note: (1) January - July
Source: INCOMEX

Table 3.46 EXPORT OF BENDING MACHINES

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value	95,039	196,568	209,380	187,390	74,349	46,980

Note: (1) January - July
Source: INCOMEX

Table 3.47 DOMESTIC PRODUCTION OF HYDRAULIC PRESS

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1980	4	83
1981	61	222
1982	106	359
1983	12	83
1984	1	29
1985	7	142
1986	13	248
1987	57	287

Source: DANE

Table 3.48 MANUFACTURERS OF HYDRAULIC PRESS

Company	Location
COHA LTDA	BOGOTA
NIKE COLOMBIANA S.A.	BOGOTA
IND. RET	CALI

Source: INCOMEX and JICA's diagnosis of the enterprises

Table 3.49 APPARENT AUTOMOBILE HOLDINGS BY TYPE OF VEHICLES

Unit: Nos.

Type	Apparent Holdings 1987/Dec. 31	National Production 1988/Dec. 31	Authorized Imports 1988/Dec. 31	Apparent Holdings
Automobile	655,201	44,388	7,333	706,922
Jeep	233,555	4,050	1,919	239,524
Light Truck	180,686	7,166	398	188,250
Micro Bus	4,794	-	-	4,794
Light Bus	15,813	-	101 (1)	15,914
Bus	53,354	1,757	-	55,111
Truck	110,384	1,554	66 (2)	112,004
Lorry Truck	27,004	1,440	-	28,444
Tractor	7,661	681	29	8,371
Chassis with Cabin	50	-	50	100
Special Vehicle	627	-	2,671 (3)	3,298
Chassis with Engine	2	-	-	2
Others	12,671	-	-	12,671
Total	1,301,802	61,036	12,567	1,375,405

Note : (1) Including Buses
(2) Including Lorry Truck
(3) Ambulance, Funeral Car

Source: - SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
- INTRA
- INCOMEX

Table 3.50 AUTOMOBILE HOLDINGS IN COLOMBIA BY CLASS OF SERVICE, ACCORDING TO THE DEPARTMENT, FEBRUARY 1989 (1)

Unit: Nos.

	Private	(%)	Public	(%)	Official	(%)	Total	Distribution (%)
ANTIOQUIA	162,549	81.81	31,808	16.01	4,333	2.18	198,690	15.21
ATLANTICO	58,800	77.13	16,177	21.22	1,261	1.65	76,238	5.84
BOLIVAR	27,423	68.88	11,494	28.87	895	2.25	39,812	3.05
BOYACA	24,477	72.11	8,739	25.74	730	2.15	33,946	2.60
CALDAS	24,237	78.02	6,090	19.60	737	2.37	31,064	2.38
CUNDINAMARCA (2)	443,571	85.84	67,620	13.09	5,578	1.08	516,769	39.57
HUILA	16,331	72.80	5,243	23.37	859	3.83	22,433	1.72
NARIÑO	13,859	67.85	6,016	29.45	551	2.70	20,426	1.56
META	13,916	77.97	3,467	19.43	464	2.60	17,847	1.37
NR. DE SANTANDER	5,948	49.28	5,968	49.45	153	1.27	12,069	0.92
QUINDIO	14,451	76.58	3,972	21.05	448	2.37	18,871	1.44
RISARALDA	20,318	80.35	4,756	18.81	212	0.84	25,286	1.94
SANTANDER	52,230	80.78	10,835	16.76	1,592	2.46	64,657	4.95
TOLIMA	25,177	71.88	9,134	26.08	713	2.04	35,024	2.68
VALLE	118,903	77.52	29,972	19.54	4,501	2.93	153,376	11.74
OCAÑA	2,409	61.58	1,474	37.68	29	0.74	3,912	0.30
POPAYAN	12,005	76.06	3,073	19.47	706	4.47	15,784	1.21
SINCELEJO	5,653	66.06	2,761	32.26	144	1.68	8,558	0.66
VALLEDUPAR	8,168	73.07	2,707	24.22	304	2.72	11,179	0.86
TERRITORIOS NALES.	28	62.22	0	0.00	17	37.78	45	0.00
Total	1,050,453	80.43	231,306	17.71	24,227	1.86	1,305,986	100.00

Notes : (1) Realized Census in February 1989 based on the Register of Each Region of INTRA
(2) CUNDINAMARCA includes BOGOTA D.E.
(3) Not including Vehicles of The Ministry of Labor, The Ministry of Defense, and The Ministry of Foreign Affairs.

Source: INTRA

Table 3.51 PRICES OF VEHICLES

December 31, 1988

COLMOTORES		C.C.A.		SOFASA	
Vehicle	Pesos	Vehicle	Pesos	Vehicle	Pesos
Chevrolet Sprint	3,737,000	Mazda 323 HB/HS 1.3	4,492,000	R-4 Base	2,725,800
Chevette 4 P.	4,441,000	Mazda 323 HE pint.pl.	3,833,000	R-4 Master	2,819,200
Chevette Taxi	3,242,000	Mazda 323 NB/NX 1.5	5,445,000	R-9 Taxi	3,931,800
Monza Classic Automa.	8,110,000	Mazda 323 NT Taxi	3,977,000	R-9 TSE p.plana	4,648,900
Monza Classic Mecanic.	7,672,000	Mazda 323 NS pint.pl.	4,679,000	R-9 GTX p.plana	5,397,300
Monza SLE sin A.A.	6,157,000	Mazda 323 SW	6,006,000	R-21 sin aire p.pla.	7,978,800
Monza SLE con A.A.	6,574,000	Mazda 626 L	7,004,000	R-21 con aire p.pla	8,377,900
Luv KB-21 s.pl.part	4,843,000	Mazda 626 LX	8,390,000	R-21 Break sin aire	8,699,600
Luv.KB-21 con plat.	5,946,000	Mazda 626 GLX	8,700,000	R-21 Break con aire	9,134,600
Luv KB-41 s.pl.part.	5,221,000	Mazda B-2000 sin pl.	5,178,000		
Luv KB-41 con plat.	6,324,000	Mazda B-2000 con pl.	5,591,000		
Chevrolet Trooper	6,391,329	Mazda B-2000 Serv. Public.	4,706,000		
C-30 135"	6,531,836				
B-60 218" Gas	9,391,592				
C-70 149" Gas	10,015,670				
C-70 189" Gas	10,143,320				
Super Brigad 169" Cummins	36,028,390				
Brigadier 169" DDA	32,377,528				
Brigadier 229" DDA	30,877,516				
CHR-580	16,831,909				

Source: MINISTERIO DE DESARROLLO ECONOMICO

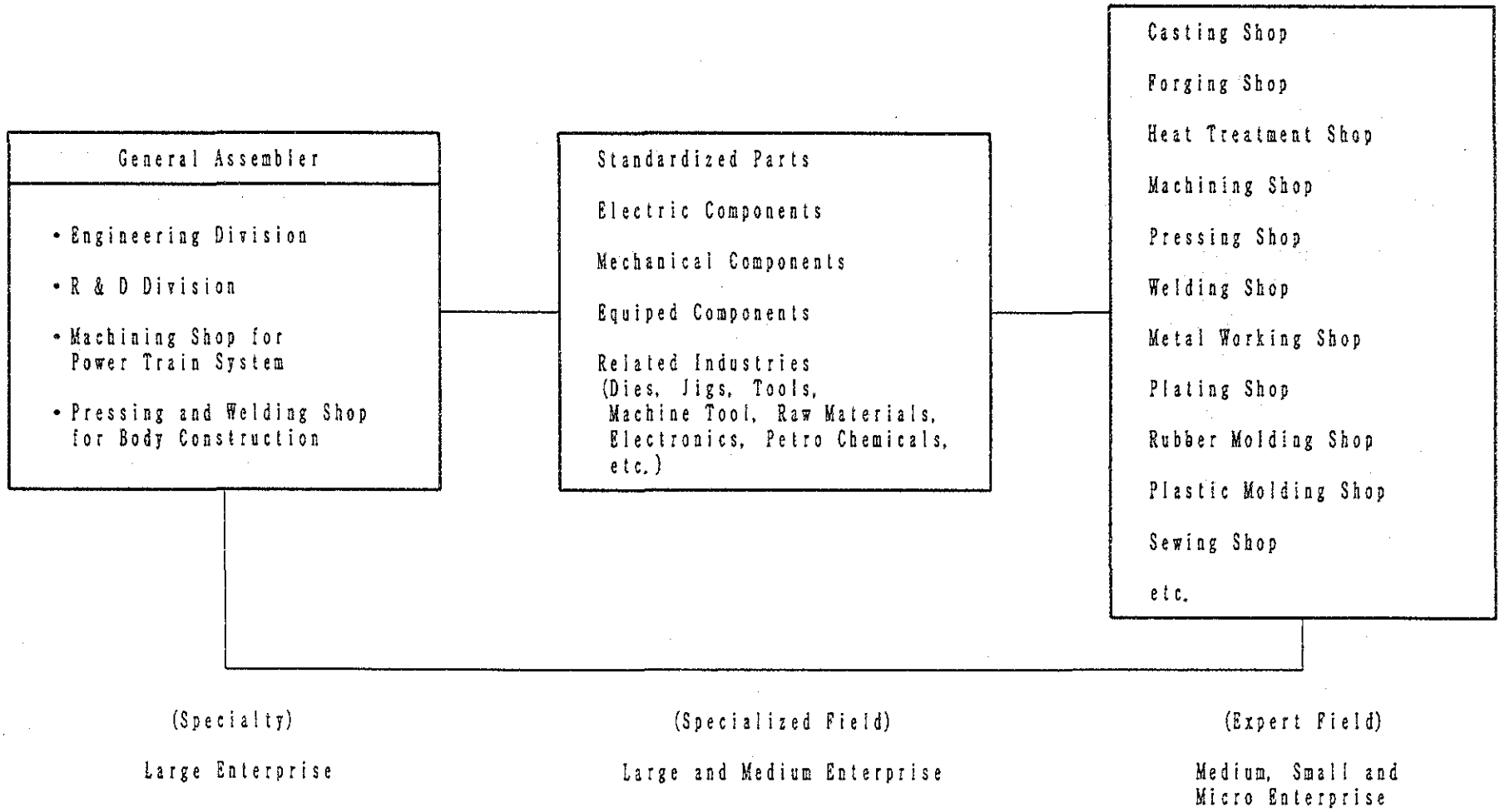
Table 3.52 SUPPLY OF AUTOMOTIVE VEHICLES 1981 - 1988

Unit: Nos.

	1981	1982	1983	1984	1985	1986	1987	1988
AUTOMOBILES	33,984	34,932	22,750	35,426	35,138	36,652	42,487	45,704
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
National Production	24,732	26,515	21,374	33,948	33,179	35,480	40,598	44,387
% Participation	(72.8)	(75.9)	(94.0)	(95.8)	(94.4)	(96.8)	(95.6)	(97.1)
Imports	9,252	8,417	1,376	1,478	1,959	1,172	1,889	1,317
	(27.2)	(24.1)	(6.0)	(4.2)	(5.6)	(3.2)	(4.4)	(2.9)
COMMERCIALS	15,251	11,081	7,850	11,523	6,048	8,583	11,225	12,959
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
National Production	10,826	9,052	6,775	11,209	5,883	8,176	11,089	12,598
% Participation	(71.0)	(81.7)	(86.3)	(97.3)	(97.3)	(95.3)	(98.8)	(97.2)
Imports	4,425	2,029	1,075	314	165	407	136	361
	(29.0)	(18.3)	(13.7)	(2.7)	(2.7)	(4.7)	(1.2)	(2.8)
JEEP	19,130	22,845	17,402	2,664	2,273	3,342	2,781	8,360
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
National Production	0	0	0	0	0	0	0	4,050
% Participation	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(48.4)
Imports	19,130	22,845	17,402	2,664	2,273	3,342	2,781	4,310
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(51.6)
TOTAL	68,365	68,858	48,002	49,613	43,459	48,577	56,493	67,023
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
National Production	35,558	35,567	28,149	45,157	39,062	43,656	51,687	61,035
% Participation	(52.0)	(51.7)	(58.6)	(91.0)	(89.9)	(89.9)	(91.5)	(91.1)
Imports	32,807	33,291	19,853	4,456	4,397	4,921	4,806	5,988
	(48.0)	(48.3)	(41.4)	(9.0)	(10.1)	(10.1)	(8.5)	(8.9)

Source: SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, SOBORDOS

Table 3.53 TYPICAL LINKAGE FORM OF AUTOMOBILE INDUSTRY



Source : JICA Team

Table 3.54 OUTLINE OF ASSEMBLERS, 1988

Assembler (Participator)	Location	Installed Capacity	Production Model	Employees	Capital Structure	
COLMOTORES (GENERAL MOTOR)	BOGOTA	32,000	SPRINT, CHEVETTE, MONZA, LUV, TROOPER C-30, C-70, BRIGADIER CHR, B-60	1,408	Local GENERAL MOTOR	18% 82%
C.C.A. (MAZDA)	BOGOTA	20,000	MAZDA 323 MAZDA 626 B-2000 (PAJERO)	1,186	Local MAZDA SUMITOMO	70% 15% 15%
SOFASA (RENAULT)	MEDELLIN	32,000	RENAULT 4 RENAULT 9 RENAULT 21 (TOYOTA)	1,100	Local RENAULT (TOYOTA	0.4% 99.6% 25%)
Total		84,000		3,694		

Source: SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO, ACOLFA, & ETC.

Table 3.55 NATIONAL PRODUCTION OF VEHICLES DISCRIMINATE BY MANUFACTURER AND MODEL

Unit: Nos.

		1985	1986	1987	1988	Total
COLMOTORES	Model	16	19	18	20	29
	Production	8,461	15,711	21,000	26,958	72,130
C.C.A	Model	8	10	8	11	14
	Production	13,822	10,165	15,851	18,018	57,856
SOFASA	Model	9	10	8	8	15
	Production	16,779	17,780	14,836	16,059	65,454
Total	Model	33	39	34	39	58
	Production	39,062	43,656	51,687	61,035	195,440

Source: SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Table 3.56 PRODUCTION PROGRAM FOR NEXT THREE YEARS AUTHORIZED BY SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Unit: Nos.

		1989	1990	1991
COLMOTORES	Model	24	21	21
	Production	30,286	29,760	31,177
C.C.A.	Model	12	12	12
	Production	29,988	30,900	33,915
SOFASA	Model	22	22	22
	Production	27,896	30,685	33,753
Total		58	55	55
		88,170	91,345	98,845

Source: SUPERINTENDENCEA DE INDUSTRIA Y COMERCIO

Table 3.57 PARTICIPATION OF THE AUTOMOTIVE SECTOR
IN THE MANUFACTURING INDUSTRIES

Unit: Million Pesos

Description		Nos. of Enterprise	Nos. of Employee	Wages and Salary (1)	Social Welfare	Gross Production (2)	Intermediate Consumption (2)	Value Added	Energy Consumption	Net Investment (3)
1980	A	6,850	516,275	62,058.0	40,882.3	777,876.4	440,732.3	337,144.3	5,050,697.2	23,196.0
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	172	16,166	2,309.4	1,389.0	34,192.4	25,322.7	8,869.7	59,457.2	4,054.3
		(2.5)	(3.1)	(3.7)	(3.4)	(4.4)	(5.7)	(2.6)	(1.2)	(17.5)
1981	A	6,792	501,035	77,842.8	53,618.1	944,017.4	534,924.5	409,146.9	5,409,711.9	36,877.0
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	164	14,595	2,731.5	1,965.8	37,989.6	26,451.2	11,538.4	55,687.1	1,319.0
		(2.4)	(2.9)	(3.5)	(3.7)	(4.0)	(4.9)	(2.8)	(1.0)	(3.6)
1982	A	7,067	489,023	96,562.0	74,990.6	1,123,075.0	671,007.6	452,067.4	5,555,994.3	62,779.9
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	176	13,294	3,124.7	2,406.9	44,146.3	29,649.0	14,497.3	47,344.8	2,530.2
		(2.5)	(2.7)	(3.2)	(3.2)	(3.9)	(4.4)	(3.2)	(0.9)	(4.0)
1983	A	6,249	472,044	117,167.4	92,341.0	1,374,303.4	825,666.2	548,637.2	5,868,629.0	73,185.7
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	143	11,575	3,442.3	2,909.3	39,431.1	29,238.6	10,192.5	43,969.8	828.6
		(2.3)	(2.5)	(2.9)	(3.2)	(2.9)	(3.5)	(1.9)	(0.7)	(1.1)
1984	A	6,258	464,457	144,272.5	115,385.7	1,800,034.6	1,077,194.6	722,840.0	6,675,199.0	48,387.5
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	143	12,157	4,583.1	3,855.8	72,613.8	55,564.4	17,049.4	50,762.0	982.1
		(2.3)	(2.6)	(3.2)	(3.3)	(4.0)	(5.2)	(2.4)	(0.8)	(2.0)
1985	A	6,406	446,771	170,627.8	136,557.2	2,393,060.9	1,438,073.7	954,987.2	6,169,738.0	72,827.3
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	140	10,951	4,981.8	3,822.5	83,120.6	60,495.8	22,624.8	42,540.5	3,270.3
		(2.2)	(2.5)	(2.9)	(2.8)	(3.5)	(4.2)	(2.4)	(0.7)	(4.5)
1986	A	6,684	463,356	207,480.2	172,526.3	3,228,347.5	1,921,121.8	1,307,225.7	7,204,819.2	111,521.7
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	150	12,228	6,461.6	5,436.5	136,893.0	106,151.1	30,741.9	54,969.3	1,263.6
		(2.2)	(2.6)	(3.1)	(3.2)	(4.2)	(5.5)	(2.4)	(0.8)	(1.1)
1987	A	6,972	477,170	266,233.0	233,862.9	4,302,380.6	2,691,881.2	1,610,499.4	7,580,037.2	163,622.0
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	B	155	13,521	9,219.5	6,959.8	230,164.3	176,127.4	54,036.9	57,140.0	2,265.5
		(2.2)	(2.8)	(3.5)	(3.0)	(5.3)	(6.5)	(3.4)	(0.8)	(1.4)

Notes : A: Manufacturing Industries
B: Automotive Sector (CIIU : 3843)
(Figures in Parentheses indicate % of Share)
(1) Period of Payment containing Nov. 15 or before and behind the Month
(2) Including the Value of Indirect Tax
(3) Including the Value of Revaluation of Existing Assets

Source: DANE

Table 3.58 NATIONALIZED PARTS AND COMPONENTS OF VEHICLE IN AUTOPARTS MANUFACTURERS

A) Nationalized Products

- Engine Group
  Radiator, Filter for Oil, Air and Fuel, Water Pump, Fuel Pump, Piston and Ring, Gasket, Exhaust System, Clutch, Flywheel

- Electric Equipment
  Spark Plug, High-Tension Cable, Distributor, Starting Motor, Generator, Battery, Electric Components, Wire, Wireharness, Lamp, Fuel Gauge

- Chassis Group
  Rubber Tyre, Disc Wheel, Hydraulic Brake System, Shock Absorber, Leaf/Coil Spring, Ball Joint, Front/Rear Axle, Shafts, Gears, Chasis Frame, Fuel Tank, Hook and Yoke, Pipe, Hose

- Body Group
  Radiator Grill, Safty Glass, Door Trimming, Seat, Seat Belt, Air Conditioning System, Interior Trimming

- Others
  Small Molding Parts (Rubber, Plastic)
  Small Die Casting Parts (Al)
  Small Stampling Parts (Forging, Pressing)
  Many Other Parts of Simple Technology
  Standardized Articles (Bolt, Nut, Washer, Pin, etc.)

B) Promising Products

- Engine Group
  Engine Block, Cylinder Head, Connecting-Rod, Crank Shaft, Cam Shaft, Rocker Arm, Rocker Shaft, Rocker Bracket, Bearing Block, Oil Pan, Covers, Intake/Exhaust Manifold, Intake/Exhaust Valve, Cooling Fan, Piston Pin, Gears, Shafts, Pulley, Thermostat, Belt

- Electric Equipment
  Battery Cable, Ignition Coil, Horn, Meters, Gauge, Wiper, Wire Connectors

- Chassis Group
  Transmission Case, Covers, Gears, Shift Fork, Shift Shaft, Control Linkage, Propeller Shaft, Joint Spider, Universal Joint, Arms, Levers, Tie Rod End, Tie Rod, Knuckle Arm, Knuckel, King Pin, Spring Shackle, Spring Pin, Drag Link, Steering Wheel, Steering Column, Casings, Oil Seal, Control Cable, Brake/Fuel Tube

- Body Group
  Door Hinges, Door Lock, Weatherstrip, Window Regulator, Seat Adjustment, Window Washer

Source : Interview by JICA Team

Table 3.59 AUTHORIZED IMPORTS OF COMPLETE VEHICLES

Unit: Nos.

Descripcion	1981	1982	1983	1984	1985	1986	1987	1988
Tractor	139	68	69	16	95	19	298	29
Jeep	45,771	47,740	19,741	3,258	5,398	7,057	3,521	1,919
Automobile	12,394	20,690	2,005	2,206	3,111	4,665	2,625	7,333
Bus and Microbus	1,115	1,514	819	32	80	265	74	101
Ambulance, Funeral car	252	58	36	29	7	354	281	15
Pick-up with carring platform and pannels	1,903	1,717	262	194	142	160	66	127
Truck with Body and Lorry Truck	894	373	899	194	220	120	196	66
Pick-up W/O Platform and Light Truck W/O Cabin	4,020	2,379	491	19	29	13	6	271
Chassis with Cabin	369	184	115	31	94	23	50	50
Special Vehicle	450	498	427	244	278	709	346	2,656
Chassis with Engine	27	15	1	-	207	73	2	-
Total	67,334	75,241	24,865	6,223	9,661	13,458	7,465	12,567
- AUTOMOBILES	12,394	20,690	2,005	2,206	3,111	4,665	2,625	7,333
- COMMERCIALS	9,169	6,811	3,119	759	1,152	1,736	1,319	3,315
- JEEPS	45,771	47,740	19,741	3,258	5,398	7,057	3,521	1,919

Source: INCOMEX

Table 3.60 UTILIZATION OF THE AUTHORIZED IMPORT LICENSES OF COMPLETE VEHICLES

Unit: Nos.

	1981	1982	1983	1984	1985	1986	1987	1988
Automobiles								
Authorized Imports	12,394	20,690	2,005	2,206	3,111	4,665	2,625	7,333
Realized Imports	9,252	8,417	1,376	1,478	1,959	1,172	1,889	1,317
Ratio	74.6	40.7	68.6	67.0	63.0	25.1	72.0	18.0
Commercials								
Authorized Imports	9,169	6,811	3,119	759	1,152	1,736	1,319	3,315
Realized Imports	4,425	2,029	1,075	314	165	407	136	361
Ratio	48.3	29.8	34.5	41.4	14.3	23.4	10.3	10.9
Jeeps								
Authorized Imports	45,771	47,740	19,741	3,258	5,398	7,057	3,521	1,919
Realized Imports	19,130	22,845	17,402	2,664	2,273	3,342	2,781	4,310
Ratio	41.8	47.9	88.2	81.8	42.1	47.4	79.0	224.6
Total								
Authorized Imports	67,334	75,241	24,865	6,223	9,661	13,458	7,465	12,567
Realized Imports	32,807	33,291	19,853	4,456	4,397	4,921	4,806	5,988
Ratio	48.7	44.2	79.8	71.6	45.5	36.6	64.4	47.6

Source: INCOMEX, REVISTA SOBORDOS

Table 3.61 DATA OF ASSEMBLER OF MOTORCYCLE, 1988

Assembler (Participator)	Location	Installed Capacity Nos./Year	Production Model	Employee Nos.	Capital Structure
INCOLMOTO (YAMAHA)	Medellin	15,000	LB80, V80 DT100, DT125	120	YAMAHA: 20% Local : 80%
GEMELA (SUZUKI)	Pereira	24,000	F250, FR80 AX100, TS125	150	SUZUKI: 85% Local : 15%
AUTECO (KAWASAKI)	Medellin	12,000	AN80, G7 (GTO100) KE100, KE125	50	Local : 100%
FANALCA (HONDA)	Cali	12,000	C70, NH80 XL125, XL185	70	Local : 100%
Total		63,000		390	

Source: JICA TEAM

Table 3.62 PRODUCTION OF MOTORCYCLES BY ASSEMBLERS AND MODELS

Unit: Nos.

Assembler		1977-1981	1982	1983	1984	1985	1986	1987	1988	Total
INCOLMOTOS	Model	8	5	8	6	4	4	4	4	15
(YAMAHA)	Production	52,743	4,189	6,643	5,680	4,150	3,400	4,720	6,000	87,525
GEMELA	Model	9	7	8	6	4	4	4	4	13
(SUZUKI)	Production	38,550	11,189	18,048	13,284	7,440	9,345	8,184	9,346	115,386
AUTECO	Model	8	6	8	7	6	4	5	5	11
(KAWASAKI)	Production	57,280	4,000	3,500	4,600	1,800	950	1,750	1,850	75,730
FANALCA	Model	1	4	7	6	4	4	4	4	9
(HONDA)	Production	76	3,582	8,280	7,900	4,677	3,880	3,170	5,020	36,585
Total	Model	26	22	31	25	18	16	17	17	48
	Production	148,649	22,960	36,471	31,464	18,067	17,575	17,824	22,216	315,226

Source: SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Table 3.63 REALIZED IMPORTS OF MOTORCYCLES

Unit: Nos.

Assembler	1983	1984	1985	1986	1987	1988	1989 (1)
INCOLMOTO	6,457	5,086	2,669	3,026	4,921	6,320	5,460
(YAMAHA)	(397)	(206)	(69)	(126)	(221)	(220)	(160)
GEMELA	15,770	9,962	7,200	9,720	8,280	10,440	9,000
(SUZUKI)	(50)	(2)	(0)	(0)	(0)	(0)	(0)
AUTECO	1,950	2,450	1,450	1,000	1,350	1,750	1,400
(KAWASAKI)	(0)	(0)	(0)	(0)	(0)	(2)	(0)
FANALCA	9,515	7,700	3,900	3,503	3,500	4,901	4,100
(HONDA)	(715)	(0)	(0)	(3)	(0)	(1)	(0)
Total	33,692	25,198	15,219	17,249	18,051	23,411	19,960
	(1,162)	(208)	(69)	(129)	(221)	(223)	(160)

Note : (1) As of September 1989.
Figures in Parentheses indicate the number of Complete-built-up Motorcycle, and the figures are included in the above amount.
Source: JICA TEAM

Table 3.64 PRODUCTION OF BICYCLE

Unit: Nos.

	1980	1981	1982	1983	1984	1985	1986	1987
Bicycle (For Touring)	45,408	38,112	38,246	46,120	44,874	43,744	47,040	40,471
Bicycle (For Racing)	10,026	8,391	20	2,916	2,608	1,500	2,254	928
Total	55,434	46,503	38,266	49,036	47,482	45,244	49,294	41,399

Source: DANE

Table 3.65 IMPORTS AND EXPORTS OF BICYCLE

Unit: US$ FOB

Import	1984	1985	1986	1987	1988	1989 (1)
Less Than Dia. 50cm	59,448	22,852	57,860	69,628	11,566	27,049
More Than Dia. 50cm	48,347	93,730	179,743	110,199	44,794	27,268
Total	107,795	116,582	237,603	179,827	56,360	54,317

Export	1984	1985	1986	1987	1988	1989 (1)
Less Than Dia. 50cm	-	-	-	-	-	-
More Than Dia. 50cm	-	-	-	-	9,084	-
Total	-	-	-	-	9,084	-

Note : (1) As of July, 1989
Source: INCOMEX

Table 3.66 PRODUCTION OF ELEVATOR

Unit: 1,000 Pesos

		1980	1981	1982	1983	1984	1985	1986	1987
For Freight	Nos.	61	57	68	60	240	55	72	127
	Value	24,688	28,611	40,721	20,809	27,559	29,763	51,423	42,593
For Person	Nos.	34	37	30	32	38	70	149	174
	Value	24,978	43,407	42,505	70,691	101,797	204,200	454,352	829,308
Total	NOS.	95	94	98	92	278	125	221	301
	Value	49,666	72,018	83,226	91,500	129,356	233,963	505,775	871,901

Source: DANE

Table 3.67 IMPORTS AND EXPORTS OF ELEVATOR

Unit: US$ FOB

Import	1984	1985	1986	1987	1988	1989 (1)
W/O Cage	1,570,898	4,625,627	9,665,181	7,897,806	7,457,213	6,083,107
Others	1,887,853	2,413,038	1,689,891	712,892	407,172	277,246
Total	3,458,751	7,038,665	11,355,072	8,610,698	7,864,385	6,360,353

Export	1984	1985	1986	1987	1988	1989 (1)
W/O Cage	35,432	-	-	-	-	-
Others	-	-	131,318	-	-	-
Total	35,432	-	131,318	-	-	-

Note : (1) As of July, 1989
Source: INCOMEX

Table 3.68 MAJOR MANUFACTURERS OF ELECTRIC HOUSEHOLD APPLIANCES

Products	Name of Company	Location
Television	INDUSTRIAS JOBI LTDA.	BOGOTA
	FABRICA DE RADIOS MC.SILBER LTDA.	BOGOTA
	COMPANIA ELECTRONICA COLOMBIANA S.A.	BOGOTA
	INELSO LTDA.	BOGOTA
	INCELT.	BOGOTA
	COLEL LTDA.	BOGOTA
	INDUSTRIAS ELECTRA.	BOGOTA
	CNOSTELACCION LTDA.	BOGOTA
	INDUBLEC LTDA.	BOGOTA
	COLDETRON S.A.	CALI
	CANDLE ELECTRONICA DE COLOMBIA.	CALI
	INDUSTRIAS PHILIPS DE COLOMBIA S.A.	CALI
	TELECENTER DE COLOMBIA LTDA.	MEDELLIN
	MICROCAUCA S.A.	POPAYAN
Radio/Tape Recorder	FABLICA DE RADIOS MC.SILVER LTDA.	BOGOTA
	COLEL LTDA.	BOGOTA
Stereo	COMPANIA ELECTRONICA CLOLMBIANA S.A.	BOGOTA
	CONSTELACION LTDA.	BOGOTA
	INCELT.	BOGOTA
	FABRICA DE RADIOS MC.SILVER S.A.	BOGOTA
	INELSO LTDA.	BOGOTA
	INDUSTRIAS JOBI LTDA.	BOGOTA
	COLEL LTDA.	BOGOTA
	INDUSTRIAS TECNIC SONICL LTDA.	BOGOTA
	INDUBLEC LTDA.	BOGOTA
	INDUSTRIAS PHILIPS DE COLOMBIA S.A.	BOGOTA
	CANDLE ELECTRONICA DE COLOMBIA.	CALI
	COLDETRON S.A.	CALI
Video Tape Recorder	(NO MANUFACTURER)	
Refrigerator	ICASA.	BOGOTA
	INDUACERO.	BOGOTA
	CORELSA.	BOGOTA
	MACEB S.A.	MEDELLIN
	PHILIPS.	MANIZALES
Washing Machine	CORELSA.	BOGOTA
	HOOVER INDUSTRIAL Y COMERCIAL S.A.	BOGOTA
	ICASA.	BOGOTA
	INDUACERO.	BOGOTA
	PHILIPS.	MANIZALES
Air Conditioner	INCELT.	BOGOTA
	TECNAIRE.	BOGOTA
	REFRIGERACION DE COLOMBIA.	CALI
	SECAR LTDA.	CALI
	AIRE CALI.	CALI
	INDUSTRIAS COLOMBIA.	BARRANQUILLA
	INDUSTRIA PARAMO.	BARRANQUILLA
	MOSERES S.A.	BARRANQUILLA
	FANZIRE.	CARTAGENA
	ERNCIS LTDA.	CARTAGENA
Cooking Range (Electric and Gas)	CORELSA.	BOGOTA
	ICASA.	BOGOTA
	INDUACERO.	BOGOTA
	MACEB S.A.	MEDELLIN
	ESTUFAS.	MEDELLIN

Source: The Industrial Sector Survey by Mr. Villamizar

Table 3.69 PRODUCTION QUANTITY OF ELECTRIC HOUSEHOLD APPLIANCES

Products	CIIU Code	Item	1980	1981	1982	1983	1984	1985	1986	1987
Television	38321021	(1)	102,589	120,438	118,236	87,494	113,578	97,714	81,807	111,578
		(2)	1,295.1	2,500.9	2,593.4	2,715.3	4,523.3	4,646.7	5,721.1	9,302.1
Radio	38321013	(1)	3,282	1,561	305	115	18	22	110	149
		(2)	13.5	6.2	1.9	1.5	0.3	0.4	4.4	9.3
Tape Recorder	38321064	(1)	0	0	0	0	0	0	0	0
		(2)	0	0	0	0	0	0	0	0
Stereo (Compact Type)	38321072	(1)	15,143	15,056	21,165	25,928	38,079	53,536	23,229	45,743
		(2)	276.7	409.3	564.1	977.7	1,763.2	2,247.3	2,581.3	4,132.7
Stereo (Separate Type)	38324021	(1)	13,537	4,698	4,649	6,684	8,361	13,598	9,328	11,021
		(2)	203.5	100.2	117.6	238.4	379.3	681.2	656.6	1,007.2
Video Tape Recorder		(1)	0	0	0	0	0	0	0	0
		(2)	0	0	0	0	0	0	0	0
Refrigerator	38274058	(1)	187,615	178,545	187,991	154,730	194,966	172,174	205,698	240,442
		(2)	2,610.1	2,864.6	3,522.3	3,414.5	5,359.1	5,761.5	7,955.2	12,047.9
Washing Machine	38333011	(1)	47,463	58,474	53,960	49,463	58,955	51,995	34,064	48,564
		(2)	1,081.1	1,566.5	1,699.1	1,725.3	2,705.1	3,254.5	2,774.3	5,148.0
Air Conditioner	38272021	(1)	9,071	8,797	8,291	8,951	15,862	10,006	9,127	11,545
		(2)	289.7	313.0	391.6	512.8	714.1	925.7	1,514.8	2,425.5
Cooking Range (Gas)	38295012	(1)	46,024	67,322	118,480	81,010	61,059	83,800	49,496	91,940
		(2)	395.0	581.4	1,206.0	921.8	1,191.3	1,488.8	1,458.8	2,321.7
Cooking Range (Electric)	38295047	(1)	92,850	101,249	76,238	70,482	71,509	86,233	77,734	93,886
		(2)	696.6	883.0	799.5	891.4	1,147.7	1,509.8	1,792.1	2,409.3

Note : Item (1) = Number of Product
(2) = Amount of Product in million pesos

Source: DANE. PRODUCCION Y EXISTENCIAS DE ARTICULOS POR AGRUPACION NIVEL NACIONAL. 1980 - 1987.

Table 3.70 IMPORTED QUANTITY OF ELECTRIC HOUSEHOLD APPLIANCES

Unit: US$ 1,000

Products	Type	Nabandina Code	1984	1985	1986	1987	1988	1989 (1)
Television	Black and White	85.15.04.01	431.4	476.3	2,354.9	1,543.2	213.0	233.1
	Color	85.15.04.11	3,807.5	4,181.2	15,212.2	14,693.2	14,734.2	8,074.2
Radio/Tape Recorder	Automobile	85.15.03.01	105.9	104.4	180.9	401.2	1,332.7	241.1
	Others	85.15.03.99	1,174.7	779.6	913.8	1,022.4	1,350.8	623.1
Stereo		85.14.04.00	2,036.8	1,820.1	6,136.2	7,922.2	8,475.2	5,305.4
Video Tape Recorder		92.11.12.00	1,386.4	2,175.4	3,746.8	3,028.3	2,960.0	1,275.2
Refrigerator		84.15.01.01	138.8	183.3	503.5	718.0	546.9	391.5
Washing Machine		84.40.01.01	90.4	106.2	204.8	226.7	299.3	165.7
Air Conditioner	Up to 30,000 BTU	84.12.01.01	163.7	240.6	733.6	681.4	906.4	300.4
	Others	84.12.01.99	620.3	471.6	310.4	529.5	670.3	354.5
Cooking Range	Gas	73.36.01.00	28.5	51.5	14.7	45.2	42.6	31.3
	Electric	85.12.05.01	43.1	6.7	57.8	72.7	11.1	0.0
Official Exchange Rate (Peso/US $)			97.67	137.55	190.27	238.82	293.23	-

Note : (1) = January - July
Source: INCOMEX. IMPORTACIONES. 1984 - 1989

Table 3.71 EXPORTED QUANTITY OF ELECTRIC HOUSEHOLD APPLIANCES

Unit: US$ 1,000

Products	Type	Nabandina Code	1984	1985	1986	1987	1988	1989 (1)
Television	Black and White	85.15.04.01	0.0	0.0	0.0	0.0	0.0	0.0
"	Color	85.15.04.11	0.0	0.0	0.0	0.0	122.1	165.0
Radio/Tape Recorder	Automobile	85.15.03.01	0.0	0.0	0.0	0.0	0.0	0.0
"	Others	85.15.03.99	0.0	0.0	0.0	0.0	0.0	0.0
Stereo		85.14.04.00	0.0	0.6	0.0	0.0	0.0	0.0
Video Tape Recorder		92.11.12.00	0.0	0.0	0.0	0.0	0.0	0.0
Refrigerator		84.15.01.01	67.7	1,063.4	3.8	2,321.6	281.9	164.9
Washing Machine		84.40.01.01	84.1	122.4	1,067.1	139.3	0.6	83.6
Air Conditioner	Up to 30,000 BTU	84.12.01.01	0.0	0.0	0.0	0.0	0.0	0.0
"	Others	84.12.01.99	0.0	0.0	0.0	0.0	4.7	2.0
Cooking Range	Gas	73.36.01.00	177.2	212.8	800.8	535.5	1,489.8	383.9
"	Electric	85.12.05.01	154.0	268.4	775.4	193.2	459.4	362.8
Official Exchange Rate (Peso/US $)			97.67	137.55	190.27	238.82	293.23	-

Note : (1) = January - July
Source: INCOMEX. EXPORTACIONES. 1984 - 1989.

Table 3.72 MAJOR MANUFACTURERS OF ELECTRIC MACHINERY APPARATUS AND APPLIANCES

Products	Name of Company	Location
Electric Motor	ICASA. (SINGLE-PHASE)	BOGOTA
	BARNES DE COLOMBIA. (SINGLE-PHASE)	BOGOTA
	CORELSA. (SINGLE-PHASE)	BOGOTA
	INCELT. (SINGLE-PHASE)	BOGOTA
	VOLHO S.A. (SINGLE-PHASE)	BOGOTA
	SIEMENS S.A. (SINGLE-AND THREE-PHASES)	BOGOTA
Transformer	SIEMENS S.A.	BOGOTA
	PROTECVOLT.	BOGOTA
	ANDINA S.A. DE TRANSFORMADORES.	MEDELLIN
	TPL S.A.	PEREIRA
Power Generator	(NO MANUFACTURER)	
Panel	ASEA DE COLOMBIA.	BOGOTA
	BROWN BOVERI DE COLOMBIA.	BOGOTA
	AEG COLOMBIANA.	BOGOTA
	COLOMBIANO DE TABLEROS ELECTRICOS.	BOGOTA
	METALURGICA DE LOS ANDES.	BOGOTA
	MERLIN CIERIN DE COLOMBIA.	BOGOTA
	ROLONIT.	BOGOTA
	FORMACERO.	BOGOTA
	SIEMENS S.A.	BOGOTA
	CIEM.	BOGOTA
	INDUSTORIAS TECNILKA.	BOGOTA
	FADAT LTDA.	BOGOTA
	CODEL.	CALI
	INDUSTRIAS REBRA.	CALI
	INDUSTRIAS METAL ELECTRICAS.	MEDELLIN
	ELECTRO TABLEROS.	BARRANQUILLA
	CELCO.	BUCARAMANGA
KWH Meter	FAMELECL.	BOGOTA
	ELECTRO MEDICIONES ANDINA.	CALI
	RIMEL.	MEDELLIN
	TPL S.A.	PEREIRA
Switches/Relay, etc.	AEG COLOMBIANA.	BOGOTA
	A.U.E. COLOMBIANA.	BOGOTA
	BROWN BOVERI DE COLOMBIA	BOGOTA
	ELINSA.	BOGOTA
	FORMACERO.	BOGOTA
	ROLONIT.	BOGOTA
	SIEMENS S.A.	BOGOTA
	ANDINA S.A. DE TRANSFORMADORES.	MEDELLIN
	INDUSTORIAS VERA.	MEDELLIN
	CELCO.	BUCARAMANGA

Source: JICA Team survey

Table 3.73 PRODUCTION QUANTITY OF ELECTRIC MACHINERY APPARATUS AND APPLIANCES

Products	CIIU Code	Item	1980	1981	1982	1983	1984	1985	1986	1987
Electric Motor	38312014	(1)	273,215	210,239	120,987	98,438	49,916	50,250	54,907	86,552
		(2)	428.8	989.1	586.5	541.6	666.6	1,064.5	1,630.3	2,565.0
Transformer	38313011	(1)	115,010	295,813	209,353	121,900	155,138	95,154	86,825	121,710
		(2)	942.5	185.3	163.3	133.1	179.3	192.3	207.0	315.3
Transformer (For High Voltage)	38313045	(1)	961	20,079	19,962	18,147	15,501	14,217	15,809	19,906
		(2)	119.2	1,340.6	1,668.9	2,003.4	2,511.3	3,077.8	3,390.4	5,575.0
KWH Meter	38314016	(1)	0	0	0	0	0	0	0	3,600
		(2)	0	0	0	0	0	0	0	27.4
Panel										
(Control Panel)	38314017	(1)	330	331	301	241	347	373	310	341
		(2)	38.0	38.3	33.5	33.6	78.6	87.6	159.6	279.8
(Distribution Panel)	38314025	(1)	16,432	117,650	128,942	63,104	91,232	120,641	64,831	20,684
		(2)	275.6	333.2	473.2	744.6	796.8	911.4	1,107.3	1,115.9
(Commuting Panel)	38314033	(1)	16,655	77	81	65	112	389	19	531
		(2)	5.1	2.1	2.4	3.1	4.3	18.9	1.6	100.6
Switches/Relay, etc.										
(High tension fuses)	38314041	(1)	13,757	6,799	3,448	1,492	0	0	31	36
		(2)	35.3	23.1	11.2	5.8	0	0	1.1	1.5
(Electric fuses)	38314050	(1)	525,790	157,891	187,983	134,130	126,728	260,653	396,666	440,240
		(2)	20.2	9.9	12.2	18.3	16.5	23.5	54.7	71.1
(Safety Switches)	38314068	(1)	15,472	20,785	11,416	29,636	11,621	35,020	38,369	78,507
		(2)	41.4	74.7	65.3	137.0	172.8	308.4	300.2	1,125.5
(Knife Switches)	38314076	(1)	126,499	51,621	54,868	70,023	69,017	63,949	76,710	84,289
		(2)	14.0	7.5	9.5	13.8	18.0	44.7	33.9	46.2
(Electric Industrial Controls	38314084	(1)	33,614	1,486	513	570	2,502	2,215	2,078	2,277
		(2)	22.8	33.6	30.5	5.0	119.2	120.3	145.5	201.4
Power Generator		(1)	0	0	0	0	0	0	0	0
		(2)	0	0	0	0	0	0	0	0
Generator	38312022	(1)	65	225	2,005	633	845	540	820	894
		(2)	0.9	1.5	79.4	7.3	13.7	8.1	46.0	220.0

Note : Item (1) = Number of Product.
(2) = Amount of Product in million peso.
Source: DONE. PRODUCCION Y EXISTENCIAS DE ARTICULOS POR AGRUPACION NIVEL NACIONAL. 1980 - 1987.

Table 3.74 IMPORTED QUANTITY OF ELECTRIC MACHINERY APPARATUS AND APPLIANCES

Unit: US$ 1,000

Products	Type	Nabandina Code	1984	1985	1986	1987	1988	1989 (1)
Electric Motor	Direct Current up to 10 HP	85.01.04.01	363.3	642.5	1,242.9	1,687.7	1,826.6	1,276.0
'	Other Direct Current	85.01.04.99	372.2	474.7	791.9	1,351.3	469.1	1,582.7
'	Single-phase up to 1/2 HP	85.01.05.01	2,869.4	3,276.7	1,833.6	1,850.8	1,454.3	2,094.4
'	Other Single-phase	85.01.05.99	10.1	15.2	44.4	86.3	47.1	231.4
'	Three-phase up to 1 HP	85.01.06.01	78.8	167.6	152.5	323.6	292.2	190.8
'	Three-phase 1 - 10 HP	85.01.06.05	480.3	607.7	561.1	587.9	648.3	336.1
'	Three-phase 10 - 25 HP	85.01.06.11	213.7	190.4	381.1	530.1	337.5	158.2
'	Three-phase 25 - 40 HP	85.01.06.15	513.6	285.2	227.1	192.6	131.6	50.5
'	Other Three-phase	85.01.06.99	2,686.1	2,688.0	3,378.3	3,333.2	3,642.9	2,784.4
Transformer	Up to 10 KVA	85.01.11.01	2,694.4	2,058.6	2,817.5	2,178.8	1,189.4	1,333.0
	10 - 1,000 KVA	85.01.11.02	9,532.8	973.9	1,312.5	1,848.6	7,560.4	3,130.5
	1,000 - 10,000 KVA	85.01.11.03	3,081.8	168.5	100.5	3,170.8	984.4	222.2
	More than 10,000 KVA	85.01.11.04	7,478.7	5,702.3	9,816.5	7,723.0	5,751.5	4,451.3
KWH Meter		-- -- -- --	-	-	-	-	-	-
Power Generator		-- -- -- --	-	-	-	-	-	-
Panel	Capacities up to 20,000 V	85.19.61.01	15,160.4	6,490.1	5,778.6	1,427.7	2,247.6	1,379.1
'	Others	85.19.61.99	26,916.7	7,542.0	2,726.1	349.5	6,036.0	148.6
Switches/Relay, etc.								
(Switch)	For Automobile	85.19.01.01	1,653.1	2,314.0	2,348.7	1,920.0	1,947.9	1,828.7
	Up to 260 V and 30 A	85.19.01.09	1,742.9	2,407.4	1,976.4	2,231.9	1,643.2	1,315.8
	For Tension up to 1,000 V	85.19.01.19	2,224.3	3,543.3	2,564.1	2,687.9	2,563.5	2,004.3
	Other Switches	85.19.01.99	15,185.8	7,546.5	9,482.0	7,918.0	4,356.0	3,740.4
(Section Switch)	Up to 260 V and 30 A	85.19.06.01	9.5	165.5	9.4	17.2	3.6	1.7
	Up to 1,000 V	85.19.06.09	71.3	82.8	93.9	115.8	138.7	33.3
	Others Section Switches	85.19.06.99	1,844.8	1,307.4	1,851.7	1,636.4	1,055.0	2,764.6
(Relay)	Up to 260 V and 30 A	85.19.16.01	1,929.0	2,616.2	3,574.3	3,737.0	3,528.3	2,726.8
	For Electronic Uses	85.19.16.11	255.1	142.9	230.7	306.1	246.0	179.6
	Other Relays	85.19.16.99	697.5	641.4	835.5	1,879.9	1,271.0	643.8
(Circuit Breaker)	Up to 260 V and 30 A	85.19.21.09	331.0	384.5	247.7	439.9	293.5	293.3
	For Tension up to 1,000 V	85.19.21.19	1,702.5	1,531.8	2,014.3	2,480.1	3,366.3	2,480.0
	Other Circuit Breakers	85.19.21.99	291.3	325.0	749.5	546.5	719.0	386.8
Official Exchange Rate (Peso/US $)			97.67	137.55	190.27	238.82	293.23	-

Note : (1) = January - July
Source: INCOMEX. IMPORTACIONES. 1984 - 1989.

Table 3.75 EXPORTED QUANTITY OF ELECTRIC MACHINERY APPARATUS AND APPLIANCES

Unit: US$ 1,000

Products	Type	Nabandina Code	1984	1985	1986	1987	1988	1989 *
Electric Motor	Direct Current up to 10 HP	85.01.04.01	0.0	0.0	0.0	0.0	0.0	0.0
"	Other Direct Current	85.01.04.99	0.0	0.0	0.0	0.1	0.0	0.0
"	Single-phase up to 1/2 HP	85.01.05.01	20.6	10.2	177.4	62.9	9.1	0.0
"	Other Single-phase	85.01.05.99	0.0	0.0	0.0	0.0	0.0	0.0
"	Three-phase up to 1 HP	85.01.06.01	116.6	133.6	16.9	45.5	1.8	0.7
"	Three-phase 1 - 10 HP	85.01.06.05	635.3	568.5	41.1	201.3	8.7	0.7
"	Three-phase 10 - 25 HP	85.01.06.11	211.0	150.7	117.3	0.0	128.6	0.0
"	Three-phase 25 - 40 HP	85.01.06.15	7.6	0.0	8.3	0.0	8.2	0.0
"	Other Three-phase	85.01.06.99	0.0	0.0	0.0	0.0	0.0	0.0
Transformer	Up to 10 KVA	85.01.11.01	0.0	0.0	0.0	889.5	589.7	1,250.5
	10 - 1,000 KVA	85.01.11.02	181.6	123.8	75.6	2,060.5	3,743.5	1,978.6
	1,000 - 10,000 KVA	85.01.11.03	86.0	89.2	37.9	26.0	0.0	0.0
	More than 10,000 KVA	85.01.11.04	0.0	0.0	0.0	0.0	0.0	0.0
KWH Meter		-- -- -- --	-	-	-	-	-	-
Power Generator		-- -- -- --	-	-	-	-	-	-
Panel	Capacities up to 20,000 V	85.19.61.01	1.9	143.8	234.6	121.6	88.0	106.2
"	Others	85.19.61.99	0.0	0.0	0.0	0.0	0.0	533.0
Switches/Relay, etc.								
(Switch)	For Automobile	85.19.01.01	2.1	1.3	1.4	8.6	1.0	0.0
	Up to 260 V and 30 A	85.19.01.09	55.9	49.8	100.6	439.8	913.2	579.4
	For Tension up to 1,000 V	85.19.01.19	0.0	2.1	0.7	1.3	1.8	0.0
	Other Switches	85.19.01.99	25.4	0.0	3.5	0.5	6.1	4.5
(Section Switch)	Up to 260 V and 30 A	85.19.06.01	0.0	16.4	13.3	6.5	1.6	5.1
	Up to 1,000 V	85.19.06.09	0.0	0.0	8.6	3.2	3.9	52.8
	Others Section Switches	85.19.06.99	19.0	36.4	26.6	0.0	4.2	0.0
(Relay)	Up to 260 V and 30 A	85.19.16.01	0.0	0.0	0.0	0.2	4.7	0.0
	For Electronic Uses	85.19.16.11	0.0	0.0	0.0	0.0	3.7	0.0
	Other Relays	85.19.16.99	0.0	0.6	1.4	0.0	0.0	0.0
(Circuit Breaker)	Up to 260 V and 30 A	85.19.21.09	20.1	439.0	552.4	902.7	2,864.0	1,388.3
"	For Tension up to 1,000 V	85.19.21.19	0.0	2.0	96.6	85.0	369.7	207.4
	Other Circuit Breakers	85.19.21.99	33.8	275.1	471.3	370.1	369.3	545.2
Official Exchange Rate (Peso/US $)			97.67	137.55	190.27	238.82	293.23	-

Note : * = January - July
Source: INCOMEX. IMPORTACIONES. 1984 - 1989.

Table 3.76 DOMESTIC PRODUCTION OF BOILERS

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1980	1,784	13,062
1981	242	11,725
1982	194	8,592
1983	149	6,167
1984	159	7,962
1985	182	6,046
1986	135	3,999
1987	139	8,302

Source: DANE

Table 3.77 IMPORT OF BOILERS

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value Water Tubes	2,792	847,000	1,800	650,324	5,007	198
Other Types	623,508	158,624	365,918	232	156,340	54,227

Note: (1) January - July
Source: INCOMEX

Table 3.78 EXPORT OF BOILERS

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value Water Tubes	333,400	265,500	1,346,400	6,405,822	5,296,916	14,000,923
Other Types	307,324	447,491	65,720	356,203	1,003,226	952,213

Note: (1) January - July
Source: INCOMEX

Table 3.79 MAKER LIST OF BOILERS

Company	Location
COLMAQUINAS	Bogota
COMESA-INDUSTRIA METALMECANICA S.A.	Bogota
DISTRAL S.A.	Barranquilla
CALDERAL CONTINENTAL	Bogota
APIN TECHNIK	Bogota

Source: INCOMEX

Table 3.80 DOMESTIC PRODUCTION OF PUMPS

Unit: Quantity

Year	Number of Units	
	With Explosion Engine	With Electric Motor
1980	12,137	8,429
1981	8,814	8,556
1982	6,015	7,640
1983	6,244	7,943
1984	5,341	9,277
1985	4,335	18,154
1986	6,040	10,307
1987	7,114	22,384

Source: DANE

Table 3.81 MAKER LIST OF PUMPS

Company	Location
AGROINDUSTRIAL PAREZ	BOGOTA
BARNES DE COLOMBIA	BOGOTA
BOMBAS PLEUGER Y HALBERG	BOGOTA
COLPOZOS	CALI
HIDROMAC LTDA	BARRANQUILLA
INDUSTRIAS HIDROMECANICA-IHM	BOGOTA
INDUSTRIA SURTIDOR	MEDELLIN
PENAGOS HORMANOS	BUCARAMANGA
WORTHINGTON COLOMBIANA S.A.	BOGOTA

Source: INCOMEX

Table 3.82 IMPORT OF PUMPS

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value Reciprocating	1,032,070	1,603,338	1,220,663	667,651	1,002,640	630,307
Rotative Centrifugal	443,317	1,011,822	798,624	1,217,518	1,270,626	670,758
One Stage Other	1,203,835	1,113,364	1,456,342	1,344,110	1,348,389	982,314
Centrifugal Pump	6,374,538	14,095,708	5,946,819	4,370,618	4,613,659	2,811,593

Note: (1) January - July
Source: INCOMEX

Table 3.83 EXPORT OF PUMPS

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
Value Reciprocating	-	-	-	8,480	6,000	-
Rotative Centrifugal	2,271	-	3,111	-	20	26,170
One Stage Other	841,384	1,106,554	2,285,155	1,549,741	1,110,671	320,804
Centrifugal Pump	225,891	580,186	372,502	332,351	476,252	237,810

Note; (1) January - July
Source: INCOMEX

Table 3.84 DOMESTIC PRODUCTION OF DIESEL ENGINE

Units: Quantity

Year	1983	1984	1985	1986	1987
Diesel and Semi Diesel	856	561	252	263	321

Source: DANE

Table 3.85 IMPORT OF DIESEL ENGINE

Unit: US$

Year	1984	1985	1986	1987	1988	1989 (1)
More than 35HP	1,803,081	10,506,520	5,189,830	2,196,429	2,901,616	2,488,468
Other HP Capacity	-	-	-	918,629	581,710	302,719

Note: (1) January - July
Source: INCOMEX

Table 3.86 DOMESTIC PRODUCTION OF COMPRESSORS

Unit: US$ 1,000

Year	Number of Units	Value of Sales in Factory
1974	910	710
1975	1,015	782
1976	914	849
1977	592	785
1978	628	569
1979	613	450
1980	378	511
1981	1,764	516
1982	10,066	2,124
1983	11,085	1,978
1984	13,616	2,555
1985	16,271	3,179
1986	18,963	3,952

Source: DANE

Table 3.87 IMPORT OF COMPRESSORS

Unit: US$ 1,000

Year	1980	1981	1982	1983	1984	1985	1986
Less 40HP	208	911	984	806	509	372	783
More 40HP	7,075	5,796	12,006	8,397	4,922	7,585	6,063

Source: DANE

Table 3.88 IMPORT OF COMPRESSORS

Unit: Quantity

Year	1980	1981	1982	1983	1984	1985	1986
Less 40HP	4,555	3,588	3,258	1,327	364	784	1,447
More 40HP	1,324	955	410	489	436	385	1,130

Source: INCOMEX

Table 3.89 THE MAJOR SUPPLIERS OF STEEL FURNITURE AND THEIR LOCATION

1)	BOGOTA	1- 1	INDUSTRIAR METALICAS CRUZ
		1- 2	INDUSTRIAR DE MUEBLES MATALICOS
		1- 3	INDUSTRIAS METALICAS AYZ
		1- 4	ESTMCTURAS TUBULERES LTDZ
		1- 5	INDUSTRIAS METALICAS RIVER
		1- 6	ESTAN — METAL
		1- 7	INMENZ LTDZ
		1- 8	MUEBLES STAR
		1- 9	MUEBLES MATALICOS FAMET
		1-10	FAMETAL BOGOTA
		1-11	INDUSTRIS METALICAS YZ
		1-12	EVDAL DE ACORO
2)	MEDELLIN	2- 1	MUNUFCTURS MUNOZ
		2- 2	MUEBLES URYECO
		2- 3	AEROPERFILES
		2- 4	METALICRGICS COMET
3)	C A L I	3- 1	INDUSTRIS RIOLDERS
		3- 2	MUEBLES CROMDOS DE OCCIDENT
4)	PALMIRA	4- 1	INDUSTRIAS METALICAS DE PALMIRA
		4- 2	MUEBLES PALMIRA
5)	BUCRAMANGA	5- 1	MUEBLES FISHER
		5- 2	ALCOOMO
		5- 3	INDUSTRIA COLOMBIA SREDNI
		5- 4	MUEBLES ATLANTICO
		5- 5	ICROMO
6)	PEREIRA	6- 1	MUEBLES IMPERIAL

Tabel 3.90 PRODUCTION OF STEEL FURNITURE

CIIU Code	Name of Production	Number of Units 1982	1983	1984	1985	1986	1987
38121014	Office Desk	20,832	22,715	21,595	19,496	17,386	19,348
38121022	Office Table	31,304	27,913	12,690	23,383	19,834	23,257
38121031	Offiece Chair	23,682	20,964	28,650	15,874	29,582	25,257
38121049	Swivel Chair	21,176	22,796	16,028	12,650	16,372	17,473
38121052	Book Case	12,371	11,928	11,851	12,523	10,351	10,427
38121081	Filing Cabinet	20,798	22,795	25,183	20,181	26,749	26,182
38122029	Poltroom	7,391	5,062	3,189	1,682	3,456	3,972
38122037	Sofa	7,933	6,046	7,090	6,298	8,365	8,983
38122045	Living Room Table	19,956	16,011	12,618	14,021	8,700	10,169
38122100	Dining Room Table	59,432	42,214	46,068	42,830	51,780	49,486
38122118	Dining Room Table	15,690	12,176	12,680	14,668	16,981	17,358
38122134	Auxiliary Little Table	37,648	41,438	63,132	24,968	16,619	16,631
38122207	Beds	47,895	51,812	38,812	45,484	39,193	42,225
38122215	Night Commode	12,135	13,646	10,632	11,091	8,889	6,977
38122231	Bedroom Armchair	14,591	13,787	8,026	7,489	13,958	9,438
38122240	Shelf	23,969	22,738	18,059	22,959	19,992	13,459
38122304	Kitchen Table	1,630	801	627	830	379	402
38122312	Kitchen Cabinet	15,092	20,377	17,173	21,990	21,279	24,124
38123347	Enameled Dishwasher	74,620	131,172	85,384	79,723	87,676	74,251
38122351	SUS Dishwasher	20,948	20,577	32,676	32,080	40,393	59,721
38122380	Bath Room Cabinet	7,254	8,728	7,235	22,875	7,635	12,977
38123025	School Shear	10,731	22,168	10,603	12,505	9,891	13,723
38123032	Writing Desk with Chear for School	4,554	13,392	10,293	8,539	4,395	8,534
38123041	Individual School Desk	2,517	15,084	11,407	13,793	18,584	22,527
38123050	Double School Desk	6,541	4,903	7,594	3,732	6,276	3,238
38123106	Hospital Bed	526	991	1,150	491	148	187
38123131	Hospital Chear	774	436	261	395	659	682
38123149	Laboratory Table	428	553	1,008	246	1,162	935
38120021	Showcase Hospital	17,188	16,328	21,629	18,493	22,931	27,262
38124030	Restaurant Chair	42,425	56,435	56,790	37,559	59,267	49,368
38124048	Restaurant Table	17,995	17,893	18,169	13,915	11,413	8,363
38124056	Restaurant Round Chair	2,552	5,432	5,175	7,046	8,256	3,242
38124072	Telephone Cabin	1,527	3,201	2,788	10,113	5,480	7,043
38129031	Furniture Parts	256,117	185,177	84,378	88,152	134,798	172,277
38129091	Other Metal Furniture	7,088	11,223	16,488	18,279	48,733	20,966

Source: DANE

Table 3.91 IMPORT OF METAL FURNITURE

Unit: US$ FOB

Nabandina Code	Type of Product	1984	1985	1986	1987	1988	1989 Jun.- Jul.
94010100	Automobile Seat	-	-	-	-	-	-
94018911	Chair and Similar	23,208	12,199	34,310	43,605	12,784	18,964
94030200	Other Furniture	116,132	23,049	89,530	67,408	128,505	312,027
	Includes Steel and Other Metals						

Source: INCOMEX

Tabel 3.92 EXPORT OF MATAL FURNITURE

Unit: US$ FOB

Nabandina Code	Type of Product	1984	1985	1986	1987	1988	1989 Jun.- Jul.
94010100	Automobile Seat	-	-	-	-	-	-
94018911	Chair and Similar	1,400	34,528	125	91,487	4,968	18,752
94030200	Other Furniture	24,545	28,948	12,055	29,917	32,212	92,272

Includes Steel and Other Metals

Source: INCOMEX

Table 3.93 PRODUCTION OF WOODEN FURNITURE

CIIU Code	Name of	Number of Units 1982	1983	1984	1985	1986	1987
33202016	Living Room Chair	26,469	25,868	29,946	32,062	35,057	42,481
33202024	Poltroom	8,912	10,337	10,754	13,349	16,639	19,287
33202032	Sofa for Living Room	12,673	10,999	14,119	14,679	16,685	21,664
33202041	Living Room Table	24,076	23,937	22,697	26,680	36,510	34,330
33202113	Dining Room Chair	68,268	65,516	68,756	69,375	82,647	104,179
33202121	Dining Room Table	15,713	20,664	18,879	19,756	24,418	31,491
33202202	Beds	32,183	35,514	40,634	50,676	47,665	54,608
33202211	Bed-Sofa	2,643	1,336	1,328	1,050	886	1,793
33202229	Night Commode	27,976	29,877	43,821	41,708	46,040	48,517
33202237	Dressing Table	10,295	13,907	14,122	13,451	15,909	18,929
33202245	Closet	3,348	6,469	8,992	6,941	5,191	7,828
33202253	Bedroom Armchair	9,115	7,423	8,250	7,741	7,973	10,161
33203012	Office Desk	22,104	20,625	22,207	18,840	34,947	48,191
33203039	Office Chair	31,689	23,679	23,737	35,982	18,427	36,181
33203047	Swivel Chair	7,301	10,098	10,434	4,138	5,700	9,882
33203055	Filing Cabinet	6,025	6,021	5,197	5,525	7,599	8,235
33203063	Book Case	6,355	8,991	9,240	9,854	8,748	9,948
33203128	Office Showcase	282	155	43	80	89	64
33203128	Show Case	2,141	2,540	85,384	79,723	87,676	74,251
33203211	Restaurant Chair	538	1,063	-	113	2,358	2,651
33203314	Double School Desk	1,433	2,598	4,461	6,262	4,910	7,319

Source: DANE

Table 3.94 IMPORT OF WOODEN FURNITURE

Unit: US$ FOB

Nabandina Code	Type of Product	1984	1985	1986	1987	1988	1989 Jun.- Jul.
94018901	Chair and Similar	77,258	100,235	266,711	244,029	97,956	31,634
94030100	Other Wooden Furniture	109,600	90,292	299,051	262,427	207,161	77,797

Source: INCOMEX

Table 3.95 EXPORT OF WOODEN FURNITURE

Unit: US$ FOB

Nabandina Code	Type of Product	1984	1985	1986	1987	1988	1989 Jun.- Jul.
94018901	Chair and Similar	428,695	2,380,850	4,350,671	1,730,903	582,068	276,540
94030100	Other Wooden Furniture	1,344,848	3,243,740	7,048,833	3,610,572	3,188,324	1,676,303

Source: INCOMEX

Figure 3.16 AGRICULTURE PRODUCTION (1970 - 1985)

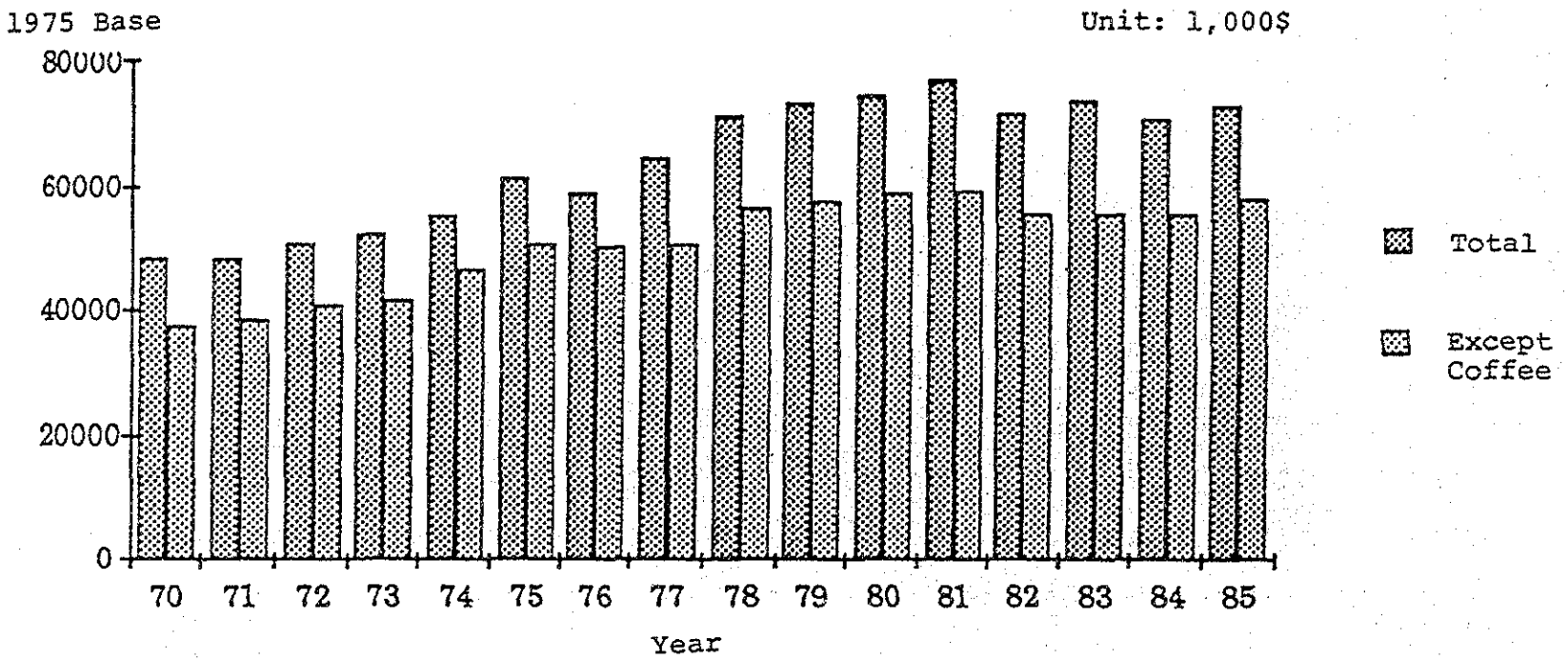
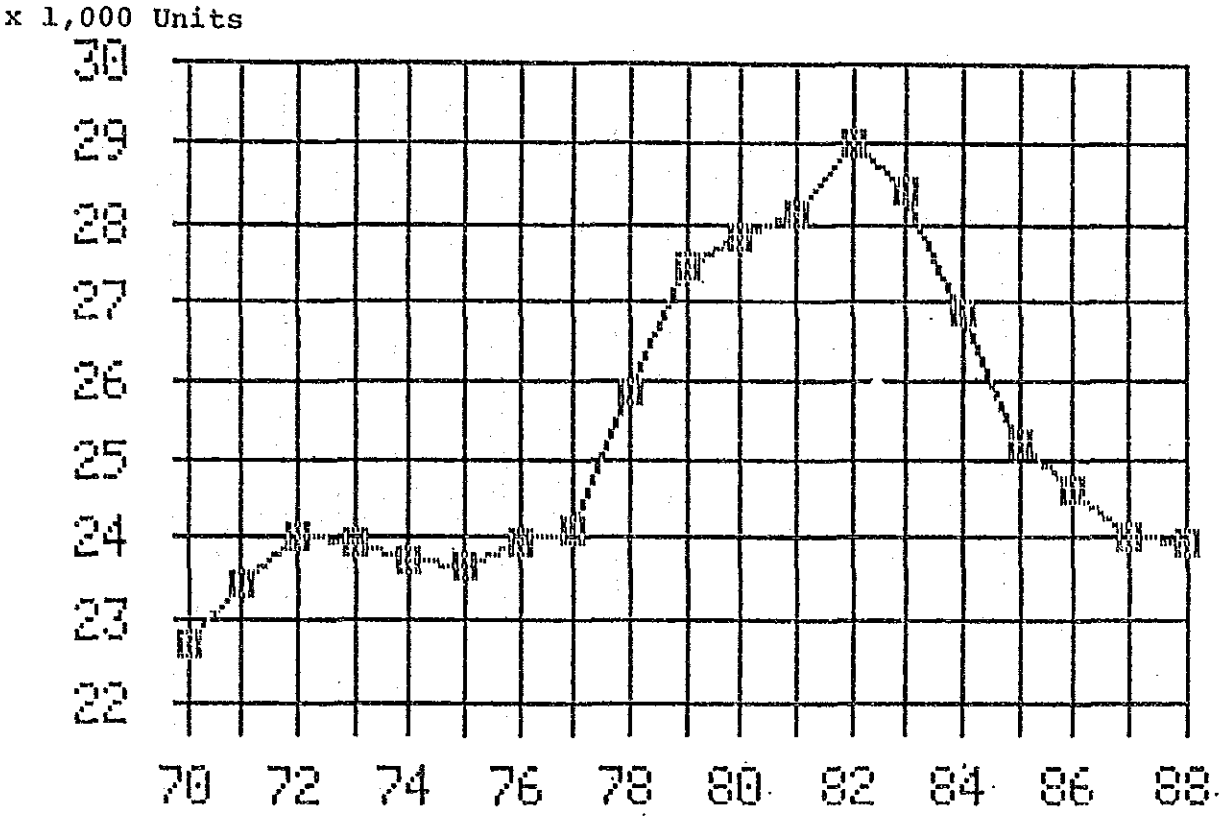
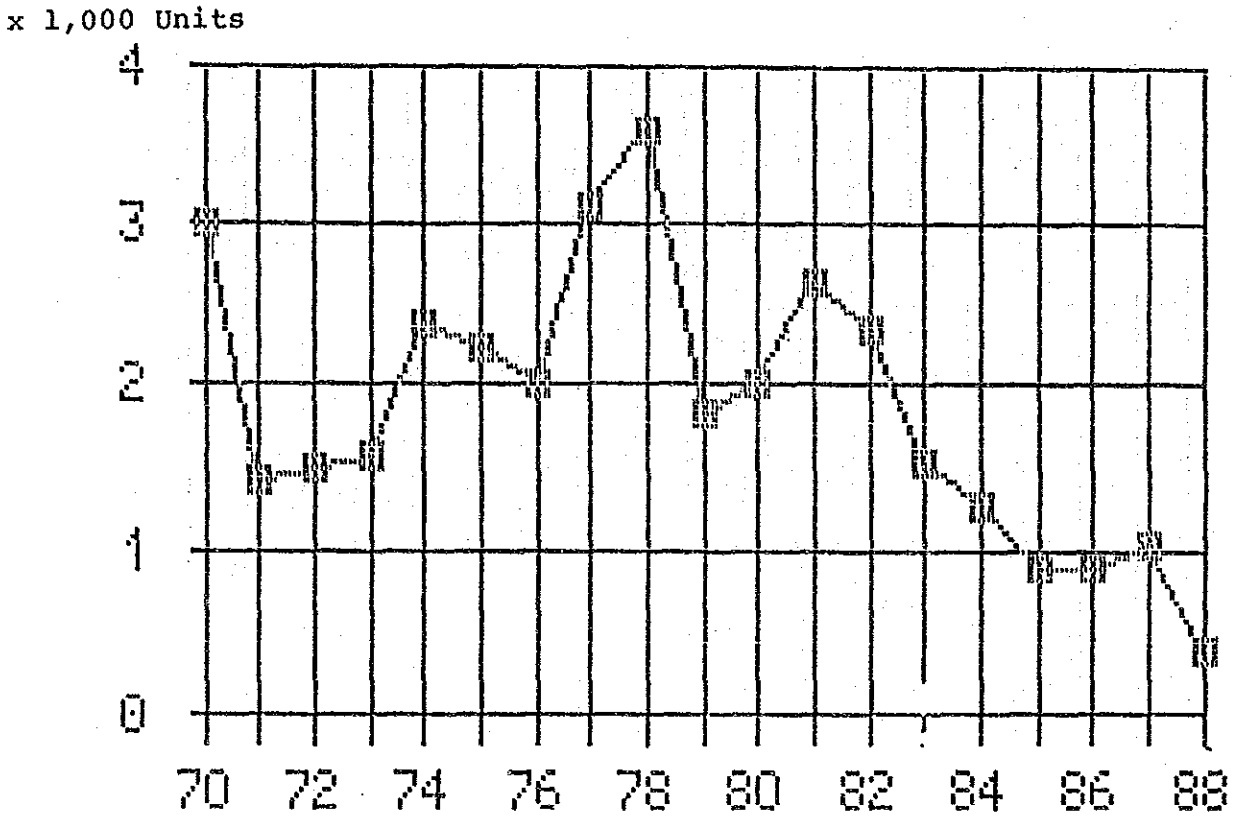


Figure 3.17 POSSESSION NUMBERS OF TRUCTOR



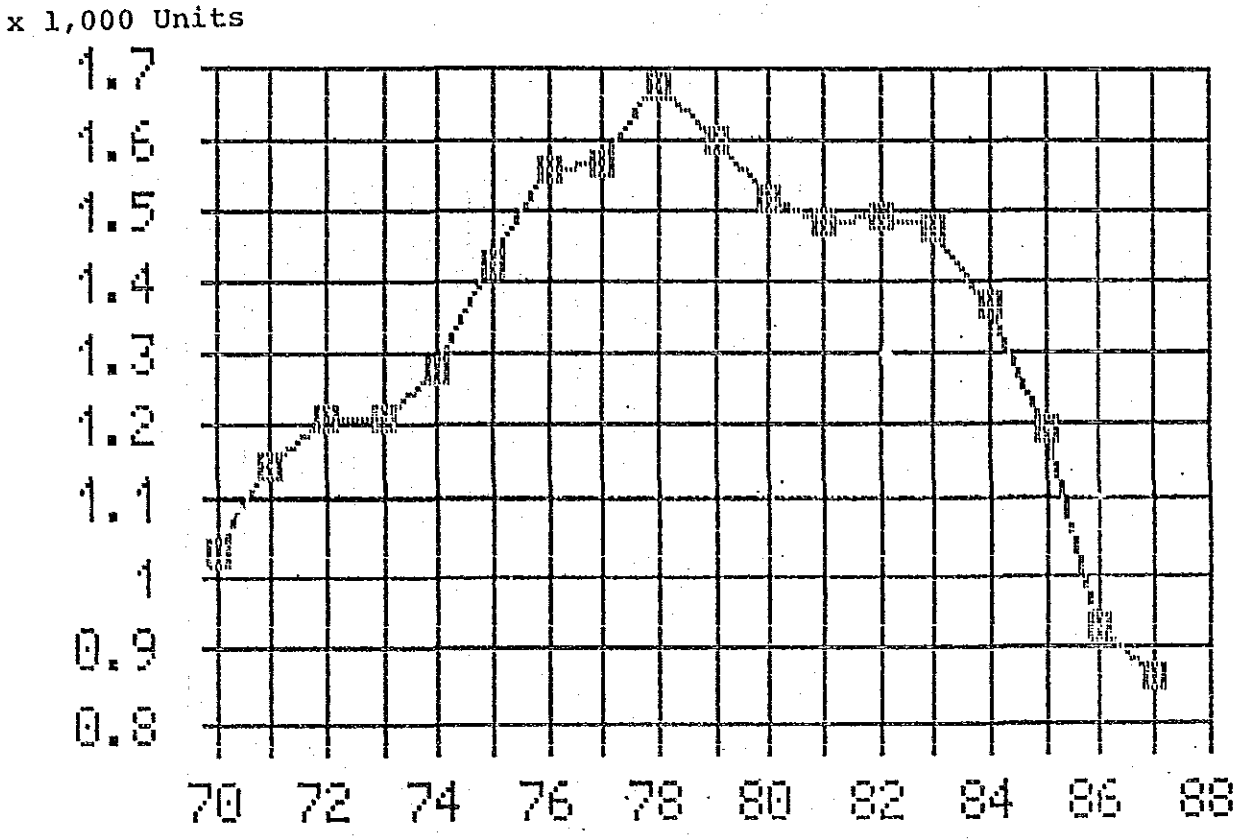
Source: DANE

Figure 3.18 IMPORTATION OF TRUCTOR



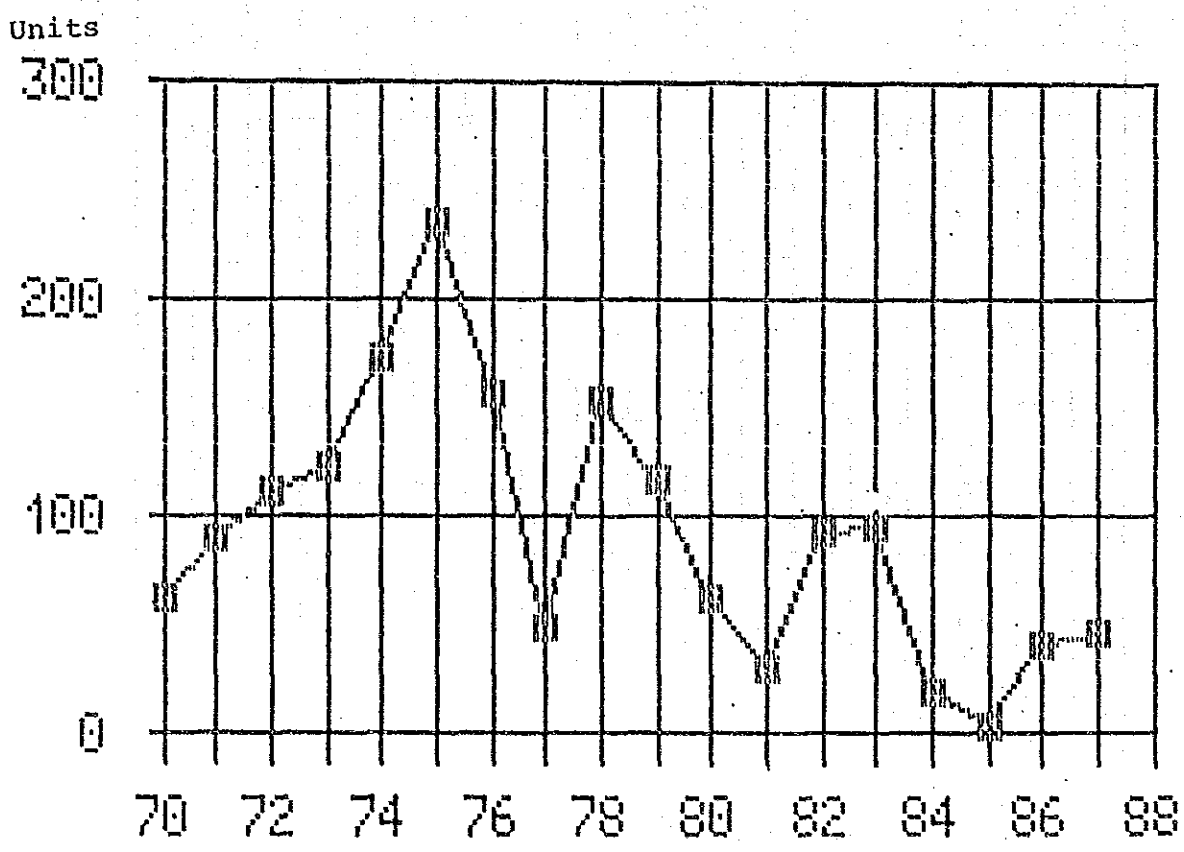
Source: DANE

Figure 3.19 POSSESSION OF COMBINES



Source: ADMAGRO

Figure 3.20 IMPORTATION OF COMBINES



Source: DANE