

REGIONAL DEVELOPMENT
UTILIZING MINERAL RESOURCES
IN VENEZUELA

by

Edel Jiménez B.

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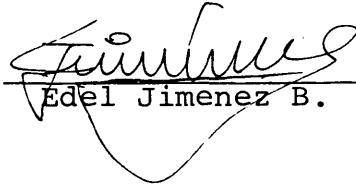
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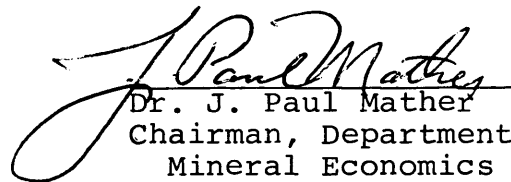
A Thesis submitted to the Faculty and the Board of Trustees of the Colorado School of Mines in partial fulfillment of the requirements for the degree of Master of Science in Mineral Economics.

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ABSTRACT

The Venezuelan government, because of its awareness of the country's dependency on depletable oil production, has attempted to diversify Venezuela's economic base through the exploitation of other natural resources. Regional development corporations for each of the nine regions of Venezuela have been designed to facilitate this exploitation. One of these is Corporacion Venezolana de Guayana (CVG) which operates in the Guayana Region.

As the Guayana Region is Venezuela's wealthiest mineral region, CVG is the regional corporation with the most economic resources and responsibilities assigned. Because of the importance of CVG and the Guayana Region in Venezuela's development scheme, an analysis to determine the effectiveness of CVG was made by the author.

The basis of this analysis is a study of the actions and plans of CVG in relation to its objectives. This leads to inferences as to the effectiveness of CVG organization and administrative structure in light of the achievement of its goals.

The analysis leads to the following conclusions:

a) CVG has been a very successful means for achieving regional development due to its efficient exploitation of mineral resources.

b) CVG has not succeeded in some important areas as a central development entity. It has not brought about a harmonious development within the region; industrial growth has far outstripped the growth of the socio-economic-urban infrastructure.

Based on the aforementioned conclusions, a number of recommendations can be made:

a) Remaining as the main agency of regional development, CVG should relinquish some of its present tasks, especially those related to the planning and construction of roads, schools, hospitals, etc.

b) All of CVG's offices should be located in Ciudad Guayana.

c) CVG should allow more self-guidance and direction in the subsidiary and mixed enterprises as a means of establishing a more competitive and creative system.

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INTRODUCTION

The Guayana Program represents the major efforts of Venezuela's present generation in regional development. This extensive governmental undertaking, scarcely a decade and a half old, is already having a profound impact on the regional and the national economy.* It is creating a new industrial area on the edge of the settled land in the eastern part of the country. It is expanding the productive capabilities of Venezuela by exploiting newly found resources, and is building a base of heavy industry necessary for further industrialization. It is stimulating economic expansion in other regions of the nation, and is serving as a powerful example to those regions of the possibilities of programming regional development.

The objective of this thesis is to analyze the effectiveness of Corporacion Venezolana de Guayana (CVG) as a vehicle for regional development in Venezuela, especially as related to development of the extensive mineral deposits in the area.

* Refer to Appendix A for a description of Venezuela.

The Guayana Region contains major iron ore, gold, bauxite, diamond, and tar sand resources as well as vast resources of hydropower that, if properly developed, could be an important base for diversification of production, stabilization of employment and income, and economic growth through integrated industries for the region itself and for the country as a whole.

In addition to the analysis of the government corporation, CVG, this thesis will investigate the many problems created by rapid economic growth in the Guayana area. These include the difficulty in providing facilities for education, transportation, and housing; the problem of adequate health care for the burgeoning population; and the rapid rate of inflation that has been in existence since the beginning of industrial development in Guayana. Also, an analysis will be done to evaluate the influence of the Guayana Region on adjacent regions also under development.

For purposes of economic development planning, Venezuela is divided into nine regions, each with its own development corporation. This study documents an analysis of Corporacion Venezolana de Guayana and its accomplishments during the period 1960-1977. CVG utilizes an important portion of the total funds allocated for development in Venezuela. For the period 1975-1980, the budget of CVG has been established at

32.641 million Bolivares (U.S. \$7.60 billion*). This amount almost represented the entire Venezuelan national budget for 1974 (1)**

The experience of CVG is unique in Latin America. There have been other regional development organizations such as the Tennessee Valley Authority in the United States and similar organizations in Iran and India, but the case of CVG is unique in the Western world and this, by itself, makes it more difficult to analyze the effectiveness of this organization. The method used here is to study the actions and plans of CVG in relationship to its objectives and to make inferences as to its effectiveness in light of the goals. The effectiveness is reviewed in relation to the organization and administrative structure of CVG.

The work of CVG in the mineral-wealthy Guayana Region is essential to Venezuela's plan for diversification of her economy. The importance of this thesis lies in its being one of the first efforts to analyze the overall effectiveness of CVG from its beginnings to the present. There have been a number of publications describing the annual activities of CVG, but only a few papers have attempted a more extensive

* All currency conversions are done at the fixed rate of Bolivares (Venezuelan Official Currency, Bs) 4.30 per U.S. \$1.00.

** Numbers in parenthesis refer to list of references beginning on page 118.

analysis. This study, with its emphasis on analysis, may serve as a guide for regional officials in future decisions concerning Guayana and for government officials planning for other areas in Venezuela.

The present study is limited to available information provided by government and private industries and by the time available for research in Venezuela. The conclusions of this study must be viewed in relation to these constraints.

The author's own visits to CVG offices in Caracas and in Ciudad Guayana, and his lengthy conversations with different CVG officials convinced him of the importance of this institute in the Venezuelan economy. Also, the author attempted to obtain information from other government organizations (another regional corporation, a coal mine, and a planning office) as well as private firms, and the difference between those places and CVG was highly noticeable; CVG greatly surpassed the others in the availability of information: annual reports, monthly bulletins, weekly letters, pamphlets, etc. Most of the materials discussed in this thesis came from the Department of Information and the library of CVG through its Public Relations Division.

THE GUAYANA REGION

General Discussion

The term "Guayana Region" is used ambiguously. Geographically, the name refers to the extensive highlands area--almost an island--that is bounded by the Atlantic Ocean on one side and separated from the rest of Venezuela on the other sides by the confluence of some of the largest rivers in Latin America: the Orinoco, the Casiquiare, the Negro, and the Amazonas. The traditional Venezuelan concept of Guayana generally includes all of the national territory to the south of the Orinoco River, a vast territory occupying nearly a quarter of the country's land area, as shown in Figure 1. The eighth parallel, together with the Orinoco, defines the region's northern boundary, and it extends southward into the equatorial belt. The region, therefore, lies entirely within the tropics.

The new legal concept of Guayana, embodied in the Decree 929 (2) establishing the Guayana Development Corporation, delineates only a narrow development zone on the lower Caroni River. More recently, through Decree 1331 (3) of Dec. 16, 1975, the Guayana Region has been expanded to include the State of Bolivar and the Delta Amacuro Federal Territory (4).

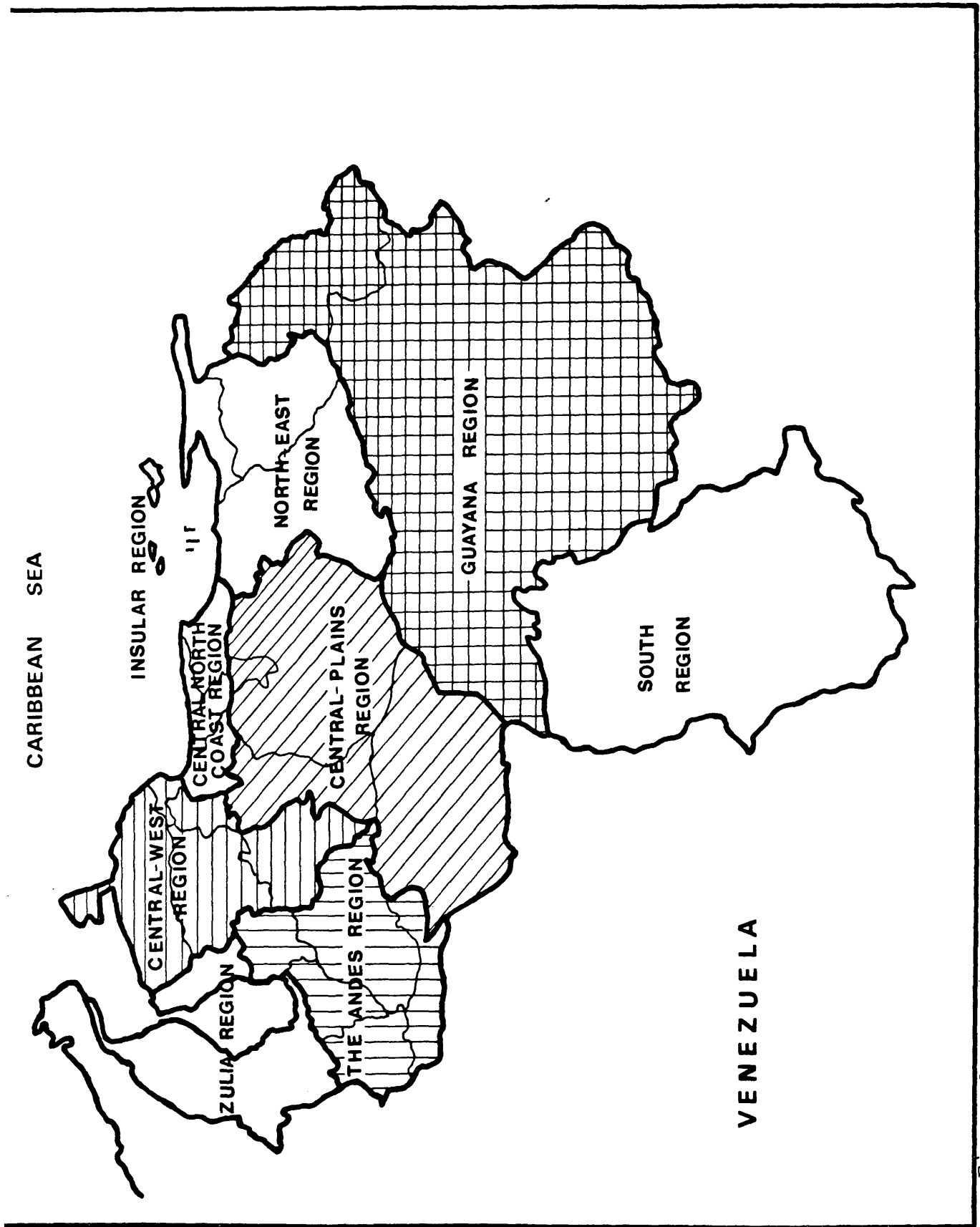


Figure 1. Venezuela: Regional Administrative Division.

At the core of this zone lies the city of Santo Tome de Guayana (formed by the old city of San Felix and the new city of Puerto Ordaz) where most of the industrial development occurs.

The Guayana Region, as delineated by Decree 1331, occupies an area of 125,000 square miles or twenty-three percent of the total national territory. It has a population of close to 400,000 inhabitants, or 4.1 percent of the national total. This population is chiefly concentrated in Ciudad Guayana, the largest city in the region; Ciudad Bolivar, the second largest city; and a scattering of towns, villages, and farmsteads in the upper Cuyuni Basin.

Ciudad Guayana is roughly 250 miles away from the metropolitan area of Barcelona-Puerto la Cruz, the largest urban complex and the only trade and service center in the entire eastern part of Venezuela. Caracas, the industrial, political, and administrative heartland of the country, lies almost 500 miles away from Ciudad Guayana by road.

Since its foundation (5), Ciudad Guayana (formerly known as Santo Tome de Guayana) has been the focal point for a series of interrelated industrial complexes that will in time transform the region's potential wealth of natural resources into a steadily rising level of living for the local population. At the same time, it will contribute to

the long-term strategy of national development in the form of diversified exchange earnings and intermediate product supplies to an expanding national market.

The Guayana Region has such a quantity and a variety of resources that it provides an ideal basis for the development of a large part of the industries needed by Venezuela for its full development. There is sufficient land for the multiple and evergrowing requirements of development; an ample supply of water for power generation and for industry; navigation, farming and human consumption; it has capacity to handle an intense river traffic of more than 900 ships per year by means of Ciudad Guayana's eleven port installations.

Locational Advantages

There are a number of advantages to the location of the Guayana Region:

Hydroelectric Potential

The Guayana area is a highly desirable location for big industrial complexes because of the aforementioned major rivers which border and flow through its territory, affording an unlimited amount of water for hydroelectric power.

The Caroni, Venezuel'a second largest river, has an average flow of 5,000 cubic meters per second. Along its 130-mile course before meeting with the Orinoco, the

Caroni offers a hydroelectric potential of more than 13,000 megawatts, one of the greatest of any of the rivers, in the world. The first project to be developed on the Caroni was the Macagua Hydroelectric Plant, which has been in operation since 1961 with an installed capacity of 370,000 kilowatts. The plant is located within the metropolitan area of Ciudad Guayana (6).

Besides the Guayana Region itself, the major markets for the hydropower generated in this area are Eastern and Central Venezuela--the latter including the capital city of Caracas--as well as certain areas in the western part of the country. Two tension transmission lines--a double circuit line of 230,000 and 400 megawatts which has been in operation for several years; and a more recent line of 400 volts which began operation in 1975--are making the energy of the Caroni River available in the previously mentioned areas.

Figure 2 shows the electrical transmission system that connects the Guayana Region with other regions of Venezuela.

The most ambitious project to date is the Raul Leoni Dam at the Necuima Canyon near Guri, about 60 miles up river from Ciudad Guayana. A power capacity of 9,000 kilowatts is to be installed there.

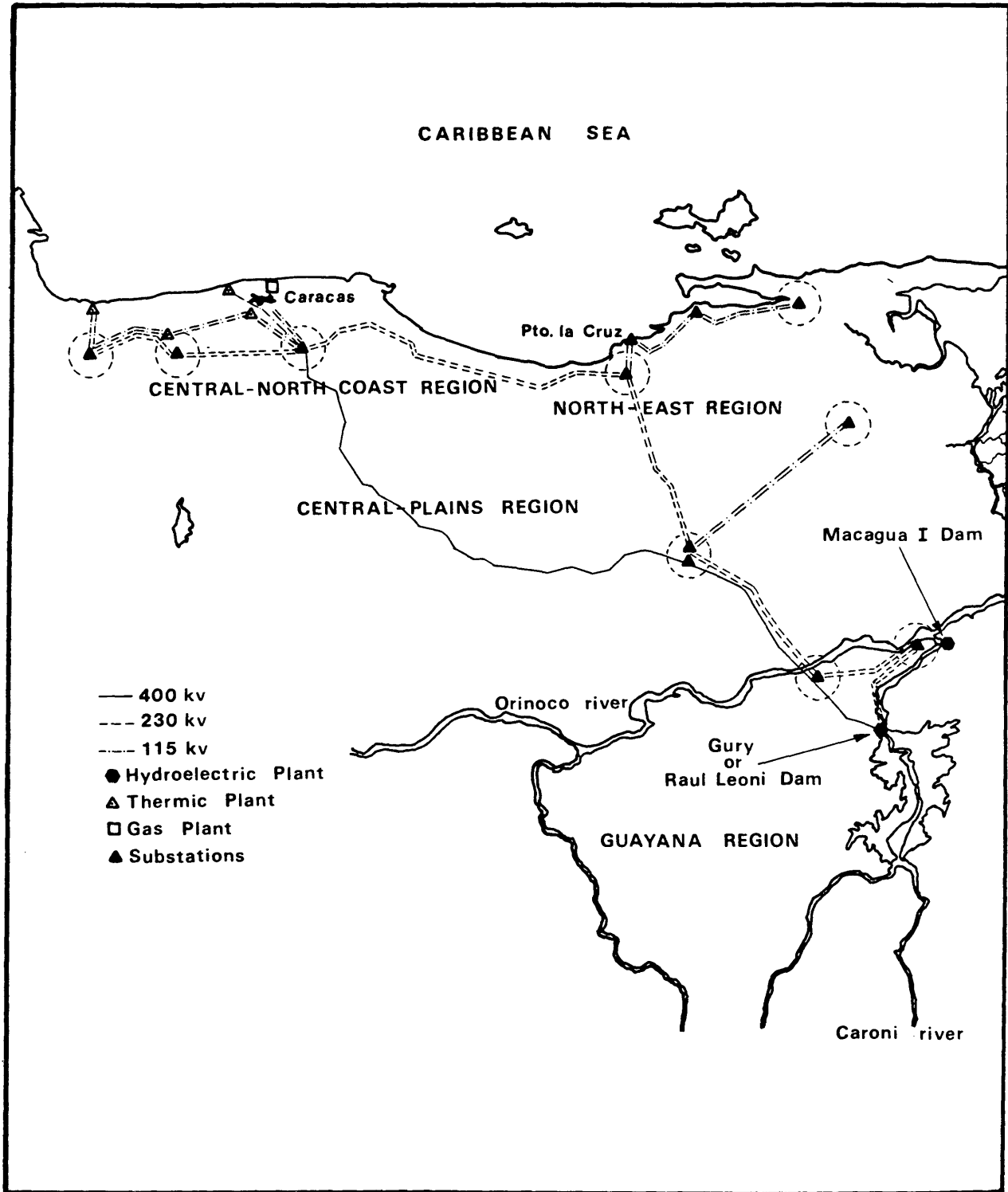


Figure 2. Electrical Transmission System that Connects Guayana Region and Other Regions.

Source: CVG, Edelca-Annual Report, Caracas, 1976, p. 84.

The initial phase of the Raul Leoni Dam was completed in 1968. It included three generating units with a combined capacity of 525 megawatts. The expansion work on the powerhouse began in 1971. With the completion of this stage, the installation of an additional seven units with a capacity of more than 2,800 megawatts was provided for. The sixth unit began operation during 1975, and a total of ten units were in operation by September 1977, completing Guri's first phase of development.

The final phase of the project consists of heightening the level of the reservoir by approximately 165 feet. To accomplish this, it will be necessary to raise the current 320-foot dike to a 450-foot altitude and to build a new dam with a second powerhouse.

Upon completion of the final phase, the reservoir will cover an area of 1,545 square miles and hold 140 billion cubic meters of water; with the installed capacity, the dam will possibly become the world's largest dam insofar as power generation is concerned. During the five-year period from 1975 to 1979, investments in hydroelectric development will be nearly \$3 billion. The electricity generated by these complexes is among the cheapest for industrial use in the world (7).

Mineral Resources

Iron Ore. The exploitation of iron ore in the Guayana Region is at a pioneer stage. Before the formation of CVG, commercial mining of the rich iron ore deposits at El Pao and Cerro Bolivar commenced in the early fifties. These concessions were held by Bethlehem Steel and U.S. Steel Corporations.

The iron from Guayana is important to the region's economy and to the economy of the country as a whole; iron ore activity is the second main source of revenue in Venezuela, although far behind the oil activities (see Table 1). The main deposits of iron ore are located in the iron belt of the Imataca Complex, extending from the Orinoco Delta to the Orinoco Valley in the state of Apure, an area encompassing an estimated 58,750 square miles.

In January of 1976, the reserves from iron ore were estimated at 2,071 million metric tons with an iron content higher than 55 percent (8). If Venezuela's rate of production were 20 million metric tons per year, she would have reserves to last for about 100 years, not including the reserves with an iron content lower than 55 percent. At present there is an installed capacity of 28 million metric tons per year with the deposits of San Isidro, Cerro Bolivar, and El Pao being the only centers of active exploitation.

Table 1

Venezuela: Exportations 1959-1974
(million dollars)

<u>Year</u>	<u>Iron Ore</u>	<u>Petroleum</u>	<u>Others</u>	<u>Total</u>
1959	100.2	1,547.4	53.72	1,701.4
1960	122.3	1,454.4	128.60	1,795.4
1961	97.0	1,590.0	40.0	1,727.0
1962	87.2	1,683.7	49.1	1,820.0
1963	71.6	1,678.1	70.9	1,820.7
1964	109.2	2,357.8	80.0	2,523.7
1965	125.6	2,359.1	56.1	2,540.7
1966	126.0	2,266.5	62.8	2,455.4
1967	120.7	2,442.8	85.6	2,649.1
1968	105.1	2,468.8	80.5	2,654.4
1969	133.0	2,484.0	90.9	2,708.0
1970	150.7	2,551.8	117.2	2,820.0
1971	147.0	3,134.6	169.5	3,451.2
1972	131.4	3,509.3	143.3	3,784.0
1973	184.6	5,187.4	127.7	5,458.0
1974	266.5	14,327.7	261.6	14,857.0

Source: Ministry of Energy and Mines, 1976, Annual Report, Caracas, Ministry of Development, General Office of Statistics, Caracas, p. 12.

All of the output of iron ore in Venezuela has come from Cerro El Pao, Cerro Bolivar, and Cerro Altamina with the largest proportion coming from Cerro Bolivar and Cerro Altamina. In 1975, they had a production of 22 million metric tons over a Venezuelan total production of 24.7 million metric tons. Tables 1 and 2, in Appendix A, show the iron ore reserves and the production of iron ore reserves and the production of iron ore by deposits, respectively.

The exploitation of iron ore and its conversion into steel and finished steel products constitute the core of the Guayana economic development program. CVG has developed an iron and steel industrial complex (shown in Figure 3), that has already contributed to Venezuela's efforts to diversify its economy, which in the past has been almost exclusively dependent on oil revenues.

The Guayana iron and steel industrial complex consists of different companies such as: 1) Ferrominerao, a company operating the various iron ore deposits; 2) Minorca and Fior, two reduction plants that process the 10 percent of Ferro minera iron ore that is not exported to other nations; 3) Sidor, an integrated steel mill plant; 4) Venbozel, a ferrosilicon plant; 5) Cementos Guayana, a cement plant which uses slag obtained from the steel mill plant in its casting process; 6) Edelca, the company in charge of supplying

electric power to the region; and 7) Corporacion Venezolana de Petroleo (CVP), the company that operates the oil industry supplying natural gas to the industrial complex. CVP is located in the North-East region.

The effects of these industries on the region and the country as a whole are measured through their contribution to exports, gross national product, employment, and investments (refer to Tables 3 and 4 in Appendix A). Specifically, the following criteria are used:

- 1) The proportion of total exports arising from production within a specific industry.
- 2) The proportion of gross national product contributed by the industry.
- 3) The total employment generated within the industry.

Bauxite. The aluminum industry is basic to the Guayana development scheme. Up to the present, however, the main raw material for aluminum production, bauxite, has had to be imported. But in August 1977, CVG announced that major bauxite deposits had been discovered in Guayana (9). These new deposits will have a great influence on the developing aluminum industry.

The largest bauxite deposit is located in the Sierra Los Pijiguaos, about 250 miles west of Ciudad Guayana, in the Cedeno district of the state of Bolivar. According to CVG, the deposit contains an estimated 500 million metric tons of 48.9 percent alumina. At least 50 million metric tons of more than 50 percent alumina have been confirmed in a pilot zone (10).

Before the discovery of the Los Pijiguaos deposit, CVG undertook the establishment of an aluminum industry because of such conducive factors as the high hydroelectric power potential of the region and the proximity to some of the main producers of bauxite such as Surinam, Guyana, and Jamaica. The discovery of bauxite at Los Pijiguaos was the direct result of efforts in the region to establish an integrated aluminum industry.

Figure 4 shows the planned composition of the future integrated aluminum industry: 1) a company to exploit but not export bauxite; 2) Interalumina, an aluminum plant already in existence to process bauxite and produce up to one million metric tons of alumina; and 3) two aluminum plants to attempt to meet the domestic demand for aluminum products as well as to export aluminum products to other South American countries.

The dollar value of the aluminum industry is of small importance today, but in the future, it will be much more important. By 1980, the region will be producing up to

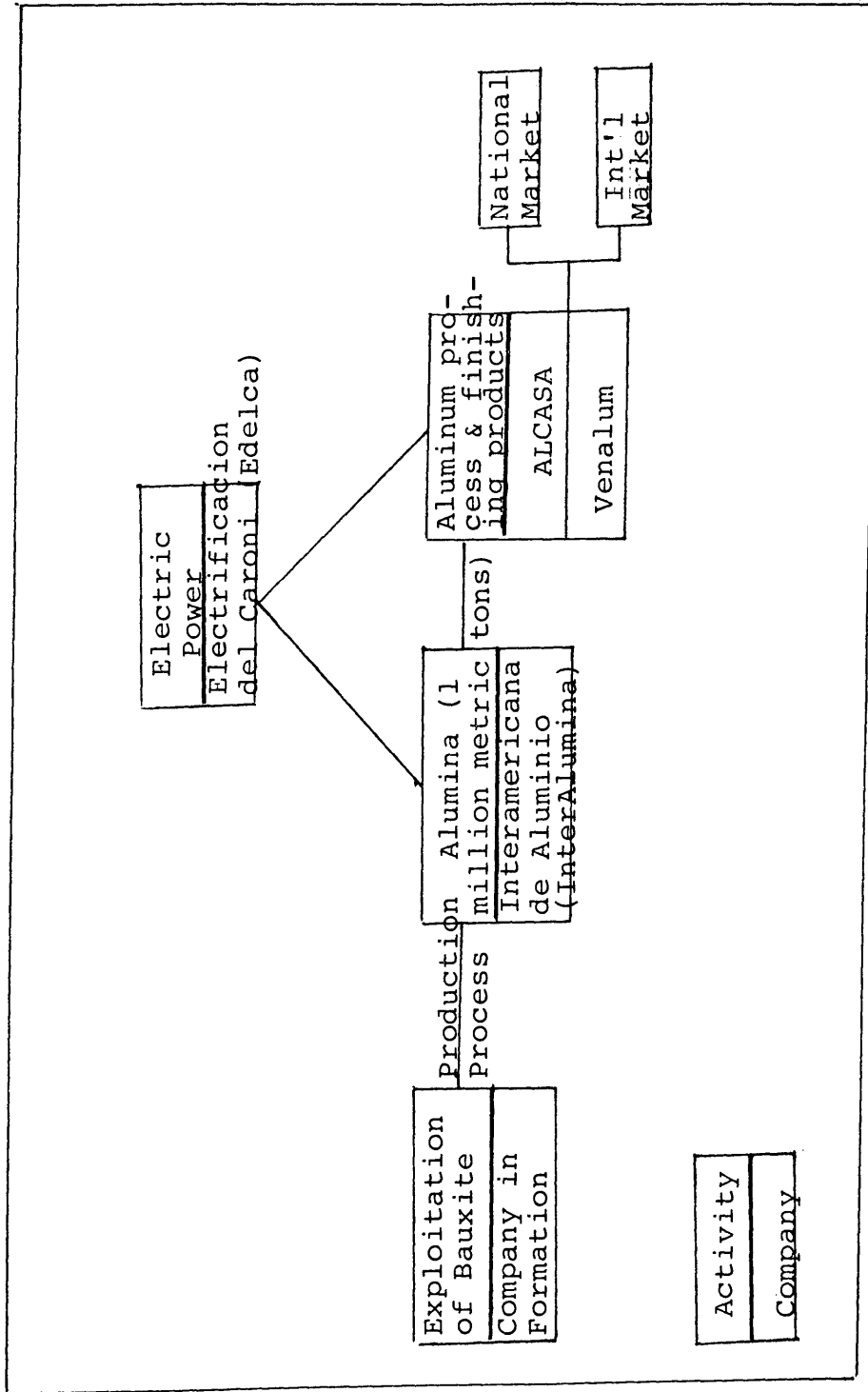


Figure 4. Aluminum Industrial Complex of Guayana.

400,000 metric tons of aluminum (11), which having a large effect on the economy of the region and the country. This effect will be represented by: 1) the multiplier effect of the new activity in the region, and 2) the substitution of imported bauxite because of the exploitation of the Los Pijiguaos bauxite deposit. This by itself has the effects of converting the Venezuelan aluminum industry into an integrated one and of generating products for export.

Gold. The mining of gold is one of the oldest activities in the Guayana Region, especially in El Callao, in the state of Bolivar. The industry is not very well developed and obsolete technology is used in both exploration and exploitation. Because of the lack of adequate exploration, the gold reserves are very poorly defined.

In 1975 the government, through its comprehensive plan for development of the region, created Minerven, a company dedicated to the exploration for and exploitation of gold (12). Minerven is developing the Colombia Gold Mine. This work includes the creation of an industrial infrastructure: a source of water for the mine and the plant, electric power, mining towns, etc.

Diamonds. Although the existence of diamonds in the state of Bolivar has been known for some time, the techniques for exploring and exploiting diamond fields are as obsolete as those used in the gold reserves. Only recently has the

government decided to implement a program to re-orient diamond mining activities which have been long in operation with a minimum of efficiency. This program, developed in the area known as Guaniamo, includes the organization of diamond production and infrastructure facilities such as roads, telephone, telegraph, mail service, and health facilities.

CVG has given little attention to gold and diamond activities because of the lack of more technical information concerning those resources, and also because CVG is more interested in promoting a fast development of the region, which cannot be achieved through the development of those activities. So it has devoted most of its efforts to the development of an iron and steel industry. However, the resources of gold and diamonds constitute a good challenge for CVG in its goal of diversifying the economic base of the region and exploiting the natural resources. This could be done through the promotion of these resources as a means of incentive to the private sector for the undertaking and development of these resources.

Other Natural Resources. The mineral-rich Guayana Region covers an immense area; thus, it is very difficult for Venezuela with such limited mining experience to make a complete reconnaissance survey of all potential resources. However,

the regional development agency, in conjunction with other government agencies, has been making some land surveys which have led among other things to the aforementioned discovery of bauxite deposits. Some deposits of kaolin, which could be used in refractory bricks, have also been located. These deposits will supply the increased amounts of refractory bricks which will be needed for the expanding aluminum industry. Quartz, useful to the ferroalloy industry in producing ferro-silicon, and dolomite, used for neutralizing or feeding soil have also been discovered. The dolomite with low silice content will be useful in the steel industry.

Even when the previously listed mineral discoveries do not generate a large industry in themselves, they are of great importance to the existing industries.

Natural Gas. While the Guayana Region has a very high potential of hydroelectric power, only a part of which is being used to satisfy the needs of most industrial complexes in Ciudad Guayana, some industries use natural gas as an alternative source of cheap energy. Most of this gas goes to feed the steel plant which uses a reduction process based on natural gas. The use of gas in the Guayana Region is not intended to substitute the electric power generated in the region, but it represents a way of using the vast amount of natural gas of the North-Eastern Region which was being flared into the air because of the lack of the necessary industries for processing it.

Ciudad Guayana is situated within 30 miles of producing oil fields and within 160 miles of natural gas supplies and sources and is linked to these hydrodeposits by pipelines. These pipelines come from the North-East Region and have a capacity of 4.2 million cubic meters per day. At the present, there are plans to increase that capacity to reach the level of expanded regional demand.

Even though this natural resource is not located in the Guayana Region, it serves as an example of how natural resources can be utilized in interregional development.

Industrial Infrastructure. The existence of large tracts of land and the port, road, railroad, and other facilities make the Guayana Region desirable for the undertaking of mining, metallurgical, or any other kind of industrial project. In addition, the zone is connected to the rest of the country through a system of well-maintained roads.

The Orinoco River is dredged continuously and can be navigated by ships up to 80,000 metric tons in capacity for eight months of the year. In the four months when the river is at a lower level, it is navigable for ships up to 50,000 metric tons in capacity. Ciudad Guayana, the principle city on the Orinoco, is an international port 180 miles from the Atlantic Ocean.

Figure 5 shows some of the natural resources and road infrastructure of the Guayana Region, while Figure 6 shows the Boca Grande Channel which connects the region with international markets.

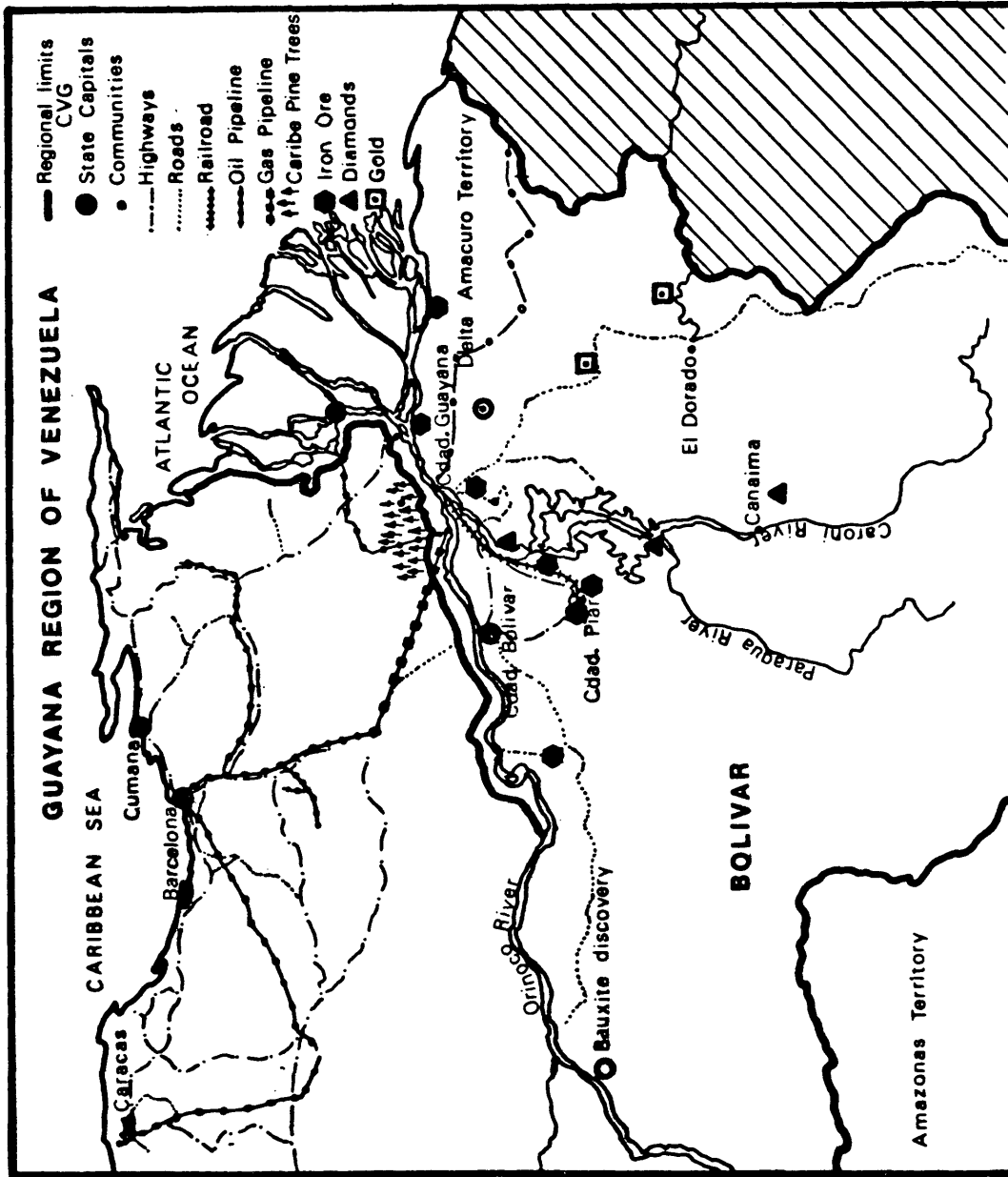
Relations with Other Regions

The influence of the Guayana Region is most evident on its neighboring regions: the North-East, the Central Plains, and the South; but the whole country is affected by this emerging region. Figure 1 shows the states and regions of Venezuela.

The North-East Region

This region is formed by the states of Anzoategui, Monagas, and Sucre. Each state has a separate and distinct relationship with Guayana.

Anzoategui. Anzoategui is a state characterized by commerce and industrial activities in the North, and agriculture in the central and southern parts. In the past, there was great activity in the exploration and exploitation of oil and gas; however, at the present, activity is limited to the production and shipment of oil and gas to foreign countries. Its harbor facilities, which can load five tankers at the same time, are located at the Puerto La Cruz Bay.



Source: Engineering-Mining Journal, Vol. 78, No. 11, November 1977, p. 54.

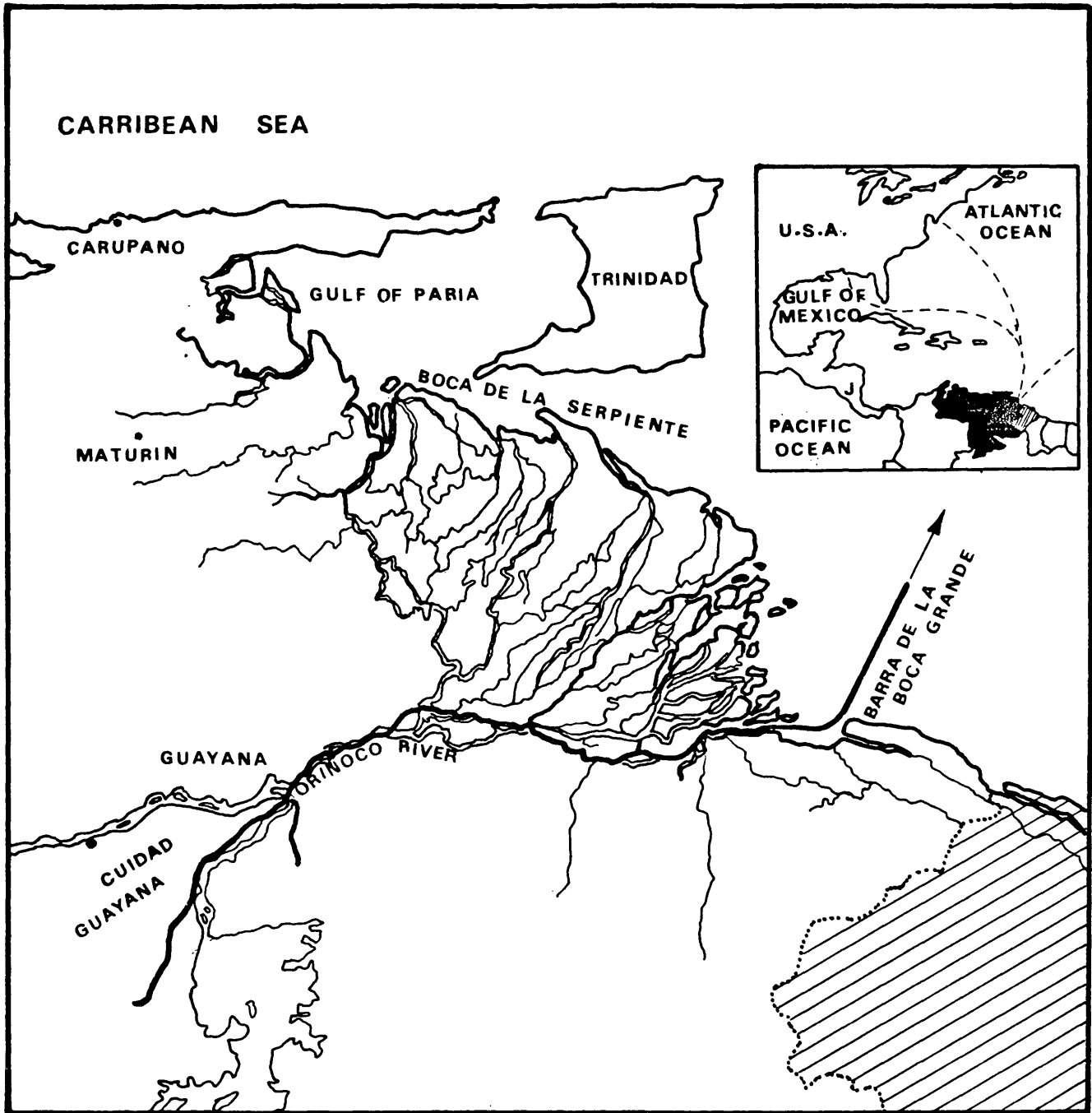


Figure 6. Boca Grande Channel.

Source: SIDOR, Informa Anual, 1976, p. 34.

The state of Anzoategui supplies all the gas that is used in the Guayana Region through a 180-mile pipeline. Plans have already been made to increase the shipment of gas to the Guayana Region as a means of satisfying the demand generated by the projects included in the industrial development program of the Guayana Region for 1975-1980, especially the expansion plan of the steel industry and the two reduction plants, Minorca and Fior.

Another source of relations between this state and the Guayana Region is the coal mine at Naricual and the cement plant at Pertigalete, both located in the northern part of Anzoategui. Because of the increasing development of Guayana and the accompanying increase in need for raw materials, the operation of the coal mine at Naricual has been resumed, after it has been closed for several years. The production of this mine concentrates on coke to meet the needs of Guayana's iron and steel industry and some other projects. This coke production is estimated to be 250,000 to 300,000 metric tons per year after the year 1980. Current, the coal mine is in a redevelopment stage and a preparation plant is being installed (14).

The cement plant at Pertigalete has shipped a large percentage of its production to Guayana. The plants within Guayana have not been able to cover the total demand

for cement because of the high level of construction there.

All these activities together with others such as commerce and agriculture cause an economic impact within the state of Anzoategui due to development in the Guayana Region.

Monagas. The state of Monagas is mainly an agricultural state with a considerable level of oil activities. This state and Anzoategui are separated from the Guayana Region by the Orinoco River.

The Guayana Region has relations with Monagas through a pine tree planting scheme at Uverito, in the southern part of Monagas. The project has the double purpose of contributing to reforestation of the area and producing raw material to make long-grained wood pulp for a pulp and paper factory that will be established in the area to serve the needs of Guayana. Up to the year 1977, a total of approximately 65 million pine trees were planted.

The planting stage of the project will end in 1984, the target being to plant 160 million trees over an area of 350,000 acres. By 1979, 250,000 acres will be planted in the Delta of the Orinoco at an estimated cost of \$7 million. During the same five-year period, another 250,000 acres will be planted with Caribbean Pines, adding 70 million pine trees to the existing quantity covering a total area of 200,000 acres.

(15).

Although this program is totally financed by CVG, most of the workers and construction equipment and materials originate from Monagas, thus stimulating economic activity in this part of the state.

Sucre. The main activities in this state are related to fishing and agriculture. Sucre does not have mineral or other resources to attract the Guayana Region's interest and aid. There used to be port facilities on the coast to provide shipping facilities for CVG's iron ore and alumina; but operations were ceased since the dredging of the Orinoco has made Ciudad Guayana a more adequate port city. In any case, the dredging of the Orinoco did not have a major effect on the state, considering the limited amount of activity that it had.

All the electric power used within the state of Sucre, as well as the states of Anzoategui and Monagas, is generated from plants within the Guayana Region.

The Central Plains Region

The Central Plains Region is formed by the states of Guarico, Cojedes, and Apure. This is a very poor region with a paucity of natural resources and its main livelihood is cattle raising and agriculture.

Relations between Guayana and this region are maintained through the use of electric power generated in Guayana by these three states, and the flow of agricultural products entering the Guayana Region and originating in the Central Plains Region.

The South Region

This region is entirely composed of the Amazonas Federal Territory. This area is practically unknown because it is largely jungle. Nevertheless, the government is undertaking some studies in order to obtain more information from this area. Also, CVG has developed some exploratory programs, but these penetrate only the border areas.

The Coast-Center-North Region

This region is composed of the Federal District, and the states of Miranda, Aragua, and Carabobo. This region is the main center of Venezuela's population with 60 percent of the total. It is also the industrial center and has a high level of agricultural activity, both using sophisticated technology. Here again, the importance of the Guayana Region is as a source of energy and as a generator of indirect employment in the corporate center of Caracas.

A general scheme of the Guayana Region's relations with other regions is shown on Figures 7 and 8.

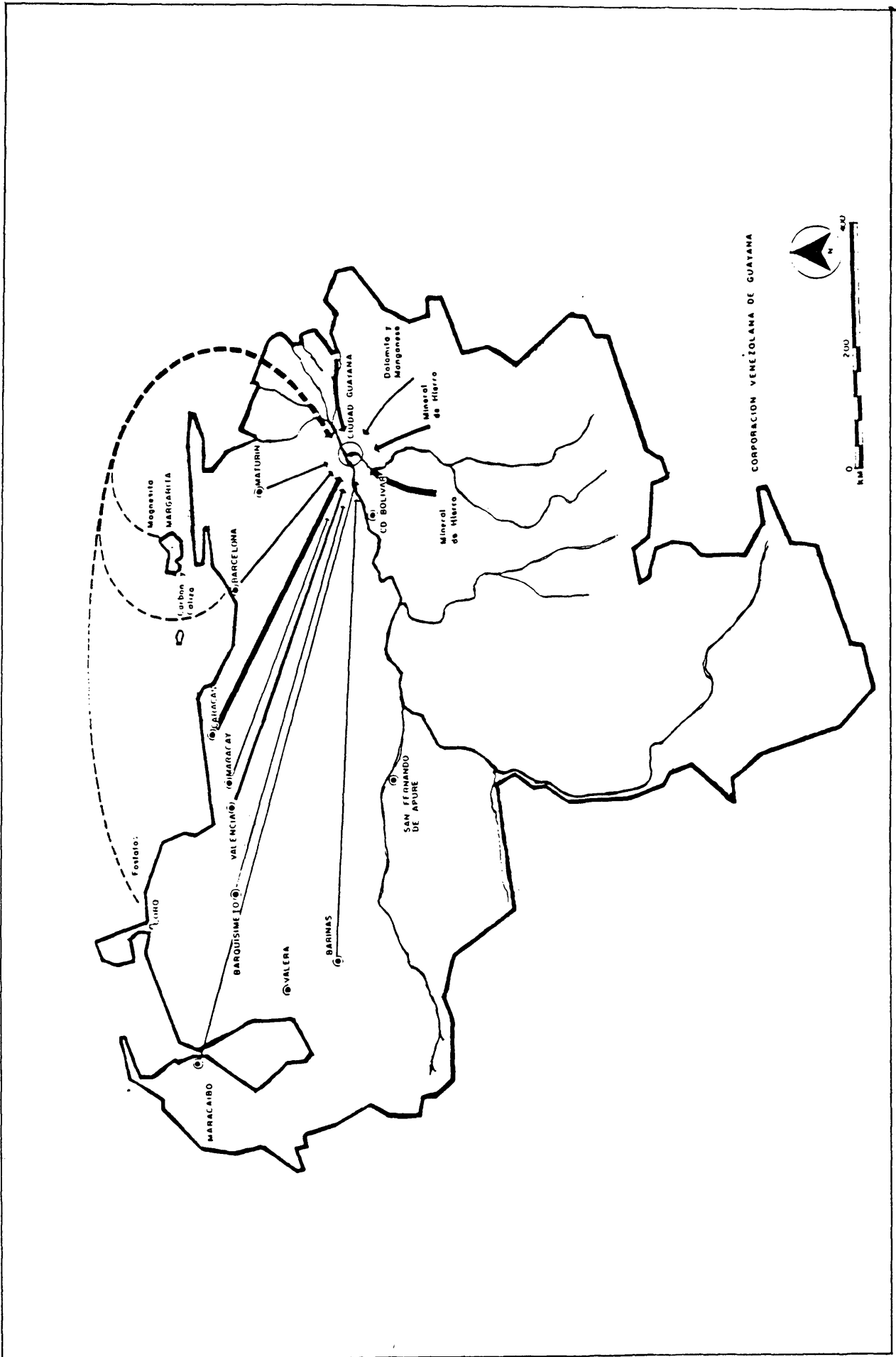


Figure 7. Origin of Commodity Flows Entering the Guayana Region in 1975.

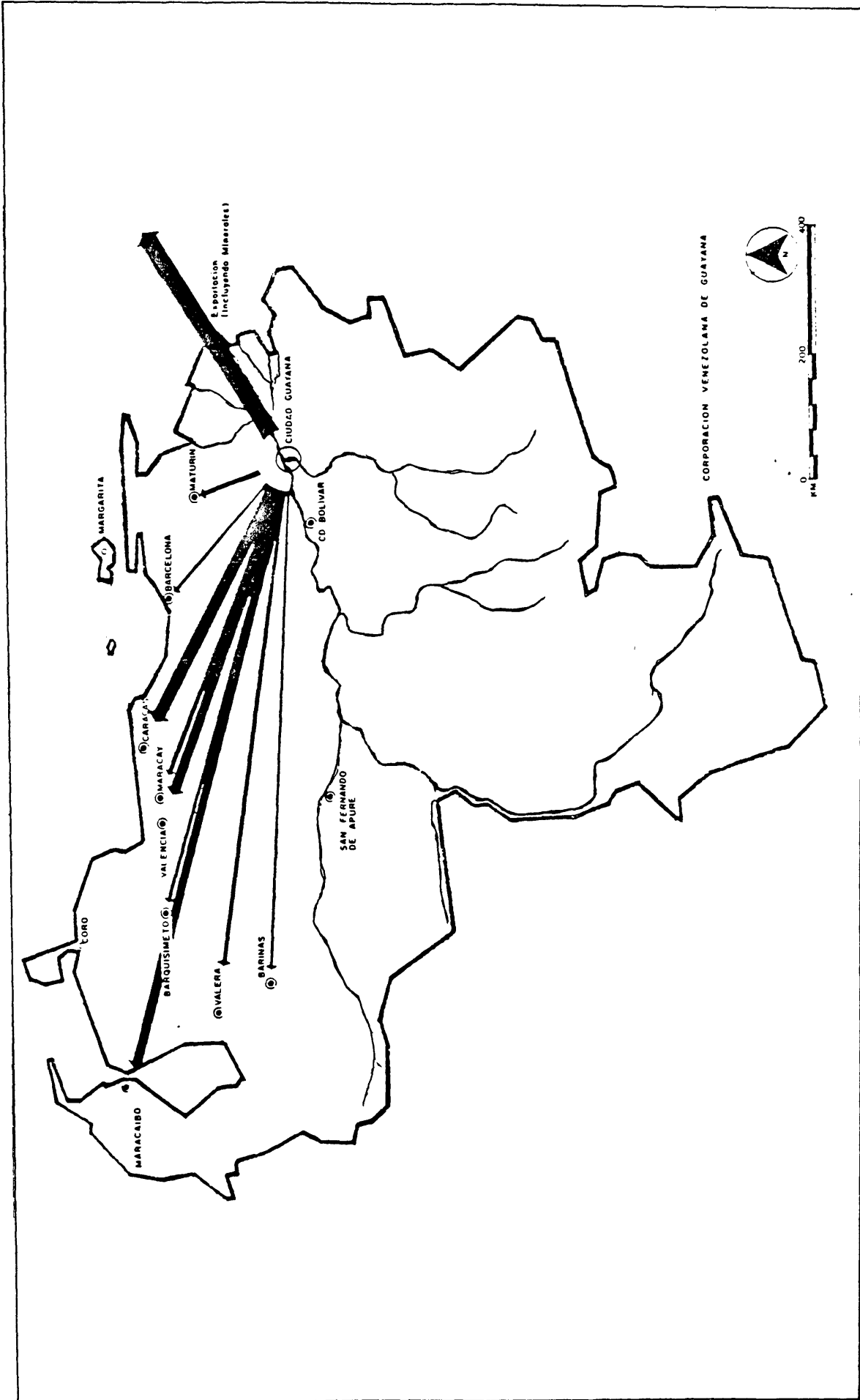


Figure 8. Destination of Commodity Flows Originating in the Guayana Region in 1975.

CORPORACION VENEZOLANA DE GUAYANA

General Considerations

CVG plays an essential role in the economic development of Venezuela. Its importance is recognized through the allocation of a very large portion of the national budget. The impact of CVG on the Guayana Region's economy is greatly due to the large government expenditures, many of which are oriented toward mineral development.

The CVG group is second only to the oil industry as chief contributor to the Venezuelan gross national product. For example, during the year 1976, CVG had over 20,000 employees, assets of 3.2 billion dollars, and profits of \$380 million; its participation in the gross national product was around \$1.3 billion or 4.55 percent of the total (16).

During its first years of operation, CVG carried out an industrial and socio-economic program. But since the early 70's, the needs and demands of the area have exceeded the facilities of the existing infrastructure. The problems created by this situation will be studied in detail in Chapter 5.

Antecedents

The first systematic studies dealing with the Guayana Region were made in 1948 when Corporacion Venezolana de Fomento (CVF), the Venezuelan Development Corporation, began an evaluation of the hydroelectric potential of the Caroni River. The results of this study and some others, which were done by foreign consulting firms, lead to the creation of the Commission of Studies for the Electrification of the Caroni River in 1952. This commission was responsible to the Ministry of Development. During the same period, an iron development group was formed which initiated some studies in order to install a steel mill plant on the Orinoco. Later, when the government created the Special Studies Commission of the Presidency of the Republic, this group passed along its findings to the commission.

The development of Guayana began in the early 1950's when mining companies began extracting iron ore from El Pao and Cerro Bolivar. The companies involved were the Orinoco Mining Company and Iron Mines Company, which were subsidiaries of the U.S. Steel Corporation and the Bethlehem Steel Corporation, respectively. Also at that time, the government initiated a systematic study for installation of a hydroelectric plant and a steel mill along the Caroni River. In addition, a deep channel, 250 miles in length, was dredged through the

Orinoco River Delta for oceanbound vessels. Two large ports for shipping iron ore were built at the junction of the Orinoco and the Caroni. The iron ore deposits were joined to the ports by railroads, the one from the El Pao deposits being 44 miles long and the other from the Cerro Bolivar being 94 miles long.

The year 1956 saw increased development and expansion in Guayana with the construction of the hydroelectric center, Macagua I, being started on the lower falls of the Caroni River and an iron and steel plant initiated on the Orinoco, ten miles away from San Felix on the opposite shore. This steel mill was later named Siderurgica del Orinoco (SIDOR). At this time the development of the community of Puerto Ordaz had already begun in order to lodge the workers and technicians of one of the area's iron companies.

In 1958, the Venezuelan Institute of Iron and Steel had its beginnings as an autonomous institute. Among its functions were to finish the construction and start the operation of the aforementioned iron and steel plant. During the same year, the Commission of Studies for the Electrification of the Caroni River was transferred to the Venezuelan Development Corporation which was still administering the construction of the Macagua I dam (17).

In August 1959, by Presidential order, the post of "Commissioner of the Presidency of the Republic for the Guayana Retion" was created with the responsibility among others of

"formulating jointly with the Central Office of Coordination and Planning the necessary recommendations for creating the permanent organization that should take care of leading the economic activities of the public sector, and of orienting the economic activities of the private sector in order to force the development, dynamic and integral, of the region." (18)

Finally, as the result of the recommendations formulated by the Commissioner's office and the Central Office of Coordination and Planning on December 29, 1960 by Decree Number 430, the Corporacion Venezolana de Guayana was formed (19). It took over all the assets, power, and responsibilities of the Commission of Studies for the Electrification of the Caroni River and of the Venezuelan Institute of Iron and Steel.

Area of Operations

Decree #320, creating CVG, determined the exact area of development entrusted to the corporation. By and large, that area included the Caroni District and parts of the Caroni River Basin. More recently, in 1974, Decree #67 gave CVG the legal control over the entire Caroni River Basin (20). an area of nearly 62,000 miles, thereby making it responsible

for the conservation and development of the total area and of the water resources, which are considered of utmost importance for the maintenance of the Caroni Hydroelectric System.

Decree #929 of 1972 established the role of CVG in the development of Region #8 (21). Region #8 covers the combined area of the Delta Amacuro Federal Territory and the state of Bolivar (Figure 1). In view of the enlargement in its sphere of influence, CVG is now making a series of additional studies and projects for various places in the entire region.

Through Decree #1331 of 1975, the number of regions of Venezuela was increased from eight areas into nine; Region #8, however, remains the same.

Objectives

The Corporacion Venezolana de Guayana was founded through Presidential Decree as an autonomous institute responsible to the President's office. Under that decree, CVG was assigned the following tasks (22):

1. to study the resources of Guayana within the development area as well as outside that area when so required in view of the nature of such resources.
2. to study, develop, and organize the exploitation of the Caroni River hydroelectric potential.
3. to program the integrated development of the region within the scope of, and in accordance with, the provisions of the National Development Plan.

4. to promote the industrial development of the region , both through the public and private sectors.

5. to coordinate the economic and social activities of the various government agencies within the region.

6. to contribute to the organization, programming, development, and operation of the public facilities necessary for the advancement of the area.

7. to carry out, by resolution of the National Executive, any other tasks including those operations outside the area whenever they are closely related with activities within the region.

The general objectives are taken and transformed into more specific tasks by different divisions of CVG. Each division plans its own strategies to obtain its objectives.

Organization

Although CVG is an autonomous entity, all assets are provided by the government, and it maintains a close relationship with the President of the Republic through the Presidential Commissioner for Development of Guayana. The top level within the structure of CVG is formed by the Board of Directors (see Figure 9). This Board is made up of the Commissioner who presides over it and five additional members who are designated by the President.

The schematic organization of CVG on the following page was approved by Director's Resolution #4085 in January 1978. This resolution includes the creation of the new division, Real Estate. The diagram shows eleven division, with the Secretary to the Presidency considered as another division. All the division, regardless of their rank, are directly responsible to the President, while the subsidiary and mixed enterprises are responsible to the Board of Directors.

Division: Objectives and Strategies

Corporacion Venezolana de Guayana has as its major objectives to study, coordinate, plan, and promote the integral development of the zone under its control and of the other regions bordering it. It is obvious that such a large task cannot be achieved by a single action or office, but it requires the coordinated action of an organized institution. So CVG is divided into eleven divisions, each with its own objectives and plan of action to arrive at the overall objectives of CVG. In other words, it is through each division that CVG sets its strategies in order to attain its objectives.

Secretary to the Presidency: While no division has power or control over any of the others (all divisions reporting to the Presidency), the division of Secretary to the Presidency can be considered as the closest to the Presidency. Its specific objectives are the following:

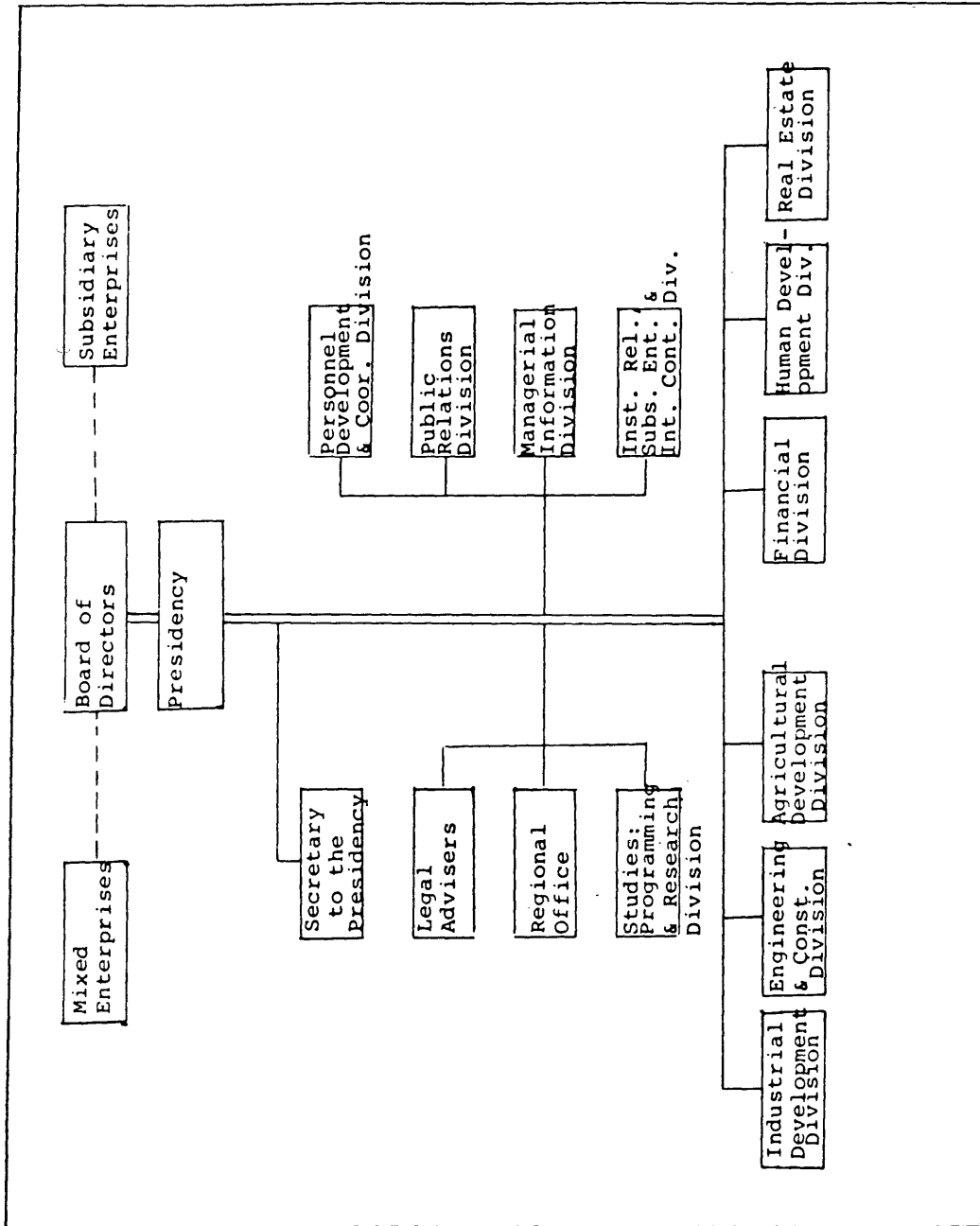


Figure 9. Schematic Organization of CVG, 1978

Source: Public Relations Division.

1. to serve as the link between the President and the different office heads of the organization, as well as the directors of public and private institutions.

2. to coordinate the activities of the units dependent on this division: Geomorphology and Cartography; Analytical Chemistry; Geological Mining Planning; and Geology of Mines and Geotechnology.

3. to assist the President in administrative and technical aspects and to transmit and coordinate all instructions emanating from the Presidency.

In summary, the Secretary Division has as its major goal the efficient enactment of Presidential directives. Moreover, the various units under the control of this division supply information of great influence on CVG's goals. The division strategies used to reach its specific objectives are:

1. the formulation of short and long-term plans related to geology and the development of mines in Guayana, as well as the administration of research programs, evaluative studies, and developmental programs for all the mineral resources. This strategy is important to CVG because most of its activities are related to mineral resources.

This division has been successful in the strategy as shown by the following accomplishments.

a) New iron deposits of considerable importance to the iron and steel industry of the region have been discovered.

b) An immense bauxite deposit of crucial importance to the developing of an integrated aluminum industry has been located.

c) The exploration and location of other necessary natural resources for the development of the aluminum industry, the iron and steel industry, agriculture, construction, etc. Kaolin, quartz, limestone, and dolomite are some of the minerals that have been found.

d) The formation and maintenance of permanent regional studies in search of other natural or mineral resources that could be incorporated in the development of Guayana.

2. Another strategy in use is the provision of geological information to any division or unit of CVG that may require it. This information is of particular interest to the Industrial Development Division for use in the promotion and creation of new mining companies in Guayana, and also to the Regional Office and the Studies, Programming, and Research Divisions in the writing of the National Development Plan in Geology and Mines.

It is difficult to calculate the effectiveness of this division because of the nature of the administrative tasks

assigned to it.* However, this division has been shown as effective through its geological studies subdivision which has achieved most of the goals of this division related to the geological and mining aspects.

Studies, Programming, and Research Division. This division operates, along with others, as a consultant unit. Its main objectives are:

1) to plan for the integral economic development of the region through the compilation and the evaluation of information concerning resources and necessities including systematic revisions and periodic adjustments to the investment program.

This objective in itself embodies the central objective of CVG. A lot of effort, time, and money has been dedicated to achieving this goal, but CVG is still far from accomplishing this objective. When it first began activities, CVG had little or no statistical data concerning natural and human resources on which to base its initial development plan for the region. CVG had to start collecting the important data. Presently, it is possible to obtain from CVG such data as regional product, regional income, transport, commerce, population, consumption, employment, unemployment, financial institutions, housing inflation, and mineral resources.

* A schematic description of the organization of CVG, and of each of its divisions is shown in Appendix B.

The availability of all this information makes possible the formulation of more rational and technical development plans for the region.

2) to research the general resources (mineral, natural, and human) of the zone and other outside resources when they are necessary for the Guayana Program.

The search for mineral resources necessary for the development of diversified industries has been fairly well organized and executed. The search for human resources based on the scarcity of labor at all levels, however, has not been quite as successful. This division has had to resort to importing labor from other countries, a practice that has met with some success.

3) to maintain a flow of continuous and reliable information into this division in order to evaluate and adjust the various programs of Guayana.

The following are strategies developed by the various units of this division to meet the listed objectives:

a) to prepare studies of the effects of the economic variables on the development program, as well as studies concerning the investments made by public and private institutions.

Most of the actions involved in this strategy have been related to the development of econometric models to evaluate

the effects of the large number of variables involved in development programs. Input-output models attempt to estimate direct and indirect requirements of industries responding to rising demand for their products. The last work of this kind was the Industrial Development Program for 1975-1980.

b) to direct and coordinate the activities of the different units of this division in relation to the economic aspects of the other divisions, with special emphasis on the activities of the subsidiary and mixed enterprises.

Because of the complexity and continual expansion of CVG economic undertaking, the division established a large number of strategies to fulfill its goals. Strategies vary according to the current situation. One has been to divide this division into three subdivisions in order to improve coordination. These subdivisions are:

1) Analysis and Control of Programs, an agency whose work is related to the formulation of supply and demand models and coordination of industrial programs.

2) Researching, whose main concerns are sampling and analysis of data, and maintaining a data bank.

3) Sub-regional division, which is concerned with statistical studies generated in the area. This sub-division also carries out census and surveys in the region. The division office, as well as the first two sub-divisions, are located in Caracas.

The information that comes from the subsidiary and mixed enterprises serves as a basis for the formulation of short and long-term goals of industrial development by the division.

Because of its functions, the Studies, Programming, and Research Division can be considered the heart of CVG's organization. Through this, CVG performs the work of a regional development corporation: to organize, plan, research, coordinate, and supervise the integral development of a particular region. Since its initiation, this division has made all necessary studies that serve as a springboard for the decisions of the Presidency. This division has had some success in forecasting requirements and problems of the different projects to be undertaken. However, CVG has been unable to meet all requirements or solve all problems, especially those related to housing and transportation.

Personnel Development and Coordination Division. This division is a consultant unit with the following main objectives:

1) to plan, organize, control and execute all the activities related to the administration of personnel.

2) to recommend the establishment of internal policies and forms necessary to carry out all the operations assigned to CVG in accordance with standing laws and regulations.

The efficiency of the whole organization depends on the fulfillment of the important objectives above. To meet these objectives, the division has developed a series of strategies that cover a variety of areas such as: a) the development of training programs for white and blue-collar workers according to the needs of the different units of CVG; b) the execution of social and health benefit plans for CVG personnel and the supervision of executing those plans; c) the development of labor policies in such a way that CVG's policies are in line with those of the different subsidiary and mixed companies; and d) the administration of efficiency evaluation programs for use in training, promotion, and recognition of personnel.

Is this division an effective one? Using some figures and facts from the 1975 Annual Report of CVG, it is possible to have some idea of this division's effectiveness. These figures show that during 1975, 150 employees or about 20 percent of the total, attended training programs, seminars, congresses, etc., at a cost to the corporation of almost \$25,000. During the same period, out of a total of 1,557 applicants, 236 employees were hired to fill 383 open positions, meaning that only 62 percent of the job vacancies were filled. In its search for new employees, this division made contacts with the Central Personnel Office, personnel associations, and universities and research centers.

The fact that this division does not fill all the positions that are available indicates two things: 1) that there are high standards and tough requirements for CVG employees, and 2) that the tough selection methods may hurt the organization in carrying out its responsibilities by limiting personnel too greatly.

Public Relations Division. This division is a consulting unit that has the following objectives:

1. to advise the President of CVG as to the plans, objectives, and diverse policies of the company.

2. to maintain control over all activities that divulge publicly the plans and achievements of CVG, as well as activities that encourage good relations with the community and different institutions in the Guayana Region.

This division has developed a group of strategies for achievement of these objectives through the use of the press, publicity, publications, cinema, expositions, conferences, and audiovisual presentations, library services, etc. The main strategies used by this division have been:

- a) the definition and evaluation of all news and public relations activities of CVG;

- b) the informing of the public and news media about the activities, plans, goals and diverse policies of CVG towards the economy, commerce, development, and social aspects of the Guayana Region.

c) the establishment and maintenance of relations with other public and private institutions and other sectors of the community to promote the projects of CVG.

This division can be considered very effective if public opinion is used as a measurement. A high percent of the population consider that CVG is the best administered government agency (23).

Managerial Information Division. The main objective of this division is to undertake the necessary studies for improving and maintaining administrative effectiveness and managerial operations of CVG.

The three major strategies used by this division are:

a) the development of the Managerial Informational Systems Department in order to oversee administrative effectiveness and managerial control. Its main responsibilities are financial control and evaluation of projects,

b) the controlling and updating of the managerial information systems which is done through the Department of Data Processing that handles all administrative information,

c) the acting upon the findings of systematic studies in order to establish relations between CVG and its subsidiary and mixed enterprises. Through this strategy the division evaluates the managerial system of each of the companies in CVG to make them more efficient.

To evaluate this division is to evaluate the administrative style of CVG, and to do so is impossible without being within this organization to have a close hand view of the many factors involved.

Institutional Relations, Subsidiary Enterprises, and Internal Control Division. This division has the following objectives:

1) to evaluate the adequacy and efficiency of the internal accounting and of the financial and administrative controls of CVG and CVG-EDELCA, and to verify their income statements. The results from other divisions are analyzed with the basic principles of managerial financing.

2) to analyze and summarize the income statement and reports of the subsidiary and mixed enterprises in order to inform the President and the Board of Directors. Again the results or statements are analyzed using basic principles of managerial financing. To complement the reports received from these companies, this division developed its own strategies, such as a) keeping permanent contact with divisions and enterprises that provide financial information to clarify information and to avoid wasting time through duplication of efforts; b) to prepare a monthly summary of the financial reports submitted by the subsidiary and mixed enterprises to maintain a permanent financial control over them; c) to keep a permanent

file on each company; and d) to schedule the monthly activities of each enterprise to control their work schedule.

This division seems to be a very efficient one based on the information contained in the annual reports. These annual statements contain balance sheets, income statements, as well as comments on the operations of the different subsidiary and mixed enterprises. At the present, this division controls SIDOR, EDELCA, Ferrominera, ALCASA, and Cementos Guayana. With the incorporation of projects already in development, the responsibilities of this division will continue to increase.

Industrial Development Division. This division was created on August 22, 1975 to take over some new responsibilities of the rapidly expanding CVG. It has as its main objectives to promote, execute, and coordinate the development of new companies in the public and private sectors.

Through the work of this division, the Guayana Region and the entire country may reach its desired goal of economic diversification. This division applies various strategies that can be divided into two major groups:

- 1) Strategies to determine which projects will be undertaken. These strategies include: a) negotiations concerning the industrial projects to be built; b) identification of infrastructure needs, services, and industrial localization of

specific projects; c) establishment and maintenance of the necessary contacts to insure positive outcomes of different projects; d) planning for the formation of companies, including governmental authorization and the consent of the people who will participate in the projects; and e) the realization of the preliminary stages of industrial projects and the preparation of basic documentation for the execution of the projects.

2) Followup strategies after different projects have been accepted: a) conducting a market analysis concentrating on the demand for the different projects in order to determine their plant capacity and conducting price analyses of the different products on national and international levels; b) determining engineering requirements by analysis of processes, machinery capacity, etc; and c) anticipating accounting and financial matters which include costs, investment, capital, budget, etc.

It is too early to evaluate the effectiveness of this division since its first decisions concern the Industrial Development Program of 1975-1980. The projects included in this program are Venalum, Interalumina, Fanactro, a foundry, a metalmechanic complex, and an electrode company. Of these projects, Venalum, Interalumina, and Fanactro are the most important because of the amount of investment and the multiplier effect. The other projects mentioned are important in forming an integrated iron and steel industry.

If the structure of CVG remains the same, the importance of the Industrial Development Division will increase as the Guayana Region attempts to diversify its industries. The decision for choosing the right industries in the future will be based on highly elaborate analyses in order to preserve harmony and balanced growth in the region.

Regional and Urban Engineering Development Division.

This division has as main objectives:

- 1) the promotion, coordination, and execution of engineering works in highly populated areas, especially in Ciudad Guayana.

Since the beginning of CVG when this division was created, CVG has put a lot of money and effort into this objective to provide the necessary facilities for people that have come to this region looking for better job opportunities. These facilities include housing, schools, hospitals, and recreational centers.

Until the late 1960's this division had success to a large extent in meeting the facility needs of the region; but since 1970 and especially since the formulation of the Industrial Development Program for 1975-1980, the gap between the demand for schools, houses, hospitals, etc. and the supply of these services is growing. It seems impossible with the

actual growth rate of the region to decrease the gap to any extent. Therefore, the already existent problems are intensified.

An example of the failure of the division to meet this objective is represented by the following: In 1963 CVG and the Steelworkers Union entered into a contract that included a commitment on the part of CVG to provide adequate housing. CVG developed a program (published in June, 1964) for the construction of 4,180 housing units suitable for families of low income by February, 1966. But by the end of 1966, fewer than 1,100 units, or roughly 25 percent, had been completed. Most recently in 1975, the division spent almost \$55 million in 107 different construction contracts to build and improve housing, schools, health centers, urban developments, and recreation centers (24).

2) The formulation of recommendations about all policies, objectives, and plans necessary for the physical-spacial sector of the Guayana Region.

The strategies for the achievement of this objective change each time a new plan is formulated. The most recent strategies attempted to determine the necessities for the region as a consequence of the Industrial Development Program of 1975-1980. One of the problems of this division relates to the fact that the development rate of the Guayana Region accelerated tremendously after the oil revenues increased in

1973, therefore, it was an anticipated increase in the role of expanding, which required a whole new approach, and at the moment, this division or the whole organization has not been able to adjust to this rate of change. The present growth rate of Ciudad Guayana is expected to reach an extreme limit by 1980; so most efforts of this division are concentrated on developing the necessary strategies to face that situation. These studies are concentrated on mass transportation systems, services, recreation, etc.

In evaluating the performance of this division, it must be said that the division has not been able to fulfill its objectives, not because it is not able to do so, but because the quantity and variety of facilities involved is too great. Also in many cases CVG is duplicating the tasks of some other government agency, which translates into a waste of time and effort. The main problem is that CVG's industrial planning and growth is outstripping the development of progress that provides necessary infrastructure. The harmony and total development of the region is upset and imbalanced.

Agricultural Development Division. The main targets of this division are:

- 1) the agricultural responsibilities within Region #8 through planning, administration, and evaluation of agricultural projects, and the conservation and handling of natural renewable resources;

2) the study of the best alternatives for the promotion and creation of agro-industrial enterprises for exploiting the vast forest reserves of the region.

To achieve its first objective, this division participates with the Venezuelan Ministry of Agriculture and the Food and Agriculture Organization of the United Nations (FAO-UN) to formulate different strategies. These strategies have led to the study of the potential agricultural productivity of the region and to the formation of assistance programs to farmers in the region.

The poor quality of the soils in the Guayana Region has been well documented. For this reason, most of the activities of the division are dedicated to developing educational and assistance programs as a means of increasing the land productivity of land already in production. Also, it has developed an experimental project of raising buffalo to provide a substitute for the growing imports of beef for Venezuela (25).

Some other strategies of the division are: a) the permanent evaluation of the agriculture program to determine its requirements and to promote agro-industrial enterprises; b) the coordination of actions with public and private organizations in developing different agricultural programs; and the coordination of engineering activities with the Regional

and Urban Development Division concerning design requirements and execution of projects in drainage and roads.

The creation of agro-industrial enterprises is of slight importance to CVG due to the reduced importance of agriculture in the region. However, CVG has since its foundation wanted to establish a pulp and paper plant in the region. With this goal in mind, a plantation of Carribbean Pines was started in the late 1960's.

Concerning the effectiveness of this division, the situation is very similar to that of the Regional and Urban Engineering Development Division: a large undertaking involving much energy, time, and money, duplication of responsibilities by agencies, etc. However, this division has created some programs that have left positive assets such as the plantation, the introduction of new techniques, and the development of educational and training programs.

Financial Division. This division's objectives are:

1) to develop and recommend short-term plans and politics for the use of CVG funds in accordance with long-term plans and goals.

The success of this division in meeting the above objective insures the necessary funds for each of the programs carried out by CVG. The funding is obtained through negotiation of this division with the government, banks, and other financial institutions.

This division's success can be measured by the fact that there have always been sufficient funds to finance all CVG's projects. As an example, the Industrial Development Program for 1975-1980 has insured its financing through the contribution of the Venezuelan government and some foreign banks, especially the World Bank and the Export-Import Bank.

2) to facilitate the administrative and financial services necessary for the execution of the programs and operation activities of CVG.

In order to reduce red tape in administrative affairs, CVG, by decision of the Venezuelan government and the Venezuela Funds Investment Corp., was made the official agency in charge of processing all requests for financing of all the industrial projects in the Guayana Region.

Besides the processing of requests, this division is responsible for the preparation and control of the annual CVG budget that permits funds for short-term projects, and for the determination of financial investment needs of the subsidiary and mixed enterprises. The success of CVG depends on the well-being of the mixed and subsidiary enterprises; thus, the last strategy mentioned is of great importance.

Most of the funding for CVG's projects is derived from the central government that in turn derives its revenue from oil. This division should locate other sources of funding

such as foreign investment or investment by companies within CVG so that oil revenues begin to take on less importance.

Human Development Division. Following its philosophy of integral development, CVG created this division to promote the preparation of human resources necessary for the industrial, urban, and rural development of the area at all levels. Vast numbers of workers are needed for the various industries. Above all, there is a great demand for skilled workers. The strategies of the division are based around supplying and training skilled workers to meet the demand. Some of those strategies are:

- 1) to develop training programs jointly with the companies of the area, the Ministry of Labor, and the National Institute of Cooperative Education (INCE) to alleviate the skilled labor shortage.

Of course, these training programs are a step in the right direction; but one unforeseen problem is that after workers have gone through the training program, many have looked for jobs with other companies in other regions causing a high turnover in employees. This situation will probably worsen as the labor force increases to an estimated 56,700 employees, and the steel industry in the state of Zulia begins to function. A high regional competition for skilled workers will probably ensue. CVG and all the companies of the region

must improve workers conditions and create additional incentives to hold their workers.

At the present, the turnover is the most serious problem faced by the companies of the region, and it seems that the situation will become worse due to the failure of CVG and other regional organizations in providing the necessary infrastructure such as adequate housing, recreational areas, transportation systems, etc., to the fast growing population of the Guayana Region. These facilities could constitute an additional incentive for the workers to stay longer at their companies. Besides the lack of the necessary infrastructure, the workers and all the people of the region have to face the general high level of inflation that affects the whole country, but that is worse in the region because of the industrial development boom of the area.

2) to promote human resources for the agricultural sector. This strategy involves the educating of farmers of the region in modern farming techniques and the supporting of activities developed by the Agricultural Development Division. CVG, the Ministry of Education, the Ministry of Agriculture, and INCE have decided to emphasize this program by intensifying educational opportunities and building agricultural schools.

3) to improve educational resources and promote cultural and scientific development. At the present, the region has enough facilities for education at the primary and secondary

levels. But by 1980, the number of school-age children in the region will have greatly increased (see Table 2 for those requirements).

Table 2

Educational Facilities and Student Population

<u>Level</u>	1976-1977		1979-1980	
	<u>Buildings Available</u>	<u>Students</u>	<u>Buildings Needed</u>	<u>Projected No. Students</u>
Preschool	33	4,620	104	14,560
Primary	15	15,000	42	42,000
Secondary	<u>9</u>	<u>12,900</u>	<u>19</u>	<u>23,000</u>
Total	57	32,520	165	83,860

Source: CVG, 1977, Annual Report, p. 97.

The region has always lacked technical schools, colleges, and universities. It was only recently that the Instituto Politecnico de Guayana was created in response to the necessity of industrial development and the need for skilled people. This institute cannot supply enough technicians, however. CVG has not considered recommending the creation of any superior academic institute, and it was not until 1975 that CVG started using Venezuelan universities for carrying out its extensive research programs.

4) to improve and create additional recreation and health centers. Visitors to Ciudad Guayana can observe the

lack of convenient recreational areas and parks within the city. If CVG wishes to retain and attract new workers to the area, many parks will have to be built and planned for.

Although this division has been partially successful in some of its objectives, special attention should be given to developing technical and superior educational facilities and to intensifying contacts with national universities. It is this division rather than the Ministry of Education that is responsible for these institutions in the Guayana Region.

Real Estate Division. This division was recently established in January of 1978. Its major function is to administer and control all the properties owned by CVG. Formerly, this activity was carried out by the Regional and Urban Engineering Development Division.

SUBSIDIARY AND MIXED ENTERPRISES

The different divisions into which CVG is divided make it possible for this institution to develop a variety of strategies necessary for attaining its goals. However, an important part of those strategies are carried out by companies included in the organizational structure of CVG. These companies are the subsidiary and mixed enterprises. Table 3 shows the different companies and CVG's participation in them.

Subsidiary Enterprises

The subsidiary enterprises, which are entirely government owned, are in charge of all activities in Guayana that the government considers of national interest. The three subsidiary enterprises are: Electrification for the Caroni River (EDELCA), CVG-Ferrominera deal Orinoco (Ferrominera), and the iron and steel mill industry (SIDOR).

Siderurugica del Orinoco, C.A. (SIDOR)

SIDOR is an integrated industrial complex which processes iron ore in order to produce the steel products used

Table 3

CVG Group

	Contribution to Capital Stock (\$000,000)	% of Capital Stock	Amount to be paid	Paid Capital Stock (\$000,000)
<u>Subsidiary Enterprises</u>				
CVG-Siderurgica del Orinoco, C.A., SIDOR	2,174.420	100	-	2,174.42
CVG-Ferrominera Orinoco, C.A., FERROMINERA	174.420	100	-	174.420
CVG-Electrificacion del Caroni, C.A., EDELCA	297.250	100	-	297.250
TOTAL	2,646.100			2,646.10
<u>Mixed Enterprises</u>				
Aluminio del Caroni, S.A., ALCASA	11.744	50	-	11.744
Industria Venezolana de Aluminio, C.A., VENALUM	102.400	80	-	102.400
Minerales Ordaz, C.A., MINORCA	2.669	51	-	2.668
Fior de Venezuela, S.A., FIOR	6.200	33	-	6.200
Ferroaleaciones Venezolanas, VENBOZEL	1.581	20	-	1.581
Venezolana de Ferroaleaciones, BOZEL, C.A.	2.326	25	-	2.326
METALMEG, S.A.	1.395	48	-	1.395
FANACTRO	12.000	50	-	12.000
Cemento Guayana, C.A.	.698	25	-	.698
C.A. Pulpa y Papel	.093	40	-	.093
Puerto de Hierro	.052	50	-	.052
Sociedad Financiera Atlantida	.349	15	-	.349
Total	141,560.000			141.460
TOTALS	2,787.560			2,787.650

Source: CVG, 1977, Annual Report 1975, Caracas, p. 76.

in a variety of economic activities. As an integrated plant, the main sections of SIDOR are: storing and transporting of raw materials and products, preparation of raw materials and production of pig iron, production of steel, and rolling and tube fabrication.

The main raw material input into SIDOR is iron ore, produced at the different deposits of the region that are located about 75 miles from the plant; coke, imported from the United States, Europe, and Japan; and scrap iron from the United States.

Currently, SIDOR is in the process of executing an expansion plan whose main goal is to increase the production of steel products from the present level of 1.2 million metric tons to 4.8 million metric tons by 1980. The total investment of this expansion program will be \$3.5 billion, and it will generate 8,000 new jobs in addition to the present 12,000 labor force. Due to the expansion program, the capital stock of SIDOR has been increased from \$383.2 million to \$2,174.4 million.

The completion of the expansion plan will make possible:

- 1) the satisfaction of the growing domestic demand for steel production. There has been shortage in supply since 1975.
- 2) the diversification of the export market.
- 3) the better usage of Venezuela's natural resources, particularly iron ore, which at present is mostly exported in its natural form.

The idea of SIDOR, the Orinoco steel plant, was conceived because the steel industry is viewed as one of the basic elements for development of a region or a country. The success of the SIDOR project can be measured by the employment it offers to 12,000 workers and the steel products it supplies to the national economy, (with a small amount of exports). With the completion of the expansion plan of this company, it will be an important source of foreign exchange in international economy because Venezuela will be able to trade with some other countries and thus provide an alternative to oil as the major export of the country. Furthermore, it will be a base for manufacturing industries and manufactured products to sell world-wide.

Even when SIDOR has made profits within its operating years, they have been small considering the high capital investment of the plant. There has also been a high turnover of labor, affecting the profit margin due to low salaries and the scarcity of housing in the area. To meet these problems SIDOR has adopted a policy of higher wages and is cooperating with CVG and other regional institutes to provide not only houses, but all facilities for its employees. Increased wages and housing are serious problems for the executives of SIDOR and CVG, when one considers the plan for doubling of the work force by 1980 and the competition that will come from the steel mill to be built in the state of Zulia.

In Appendix A, Table 4 to 6 contain some data concerning the activities of this company.

Electrification del Caroni, C.A. (EDELCA)

EDELCA is an hydroelectric power company that was formed in August 1963 to operate, administrate, and develop the hydroelectric system of the Caroni River.

The electricity generated by EDELCA supplies a high percent of the many projects installed in the Guayana Region as well as projects in other regions. The actual hydroelectric power generated by EDELCA represents almost 50 percent of the total national generation of electricity (26).

This subsidiary has a capital stock of \$297,25 million and about 1,100 employees.

EDELCA was the first enterprise controlled and administered by CVG. Recently, in 1974, it became an autonomous company. In its years of existence, EDELCA has been very productive and has foreseen and kept up with the electrical needs of the industries that are and will be installed in the region.

This productivity is measured in the ability of this company to fulfill the demand of the different industries of the region and some other regions. The following table shows some data for 1974 and 1975.

Table 4

CVG-EDELCA: Generation and Consumption

of Electric Power
(million kilowatts/hour)

	<u>1974</u>	<u>1975</u>
Gross Generation	7,248.78	8,402.63
EDELCA's internal plants Consumption and waste due to transmission	<u>520.35</u>	<u>509.37</u>
Net generation	<u>6,764.43</u>	<u>7,893.26</u>
SIDOR	1,633.32	1,646.79
ALCASA	881.27	961.08
Cadafe* Regional	161.60	198.95
Cadafe Inter-regions	3,159.13	3,612.84
Electricidad de Caracas**	731.04	1,265.71
Regional Industrial Con- sumption	164.10	191.80
Guri's Construction	13.97	16.09

* Government-owned electrical company

** Private-owned electrical company, operating only in Caracas.

Source: CVG-EDELCA, 1976, Annual Report 1975, Public Relations
Division, Caracas, p. 33.

At the present, this company is developing the final phase of the Guri Dam which will be able to generate 10 million Kilowatts.

Although this company has been technically efficient, its financial statements do not reflect this fact. For instance, in 1975, the net profit of the company was less than \$10 million over a total equity of over \$275 million. The executives of this company blame the low profits on the cheap selling price of electricity. However, this low profitability is compensated through an overall socio-economic benefit represented by the electric power supplied to the industrial development process of the Guayana Region and the whole country.

Ferrominera del Orinoco, C.A. (FERROMINERA)

By decree #580 of 1974 . . . "The Venezuelan government has taken over, for reasons of national interest, the^{2.7} exploitation of iron ore. As a consequence, beginning on December 31, 1974, all the concessions granted by the government for the exploitation of this mineral are cancelled." (28).

On January 1, 1975, CVG began to carry out the activities related to the iron industry and on December of the same year, created FERROMINERA with a capital of \$120 million and an installed production capacity of 28 million metric tons per year. The fundamental objective of this company is the

exploitation of iron ore including its extraction, trading, transportation, research, etc.

FERROMINERA is still in the process of taking over the operations of the Orinoco Mining Company and the Iron Mines Company of Venezuela, which were the foreign companies involved in iron ore exploitation. FERROMINERA employs over 3,700 people.

FERROMINERA has a great challenge to meet because the previous exploiters of the iron ore deposits set a precedence of high efficiency and the iron ore extracted contributed a great deal to the region and the country as a whole.

The exploitation of iron ore began in 1953, much before the creation of CVG, and after a few years in business, the companies made Venezuela's name known in the iron world market. Output increased from 5.8 million metric tons in 1954 to 24.8 million metric tons in 1975 (29). At the same time, the iron ore industry became, and still is, the second source, after oil, of exports and revenues. In 1974, the contribution of the iron industry to the total value of exports, and income from foreign exchange was 2 percent and 1.4 percent, respectively. In addition, the companies dedicated to the exploitation of iron ore helped to develop Ciudad Guayana through the construction of houses, hospitals, schools, and all the infrastructure necessary for a new city. More detailed information

concerning the data used in this section is shown in Appendix A, Tables 7 to 10.

Conclusions

The subsidiary enterprises, especially SIDOR and EDELCA, have achieved many of their technical goals; but because of their fast development, they have created a series of urban problems which CVG in its responsibility for the integral development of the region has been unable to solve. Most of the problems are related to the lack of housing and other facilities for the workers and their families. Also, it is necessary for these companies to become less dependent on government control to bring in profits. This is especially true for SIDOR and EDELCA; FERROMINERA has had to be more independent through its participation in the iron ore world market.

Mixed Enterprises

The mixed enterprises play an important part in the strategies of CVG for Guayana's development. CVG promotes and facilitates economic programs for private firms which are important to the overall economic development of the region; and in turn, CVG obliges all private firms to cooperate with the corporation when it considers a company necessary for promoting regional growth.

Even when most of the investment involved in many of the mixed enterprises do not reach the vast amounts of the subsidiary enterprises or even some of the mixed enterprises such as VENALUM or ALCASA, they represent the means through which CVG can diversify the regional economy. These mixed enterprises provide some of the resources needed by the major industrial complexes, steel and aluminum, or they process some of the finished or semi-finished products of the steel and aluminum complexes.

The participation of the government in mixed enterprises ranges from 15 percent to 80 percent of the capital stock. This participation depends on the nature of the firm's activities. There is a wide variety in the products of the different mixed enterprises: aluminum, cement, pulp and paper, parts for the iron industry, ferro-alloys, etc.

Through the promotion of mixed enterprises, CVG has been able not only to begin diversifying the economic base of the region, but also it has attracted a variety of technology into the region. The aluminum industry constitutes a good example of this situation. It uses technology from the United States in the Alcosa plants, from Japan in the Venalum plant, and Sweden know-how will be used in the bauxite plant.

Aluminio del Caroni, S.A. (ALCASA)

The aluminum industry, as stated previously, is basic to the Guayana Development Program, and ALCASA is one of the aluminum producing companies in this area. It was formed by CVG and Reynolds International, each with a 50 percent participation in a total investment of close to \$25 million.

The plant started production in 1967 with an initial capacity of 10,000 metric tons of aluminum ingots. In a later expansion in 1969, ALCASA doubled that capacity, reaching an output of 22,500 metric tons. Production rose to 50,000 tons in 1973. At the present, the production is around 60,000 metric tons, and the company employs 1,600 workers. A current expansion plan will bring production to 120,000 metric tons by 1978, requiring an investment of nearly \$160 million (30).

In addition to aluminum ingots, ALCASA produces cold and hot rolled steel products, tin foil, as well as other semi-finished products.

Venalum

The Venezuelan Industry of Aluminum, VENALUM, was established in 1973 through the participation of CVG with 20 percent investment and some Japanese firms with an 80 percent investment. In mid-1974, there were some conversations held by CVG and the Japanese partners that eventually modified the terms of the original contract. In December, 1974, a new contract was signed that granted CVG 80 percent participation

and the Japanese firms, the remaining 20 percent. The Japanese firms involved are K.K. Kobe Steel Ltd., Marubeni Corporation, Mitsubishi Metal Corporation, and Sumitomo Chemical Corporation. This new contract also dealt with improvement in technical aspects and engineering services. These changes will make it possible to increase the capacity from the initial 200,000 metric tons to 320,000 metric tons, with the same initial amount of investment of \$128 million. Production will start in mid-1978 and the company will employ around 2,500 workers (31).

With the planned production of VENALUM along with the output of ALCASA, the domestic aluminum production will be raised to 400,000 metric tons per year by 1980, which will give Venezuela top rank in aluminum production in Latin America.

Starting with a production of 70,000 million tons per year, this plant will reach its final capacity, 320,000 metric tons per year, by 1980 with a planned total investment of \$560 million.

Interalumina

The production of ALCASA and VENALUM justifies the establishment in Guayana of a plant for the reduction of bauxite in order to exploit domestic deposits. So CVG and Swiss Aluminum Ltd (ALUSUISSE) of Zurich have signed a contract

to operate the company Interamericana de Alumina (INTER-ALUMINA) which will construct and operate a plant to exploit the bauxite deposit at Los Pijiguaos. When in operation, this plant will supply bauxite for a one-million metric ton per year alumina plant. Before the initiation of this joint venture, Interalumina used to be a CVG-owned company and had as a major task to supply alumina to the aluminum industry.

ALUSUISSE will carry out the complete feasibility study for the exploitation of Los Pijiguaos, including definition of the ore body, development of the mine, infrastructure including a township and transportation of the ore. Also, it will supply technical and management assistance and know-how. The plant is scheduled to start up production in 1981.

The total investment of this joint venture is \$558 million. CVG holds 85 percent and ALUSUISSE 15 percent of the total capital stock.

Venbozel

This plant started operation in February, 1977 in the production of ferrosilicon. Some plans have been developed for increasing the present installed capacity of 57,000 metric tons per year to 70,000 metric tons. All the production of this plant is exported, but in the near future, it will supply the needs of SIDOR when its expansion is completed.

The participation of CVG is 20 percent of \$1,581,000 of the total capital. VENBOZEL employs 205 people, and uses as raw materials the products of FERROMINERA and MINORCA (32).

Fior de Venezuela, S.A. (Fior)

This project consists of two stages. Stage I consists of a reduction plant of iron ore that concentrates the ore to 90 percent pure. This reduction is based on the "FIOR process," (fluidized iron ore reduction). It has a capacity of 400,000 metric tons per year and is already in production. Stage II consists of the same process, but in this case the production is planned to be increased by 1,500,000 metric tons per year, raising the capacity of the plant to 1,900,000 metric tons per year. This stage is planned to be finished by 1979.

CVG has a participation in this project of 33 percent.

Minerales Ordaz, C.A. (MINORCA)

Built by the Orinoco Mining Company, this briquet plant started production in 1970. Since the Venezuelan government took over the iron activities, CVG has had 51 percent interest and the U.S. Steel Corporation, 49 percent participation in this firm.

Each of the four sections of this plant realizes a basic operation of the process: a) preparation of the mineral, b) reduction, c) formation of briquets, and d) generation of

natural gas. In addition, the plant has a service area that includes a pumping, purification and treatment plant; an auxiliary steam generator, and a nitrogen-production plant.

The briquets are used mainly to supply the needs of SIDOR in the blast-furnace production of pig iron or in the direct reduction processes. With the use of briquets, it is possible to increase productivity and decrease the use of coke considerably.

The installed production capacity of MINORCA is one million tons per year with a use of 1,600,000 tons of iron ore. The plant generates employment of nearly 300 people (33).

Cementos Guayana

Founded in 1967, this cement plant started production in 1970. The main product of this plant is Clinker Cement produced from slag from the blast furnace of the iron and steel industry.

Cementos de Guayana with 25 percent CVG participation, was formed to supply the cement needs for the region; but as a consequence of the fast development of construction, the actual production of this plant is behind the demand for cement. Therefore, cement must be brought in from other regions and other countries. By 1978, the plant is expected to be producing 190,000 metric tons, its full capacity.

Metalmeg, S.A.

Beginning production in 1974, this company has been dedicated to the production of parts for the oil industry. It is now planning to install a fabricating facility in Ciudad Bolivar to make some parts for the fabrication of cars and trucks.

A recent expansion plan to increase production cost over \$1.1 million to build a new building of 3,000 square meters, to construct a forge plant, and to purchase two pile drivers (or drop hammers) of 3,000 and 10,000 pounds, respectively. CVG has 48 percent interest in the company's total capital of \$1,395,000

Fanactro

Not yet in operation, this plant being built in Ciudad Bolivar will manufacture trucks and diesel motors. Starting production in the second half of 1978, this plant will produce 6,000 trucks and 8,000 motors per year. According to some forecasts, this number will not only satisfy domestic demand, but also enable the export of a limited quantity to other countries in the Andean Pact.

The total investment of this project is around \$12 million, with 40 percent participation by CVG, 21 percent holdings by the foreign firm DEERELCO, and 30 percent holdings of domestic investors. DEERELCO is responsible for supplying technology and technical assistance. When normal production capacity is reached, the plant will be able to employ 800 persons.

All these subsidiary and mixed enterprises and other smaller-sized companies are located in an area known as Matanzas Industrial Complex, located 20 miles from Ciudad Guayana. Because of all this industrial growth, Ciudad Guayana is the most developed and most problem-ridden city in the region.

Conclusions

Even though CVG has had the power to create regional mixed enterprises, it did not promote any until the formulation of the Industrial Program for 1975-1980. Before this time, CVG only participated in ALCASA and in some other minor projects such as Cementos Guayana and Hotel Guayana.

The promotion or creation of mixed enterprises constitutes the only means by which CVG can really attain its goal of diversification. CVG should dedicate its efforts more to the promoting and financing of these than to participation in their equity. The mixed enterprises should be more independent and creative in their approach towards managerial and market aspects.

The Industrial Program of Guayana

CVG has formulated and already undertaken an exceptional industrial program for the period 1975-1980 because of both the huge amount of capital involved and the extensiveness of the programs. The total amount of investments

for all the industrial projects is \$7.6 billion, or 81.3 percent of the total investment.

Revenue for this program was made possible by the oil price increase of 1973 which caused prices to jump more than 300 percent. The inability of the country to absorb the increased revenue without generating hyperinflation, foresaw the need of a long-term plan for the economic development of Venezuela.

According to estimations of CVG, this program will generate 56,700 additional direct and indirect jobs in the region, and the population will increase by 256,800 persons over the number predicted for normal growth of the Guayana. The population of Ciudad Guayana will double reaching a total of 377,700 by 1980. A list of projects and their cost are listed in Table 5.

Table 5

Industrial Program of Guayana, 1975-1980

<u>Name of Project</u>	<u>Cost of Project (million dollars)</u>
SIDOR - PLAN IV	4,000
EDELCA	1,441
ALCASA	155
VENALUM	620
INTERALUMINA	463
ACELCAR	180
FLOR	120
ELECTRODES	120
VENBOZEL	27
FANATRACTO	203
METALURGICAL COMPLEX	96
	<u>7,434</u>

Source: Corporacion Venezolana de Guayama, 1976, Industrial and Infrastructure Program, 1975-1980, Internal Publication.

Financing

As mentioned before, the government will be undertaking over 80 percent of the total investment considered in the Industrial Program. A more complete explanation of the source of funds for this program can be seen in Table 6 below:

Table 6

Industrial Program of Guayana
1975-1980
Sources of Financing

<u>Source</u>	<u>Millions of Dollars</u>
Contribution of the Public Sector to Capital Stock	2,645.6
Contribution of the Private Sector to Capital Stock	167.7
Loan from the Public Sector	3,532.0
Loan from the Private Sector	38.8
Financed Interest During Construction of Projects	922.0
Reinvestment of Own Funds	<u>284.5</u>
Total Investment	7,590.7

Source: Corporacion Venezolana de Guayana, 1976, Industrial and Infrastructure Program 1975-1980, Caracas, Internal Publication.

CVG is the main financial organization of the region through the funds obtained from the government and loans from financial organizations. Another source of funds is the sale of shares in the stock market. The main financial backer is the Venezuelan Investment Fund (FIV) which signed a contract with CVG for funds for the different projects (34).

(34)

Table 7 which follows is a description of the financing by the public sector and the sale of stock in the open market to the Industrial Program.

Table 7

Industrial Program
of Guayana
1975-1980

Financing by the Public Sector and Shares

<u>Source</u>	<u>Million Dollars</u>
Funds for Industrial Investment-CVG Budget	229.5
Direct Contribution of the Venezuelan Investment Funds (FIV) to the Capital Stock of SIDOR and EDELCA	1,380.7
Loan from the FIV to CVG	3,735.6
Sale of Bonds in the Open Market	<u>831.6</u>
Total Financing-Public Sector	6,177.4

Source: Corporacion Venezolana de Guayana, 1976, Industrial and Infrastructure Program, 1975-1980, Caracas, Internal publication.

CVG'S RELATION WITH REGIONAL ORGANIZATIONS

Since its foundation, CVG has had its main offices located in Caracas, Venezuela's capital city, and has maintained a regional office in Ciudad Guayana (see Figure 3). Because most of CVG's important decisions are made in Caracas, but carried out in the Guayana Region, the effectiveness of those decisions is limited by the distance between the two areas.

When CVG first started its projects, SIDOR and EDELCA, the region did not have the necessary socio-economic conditions or industrial infrastructures, and at the same time, neither the national government nor the regional government had agencies to provide these needs as the Guayana Region at that time was a sparsely populated area of little importance to the Venezuelan economy. It was necessary for CVG to act as the regional director assuming all responsibilities that in many cases far exceeded those of the governors of the state of Bolivar and the Delta Amacuro Federal Territory, the land encompassed within the Guayana Region. This situation continues today. For example, the Governors are invited to the meetings of the Board of Directors of CVG to present

their views and suggestions, but they do not help in making any decisions concerning CVG's actions.

CVG conduct the necessary studies concerning housing, health, and recreation facilities, roads, etc., in coordination with the other different regional organizations: City Council for Coordination of Ciudad Guayana, the Government Housing Agency, and the regional agencies of the Ministry of Health, Public Works, Labor, and Education. CVG felt that the combined action was not enough to solve the problems; so CVG took over the responsibility of meeting all the region's needs, concentrating the problem-solving and management in a single institute so that CVG became investigator, planner, coordinator, and director.

Through the years, CVG has increased its relations with the different regional organizations; but at the same time, its responsibilities have multiplied as the logical expansion of its internal organization takes place. The tremendous growth of CVG's organization structure can be seen by comparing the diagram on page 84 of CVG 10 years ago with the diagram of CVG responsibilities today on page 39. Even though its relations with other regional organizations have improved and strengthened, CVG has not delegated any of its responsibilities or powers to these organizations. At present, CVG has a massive structure that resembles the central rather than regional government structures.

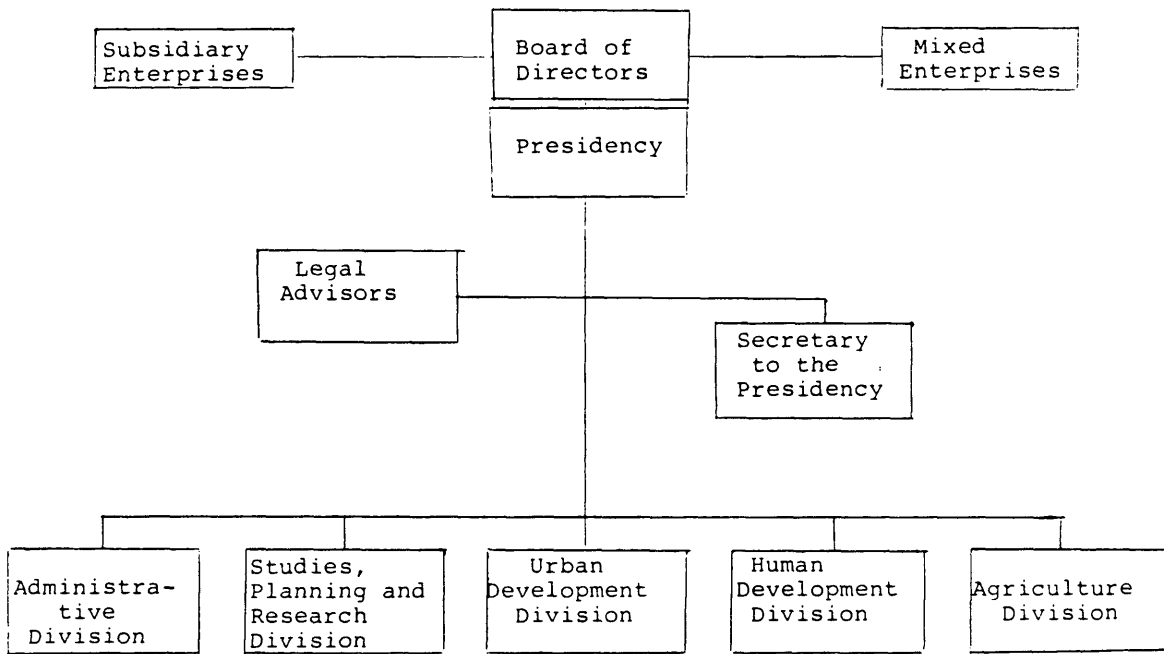


Figure 10. Schematic Organization of CVG in 1968.

Source: CVG, Annual Report, 1969.

Not a single publication or statement can be found in any of the literature concerning CVG's relations with other regional corporations. Thus, the reader is left to assume that these relations are of little matter or importance. The same thing can be said in relation to Venezuelan universities. It was only two or three years ago that CVG created slight ties with some universities.

In conclusion, it can be stated that CVG has developed an internal organization that surpasses the organizational structures of both the state of Bolivar and the Delta Amacuro Federal Territory. In many cases disputes have developed among the CVG and state officials because of this imbalance in power and responsibility. Also, because of the vast structure of CVG, it often duplicates the activities of other organizations. There is also duplication of work internally for the main offices in Caracas complete tasks that have already been done in Ciudad Guayana or vice versa. Moreover, CVG has done very little to share its experience with other regional organizations or with national universities. For many years, from 1961-1966, CVG counted on the advice and counsel of the Joint Center for Urban Studies of the Massachusetts Institute of Technology and Harvard University. CVG's reluctance to share information and experience can only be viewed as selfishness.

CONCLUSIONS AND RECOMMENDATIONS

The preceding analysis demonstrates the importance of the Guayana Program, and CVG, to the region and the country as a whole. In the early 1960's, although the Guayana Region occupied one-quarter of the land in Venezuela, it was of small importance to the national economy, and its population made up only four percent of the country's total population. Today, the area, with an 18-year old regional corporation contributes 10 percent of the gross national product, shows an industrial annual growth of over 12 percent, mainly concentrated in the iron and steel industry and the emerging aluminum industry, and maintains an average annual population growth of about 12 percent. Ciudad Guayana in 1961 had a population of 42,000 people; that has now increased to almost 225,000 people. All those events have happened while CVG has been in charge of coordinating the development of the region; so it can be concluded that in general, CVG has been an effective development corporation. However, in light of the findings of this thesis, the author feels the efficiency of CVG can be viewed in either of two ways.

1) that CVG has been a very successful means for achieving regional development.

2) that CVG has not succeeded in some important areas as a central development entity.

In support of statement 1) above, the efficient exploitation of mineral resources in the Guayana Region can be listed as evidence. Other proof is the fact that CVG has been able to establish an economic base in a region that was a completely depressed area 20 years ago, its only activities being the exploitation of some iron ore deposits by two foreign firms and some minor agricultural activities. The stable economic base of CVG rests on heavy industry: an iron ore mining company, an integrated steel mill plant, an electric power company, and some companies that use different processed products from the above companies.

The extra regional importance of Guayana's economic base can be attributed to the iron ore exports (over 90 percent of the ore mined), to the products provided by the steel plant for the national market, to the electric power supplying almost 50 percent of the electricity used in Venezuela, and to the employment generated by the subsidiary and mixed enterprises of over 20,000 positions. Also the corporation is helping attain the regional and national goal of economic diversification through the iron and steel industry and the

integrated aluminum industry. Additional diversification in the region is planned through the development of a heavy industry complex that will include the exploitation and processing of bauxite, alumina, pulp and paper, and metal products.

In support of statement 2), the author feels that CVG has not been effective in bringing about a harmonious development within the region; industrial growth has far outreached the growth of the socio-economic-urban infrastructure. As a consequence, Ciudad Guayana as a main center of development is plagued by a lack of housing, health centers, parks and recreational facilities and adequate business areas. Thus, instability in the work force, a high turnover of employees, is caused by the deficient infrastructure of the area.

Because of the magnitude of this problem and the continuous industrial expansion, CVG and other regional organizations have been unable to find a satisfactory solution. A question that comes to mind upon considering this situation is if it is worthwhile or even sensible to plan for future industrial programs when the infrastructure will not be able to support the expected growth.

Another negative feature in CVG's complete control over all activities in the installation and management of a new enterprise is that all the main ideas and decisions for subsidiary companies issue from a very limited group of

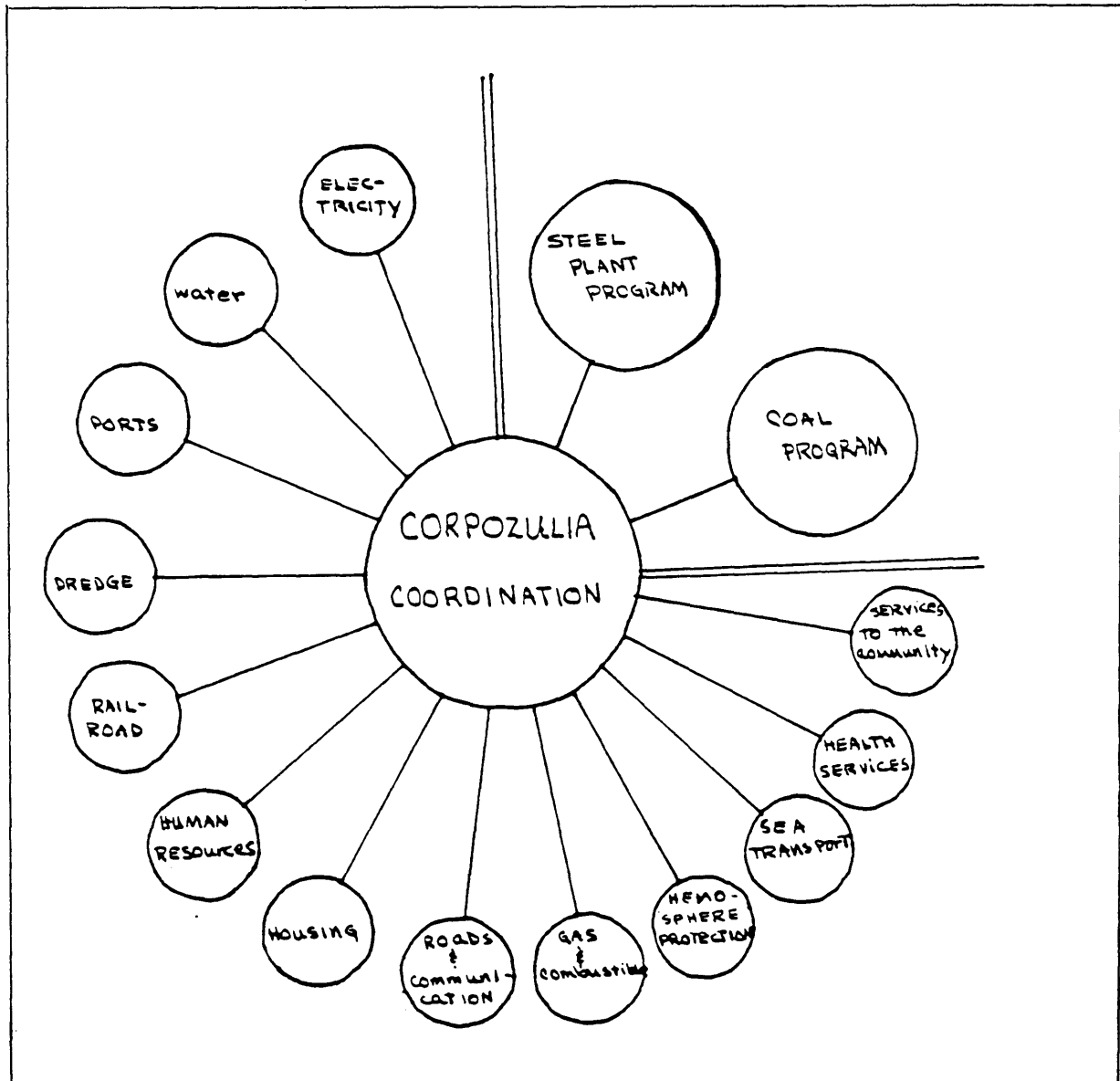
people. This tends to curb originality in management and competitiveness in the system.

Recommendations

1) CVG should remain as the main agency of regional development because it has shown its worth in planning for, the extracting, and the processing of the mineral wealth. However, CVG has taken on too great a scope of responsibilities. CVG should release some of its present tasks, especially those related to the planning and construction of roads, schools, etc., and turn them over to other agencies who should be able to handle the tasks more efficiently because of their limited responsibilities.

What is suggested here is that CVG adopt an organizational scheme similar to that of the development corporation of the state of Zulia, CORPOZULIA, which is shown in Figure 14. CORPOZULIA will conduct feasibility studies and then coordinate the activities of the various companies needed to develop a steel plant with a capacity higher than that expected from Plan IV of SIDOR, and a coal mine which will have a capacity of 4 million tons per year. CORPOZULIA will not control directly or manage any of these companies, rather, its role is that of coordinator and problem resolver.

Figure 10. Coordination of the Steel and Coal Programs of the Zulia Region



Source: Corpozulia, Programa Siderurgico del Zulia, Departamento de Relaciones Publicas, Maracaibo, 1977, p. 24.

2) The subsidiary and mixed enterprises are the nucleus for regional development. CVG should allow more self-guidance and direction by these enterprises as a means of creating a more competitive and creative system. Perhaps more aggressive salary policies as a means of attracting and retaining workers, technicians, and professionals can be adopted. CVG has become an extensive bureaucracy where it is easy to shrug off responsibility and decision making. Total separation of these companies from the control of CVG will create independent, self-reliant firms that will take responsibility for their own short-comings and develop new solutions for old problems. CVG could continue its role in the promotion and creation of new mixed enterprises without controlling their management and development.

3) The location of CVG's main offices is in Caracas with a regional office in Ciudad Guayana. This means that the major decisions concerning CVG's future are developed far from where the decisions will be enacted. To increase the effectiveness of CVG, it is recommended that all offices be located in Ciudad Guayana, the main industrial and residential zone of the region.

4) It would be a wise policy for CVG to share some of its experience with the other regional development corporations and with the national universities so that the same

mistakes are not repeated and effective techniques are adopted nationally. Perhaps CVG now has more to offer these organizations than vice-versa. But in the future, the universities and other corporations will have much to offer CVG from their experience and investigations. CVG has received a great deal of advice from American universities such as MIT and Harvard. This advice could prove pertinent and useful for the other regional corporations.

5) The last recommendation is that CVG diffuse its future development projects throughout the region. To date Ciudad Guayana has received a lion's share of the investment and industry as well as the problems of development.

APPENDIX A

VENEZUELA (35)

25

Location: Northern part of South America.

Size: About 352,000 square miles, sixth country in size in Latin America.

Administrative Division: Federal-District, twenty states, two territories, and about seventy-two Caribbean islands administered as Federal dependencies. The country is grouped in 9 regions as a means of coordinating its development.

Population: Nearly 13.5 million in 1977. Heaviest concentration in northern mountain region; 75 percent of total is urban.

Government: Federal Republic. Independent legislative, executive, and judicial branches. Strong executive powers.

Languages: Spanish, the official language, spoken almost universally. Some Indian dialects still in use in more remote areas. English used increasingly in business and professional circles.

Topography: In north, ranges of mountains with peaks up to 16,000 feet extend from Colombian border in west to Atlantic ocean in East. In South, sparsely populated Guiano Highlands make up nearly half of national territory. Extensive lowlands of Orinoco River lie between the two upland regions. Another lowland region surrounds Lake Maracaibo in northwest. More than 1,000 rivers, the most important being the Orinoco, which provides drainage for four-fifths of the country.

Climate: Almost no seasonal change. Dry season commonly referred as summer; the remainder of year, as winter. Average temperatures vary with altitude, ranging from torrid at sea level to cold in high mountains.

Industry: Major industries: petroleum and refining; mining of iron ore; foodstuffs and beverages; chemicals, textiles, and clothing; primary metals and metal products; and transport equipment.

Exports: Principally petroleum and petroleum products (about 90 percent); iron ore (5 percent); cocoa, coffee, sugar, fruit, and rice (2 percent).

Imports: Principally machinery and equipment, certain industrial raw materials, manufactured consumer goods, and some agricultural products (wheat, powdered milk, and cotton).

Table 1
 IRON ORE INDUSTRY PRODUCTION
 BY DEPOSIT RESERVES, 1951-1975
 (thousand tons)

<u>Year</u>	<u>El Pao*</u>	<u>Cerro Bolivar & Cerro Altamira**</u>	<u>San Isidro***</u>	<u>Total Production</u>
1950	200.0	--	--	200.0
1951	1,252.6	--	--	1,252.6
1952	1,977.8	--	--	1,977.8
1953	2,225.1	--	--	2,225.1
1954	2,311.6	3,534.5	--	5,846.0
1955	2,750.0	3,512.5	--	8,262.5
1956	2,833.3	8,088.7	--	10,922.1
1957	3,014.1	12,333.8	--	15,348.0
1958	2,589.2	13,512.0	--	16,101.2
1959	2,645.3	14,637.9	--	17,283.2
1960	2,635.1	17,525.0	--	20,160.0
1961	2,134.4	12,234.4	--	14,368.8
1962	2,772.6	10,532.1	--	13,304.7
1963	1,704.2	10,343.1	--	12,047.4
1964	2,006.1	13,675.0	--	15,681.1
1965	2,984.6	14,525.8	--	17,510.4
1966	3,192.6	14,566.4	--	17,759.0
1967	2,921.0	14,202.5	--	17,123.5
1968	2,840.2	12,662.1	490.3	15,992.7
1969	3,559.7	15,831.5	324.2	19,715.5
1970	2,847.2	18,968.6	312.7	22,128.6
1971	2,740.1	16,825.7	611.7	20,177.8
1972	1,660.4	15,666.2	1,138.3	18,464.8
1973	2,254.1	19,900.7	954.8	23,109.6
1974	3,995.7	22,114.5	313.8	26,424.0
1975	<u>2,148.2</u>	<u>21,956.1</u>	<u>667.5</u>	<u>24,771.5</u>
<u>Total</u>	<u>64,194.6</u>	<u>309,149.5</u>	<u>4,813.3</u>	<u>378,157.5</u>

Source: Ministry of Mines and Hydrocarbons, Annual Report-1975,
 Caracas, Venezuela, 1976, P.30.

*operated by Iron Mines Company of Venezuela until 12/31/74

**operated by Orinoco Mining Company until 12/31/74

***operated by SIDOR

All these deposits are now operated by CVG-FERROMINERA

Table 2

VENEZUELAN IRON ORE RESERVES
IN MILLIONS OF METRIC TONS AS OF JANUARY, 1976.

<u>Deposit</u>	<u>Proven Ore Grade Greater Than 55%</u>	<u>Proven Ore Grade Less Than 55%</u>	<u>Probable O.G. More Than 55%</u>	<u>Probable O. Less Than 5</u>
Cerro Bolivar	271	n.e.	--	--
El Pao	65	n.e.	--	--
San Isidro	393	n.e.	--	--
San Joaquin	65	n.e.	85	--
Los Poilas	80	n.e.	40	--
Los Barrancos	252	n.e.	300	--
Punta de Cerro	50	--	--	--
El Trueno	110	--	--	--
Maria Luisa	--	258	--	--
Cerro Toribio	18	n.e.	--	--
Grupo Redondo	165	--	--	--
Arimagua	136	n.e.	--	--
Cerro Piacoa	11	170	--	--
Cerro Altamira	150	--	--	--
Punta de Cerro	50	--	--	--
Concesiones Rondon	165	--	--	--
Las Grullas	48	--	--	--
Others	<u>42</u>	<u>--</u>	<u>364.6</u>	<u>766</u>
Total	2,071	428	789.6	766

Source: Ministry of Mines and Hydrocarbons, Weekly Letter,
V. XIX, N. 11, March 13, 1976, Caracas, Venezuela,
P. 19.

CVG-FERROMINERA ORINOCO, Our Progress is Forged with
Iron Ore, Public Relations Division, Caracas, Venezuela,
1976, P.19.

*These deposits form the San Isidro Cuadrilateral.

Table 3

Venezuelan Gross National Product, 1959-1974
(million dollars)

Years	Wages and Salaries	Taxes	Depreciation		Total Contribution	Gross National Product (GNP)	Total Contribution %
			De Pretration	Amortization and Depletion			
1959	18.5	21.0	10.7		50.2	5,504.2	.91
1960	19.3	55.6	12.6		87.6	5,482.3	1.60
1961	21.0	25.0	10.3		56.3	5,738.4	.98
1962	20.0	19.2	15.0		54.2	6,232.6	.86
1963	19.0	15.4	15.1		49.5	6,821.6	.73
1964	19.3	35.1	10.0		64.4	7,538.1	.85
1965	20.0	45.4	9.5		74.9	8,008.0	.93
1966	20.6	44.7	10.1		75.4	8,400.0	.89
1967	20.4	43.0	9.6		73.0	8,919.3	.82
1968	23.0	28.4	9.4		60.8	9,672.8	.63
1969	23.0	45.0	10.5		78.5	10,126.0	.77
1970	24.1	60.0	11.1		95.2	11,387.7	.84
1971	24.4	50.4	15.0		89.8	12,341.4	.73
1972	27.2	35.8	14.7		77.7	13,643.0	.57
1973	30.6	59.0	17.0		106.1	16,191.0	.65
1974	67.2	89.1	14.0		170.3	25,221.0	.68

Source: Bamco Central de Venezuela, Annual Report, 1975, Caracas, Venezuela, p. 260

Ministry of Mines and Hydrocarbons, Annual Report, 1975, Department of Mineral Economics, Caracas, Venezuela, 1976.

Table 4

VENEZUELAN STEEL INDUSTRY
 EXPORTS AND IMPORTS, 1963-1975
 (thousand metric tons)

<u>Year</u>	<u>Exports</u>	<u>Value in Million \$</u>	<u>Imports</u>	<u>Value in Million \$</u>
1963	144	7.5	419	70.3
1964	122	6.4	513	87.4
1965	67	5.5	537	108.0
1966	46	4.5	409	81.9
1967	280	21.2	478	85.0
1968	269	18.3	496	87.4
1969	231	19.0	551	107.4
1970	185	15.2	581	127.0
1971	87	7.9	567	125.4
1972	251	20.3	630	134.3
1973	227	27.1	1,050	221.5
1974	49	7.6	1,027	446.5
1975	2	.7	--	--

Source: CVG-Siderurgica del Orinoco, S.A. Marketing,
 Research Dept, Caracas, p. 178

Table 5VEZUELAN STEEL INDUSTRY PRODUCTION, 1966-1975
(thousand metric tons)

<u>Year</u>	<u>Pig Iron</u>	<u>Steel</u>
1966	351,385	536,821
1967	422,202	690,420
1968	613,850	861,135
1969	519,760	840,129
1970	509,679	927,189
1971	515,414	923,794
1972	535,806	1,126,606
1973	545,785	1,062,937
1974	544,735	1,030,703
1975	534,633	1,008,886
1976	426,935	754,076

Source: CVG-Siderurgica del Orinoco, 1976, Marketing Research Department, Caracas, p.150.

Table 6
CVG-SIDERURGICA DEL ORINOCO
FINANCIAL INFORMATION
(million dollars)

<u>Description</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>
Gross Revenue	135	155	223	360	422
Other Revenue	2	45	4	6	9
Total Revenue	137	159.5	227	366	431
Operating Costs	105	124	147	327	270
Depreciation	21	22.5	25	30	36
Administrative Exp.	6	8	6	7	10
Interest	--	--	11	24	30
Total Expenditure	132	154	120	331	402
Net Oper. Income	5	5	37	34	28
Bonus to Personnel	2.4	3	7	9	10
Net Income	2.6	2	30	25	18
<u>Financial Situation</u>					
Current Assets	106	140	354	481	621
Current Liabilities	(57)	(97)	(221)	(227)	(633)
Working Capital	49	43	133	254	(12)
Net Fixed Assets	549	612	690	969	1743
Accounts Receivable	--	205	153	--	--
Other Activities	2.5	2.5	2	14	21
Sub-total	600	657	825	1236	1752
- Accounts Payable	172	216	207	391	694
- Personnel Cum. Comp.	10.5	12	21	26	35
Sub-total	183	228	228	417	729
Net Capital	417	429	597	819	1023

Source: CVG-Siderurgica del Orinoco, 1976, Informe Anual,
Departamento de Relaciones Publicas, Caracas, p. 59.

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Table 7

IRON ORE INDUSTRY: PRODUCER COUNTRIES
(million metric tons)

<u>Country</u>	<u>1954</u>	<u>1975</u>
U.S.S.R.	64.3	235
U.S.A.	79.4	95
France	43.8	64
Canada	6.7	57
Sweden	15.3	37
India	5.8	37
Venezuela	5.8	24.8
Brasil	3.1	62
West Germany	13.0	7.5
Peru	2.2	15.4
Chile	2.0	11.3

Source: Ministry of Mines and Hydrocarbons, 1976,
Mineral Economics Dept., Caracas, Vene-
zuela, p. 89. 89.

U.S. Bureau of Mines, 1974, Minerals Yearbook,
Washington.

Table 8

VENEZUELA IRON ORE INDUSTRY--VOLUME OF EXPORTS
(million tons)

<u>Year</u>	<u>Iron Ore</u>	<u>\$</u>	<u>Petroleum</u>	<u>%</u>	<u>Other</u>	<u>%</u>	<u>Total</u>	<u>%</u>
1958	15.6	11	126.7	88	.12	1	142.5	100
1959	17.0	11	135.5	88	.13	1	152.6	100
1960	19.3	12	141.5	88	.13	1	161.0	100
1960	14.6	9	144.7	91	.20	1	159.5	100
1962	13.3	8	157.5	92	.36	1	171.2	100
1963	12.4	7	160.1	92	.59	1	173.1	100
1964	14.9	8	168.9	92	.47	1	184.3	100
1965	17.0	9	170.8	91	.44	1	188.3	100
1966	17.1	9	167.2	91	.44	1	184.7	100
1967	16.4	8	180.0	91	.74	1	197.1	100
1968	15.0	8	180.3	92	.65	1	196.0	100
1969	19.0	9	181.0	90	.75	1	200.7	100
1970	21.1	10	186.0	89	.71	1	207.9	100
1971	19.1	10	177.5	90	.80	1	197.5	100
1972	16.5	9	166.6	91	.88	1	183.9	100
1973	21.6	11	171.7	88	1.64	1	195.0	100
1974	26.3	15	146.6	84	2.05	1	175.5	100

Source: Ministry of Mines and Hydrocarbons, Annual Reports, 1975, Caracas, Venezuela, P. 12.

Table 9

IRON ORE INDUSTRY--~~VALUE~~ OF EXPORTS
(million dollars)

<u>Year</u>	<u>Iron Ore</u>	<u>%</u>	<u>Petroleum</u>	<u>%</u>	<u>Other</u>	<u>%</u>	<u>Total</u>	<u>%</u>
1958	92.5	5	1651.0	92	52.0	3	1796.0	100
1959	100.2	6	1547.4	91	53.7	3	1701.4	100
1960	122.3	7	1544.4	86	128.6	7	1795.4	100
1961	97.0	6	1590.0	92	40.0	2	1727.0	100
1962	87.2	5	1683.7	92	49.1	3	1820.0	100
1963	71.6	4	1678.1	92	68.6	4	1820.1	100
1964	86.0	4	2357.6	93	80.0	3	2523.7	100
1965	125.6	5	2359.1	93	56.1	2	2540.7	100
1966	126.0	5	2266.5	92	62.8	3	2455.4	100
1967	120.7	5	2442.8	92	85.6	3	2649.1	100
1968	105.1	4	2468.8	93	80.5	3	2654.4	100
1969	133.0	5	2483.9	92	90.9	3	2707.9	100
1970	150.7	5	2551.9	91	117.2	4	2819.7	100
1971	147.0	4	3134.6	91	169.5	5	3451.1	100
1972	131.4	3	3509.3	93	143.3	4	3784.0	100
1973	184.6	3	5187.4	95	127.7	2	5499.7	100
1974	266.5	2	14326.6	96	261.6	2	14856.8	100

Source: Ministry of Mines and Hydrocarbons, Annual Reports 1974, 1975, Caracas, Venezuela. P. 14.

Table 10
 IRON ORE INDUSTRY, 1958-1974
 DISTRIBUTION OF INCOME FROM FOREIGN EXCHANGE
 IN MILLION DOLLARS

<u>Year</u>	<u>Total</u>	<u>%</u>	<u>Petroleum</u>	<u>%</u>	<u>Iron</u>	<u>%</u>	<u>Other</u>	<u>%</u>
1958	1,970	100	1,340	68	69	3.5	562	28.5
1959	2,107	100	1,611	74	62	2.9	494	23.1
1960	2,521	100	1,406	55	70	2.8	1,025	42.2
1961	1,741	100	1,350	78	122	7.0	269	15.0
1962	1,603	100	1,255	78	63	3.9	285	18.1
1963	1,669	100	1,337	80	53	3.2	279	16.8
1964	1,850	100	1,397	76	43	2.4	410	21.6
1965	1,899	100	1,371	72	51	2.7	477	25.3
1966	2,051	100	1,369	67	99	4.8	583	28.2
1967	2,259	100	1,536	68	68	3.0	655	29.0
1968	2,304	100	1,587	69	57	2.4	660	28.6
1969	2,382	100	1,595	67	48	2.0	739	31.0
1970	2,640	100	1,686	64	80	3.0	874	33.0
1971	3,421	100	2,165	63	89	2.6	1,167	34.4
1972	4,081	100	2,190	54	76	1.9	1,815	44.1
1973	5,585	100	3,044	55	86	1.6	2,455	43.4
1974	13,078	100	9,377	72	187	1.4	3,514	26.6

Source: Venezuela's Central Bank, 1975, Annual Report, Caracas, p. 19.

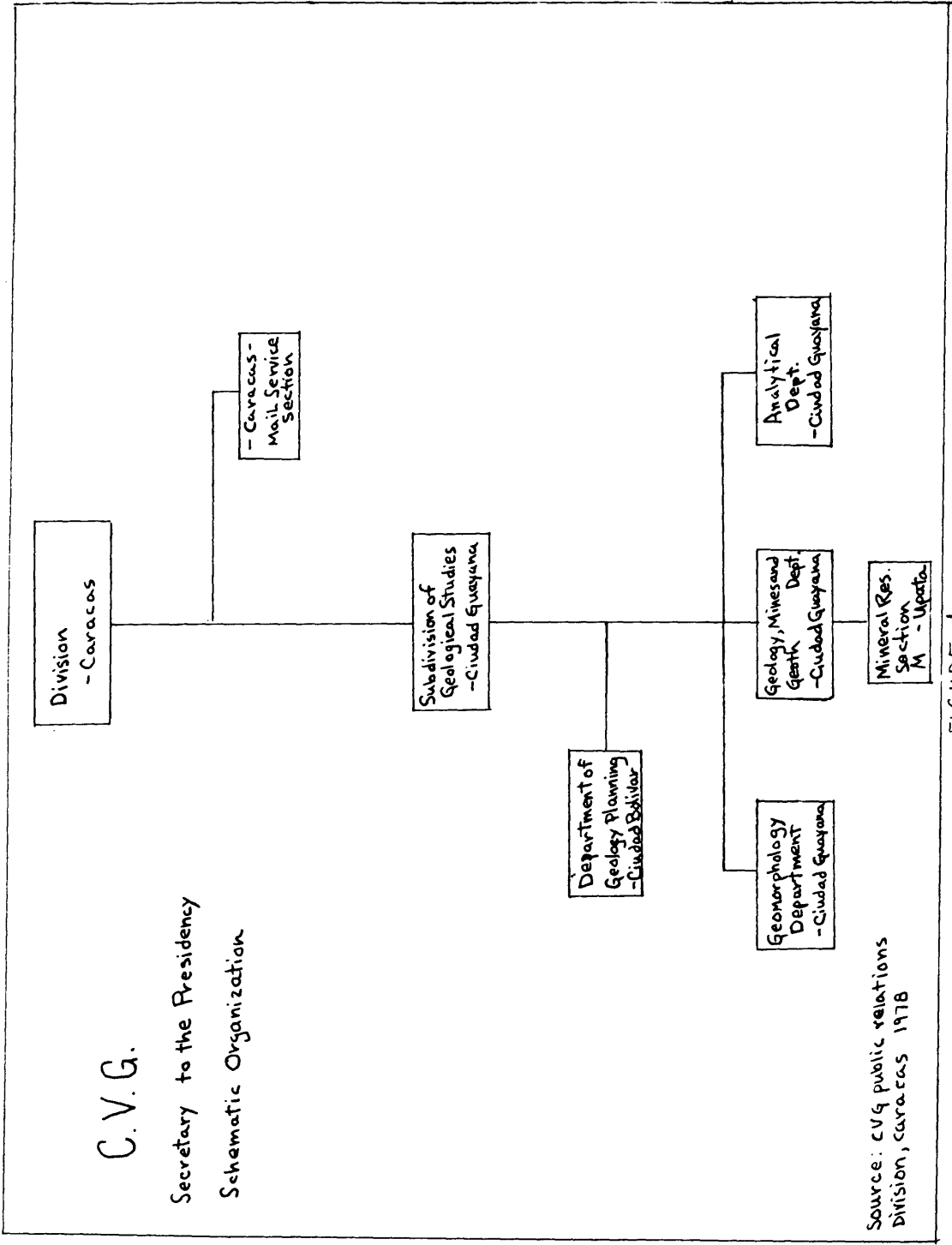
APPENDIX B

APPENDIX B

Schematic Organization of Each of CVG's Divisions

Figure 1. Secretary of the Presidency Division

2. Studies, Programming, and Research Division
3. Personnel Development and Coordination Division
4. Public Relations Division
5. Managerial Information Division
6. Industrial Development Division
7. Regional and Urban Development Engineering Division
8. Agriculture Development Division
9. Financial Division
10. Human Development Division



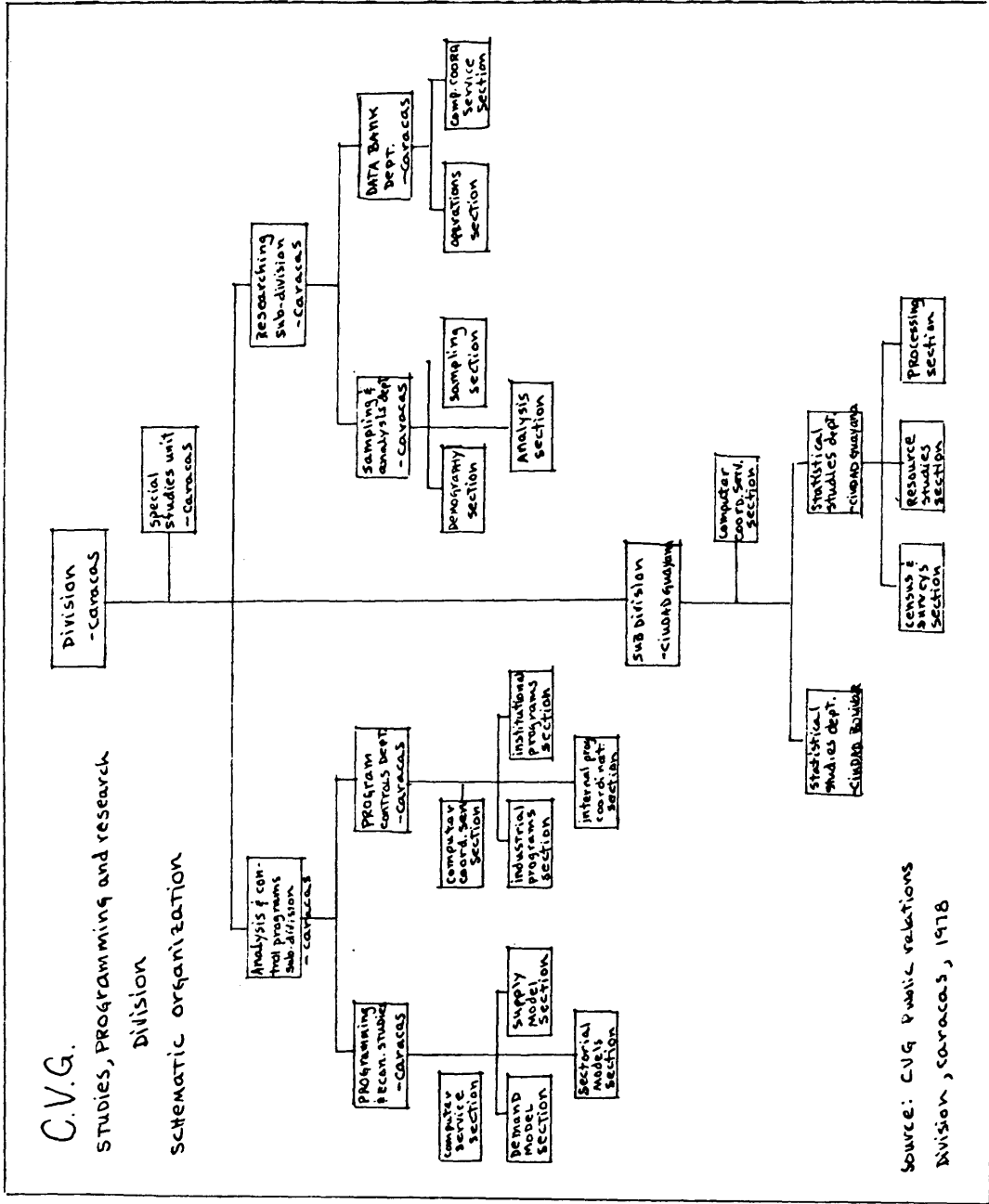


FIGURE 2

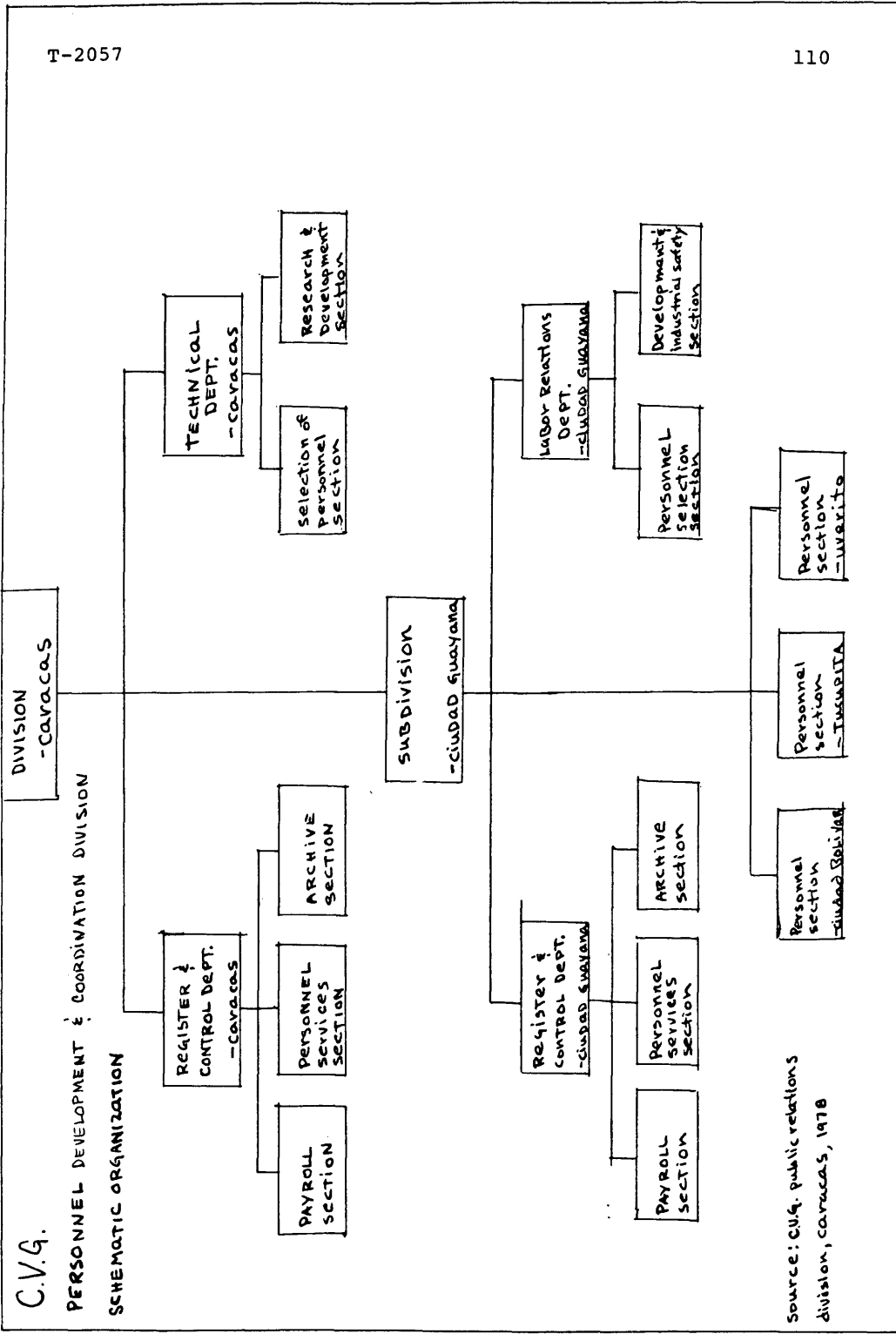


FIGURE 3

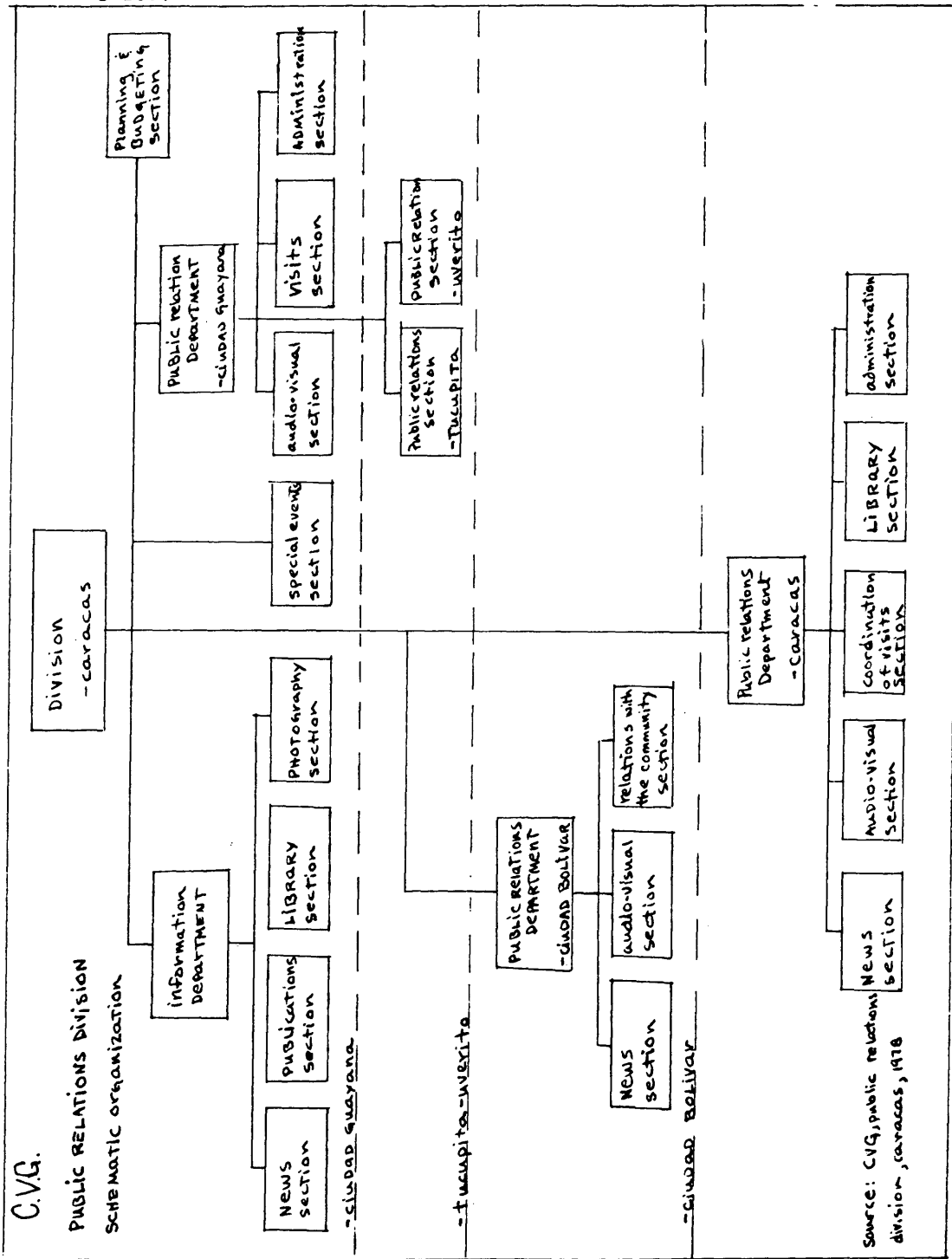
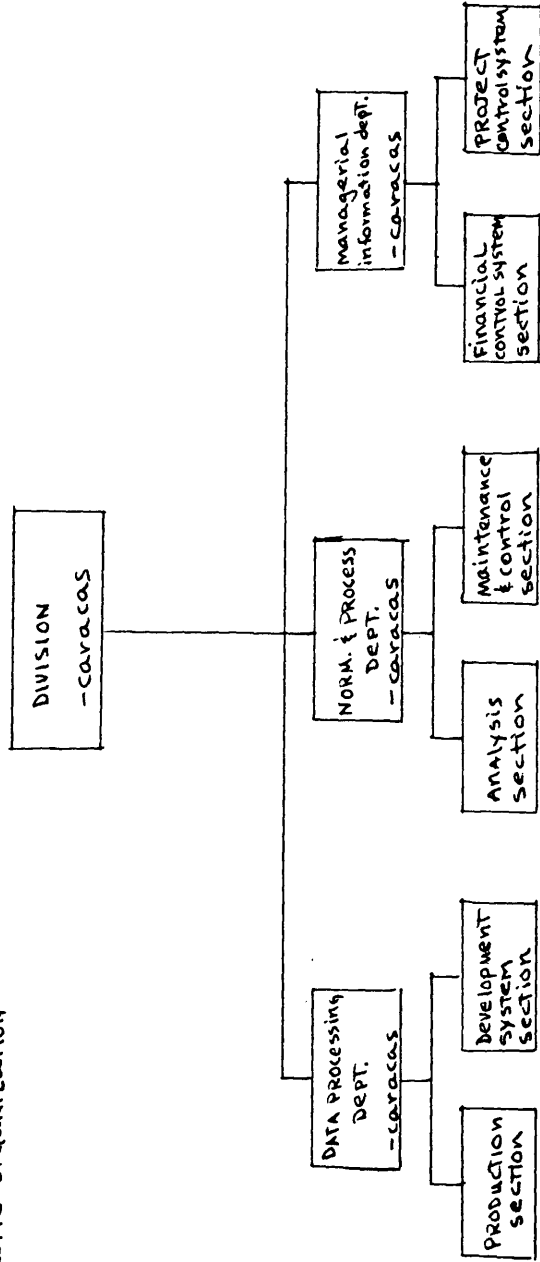


FIGURE 4

C.V.G.

Managerial information division
SCHEMATIC ORGANIZATION

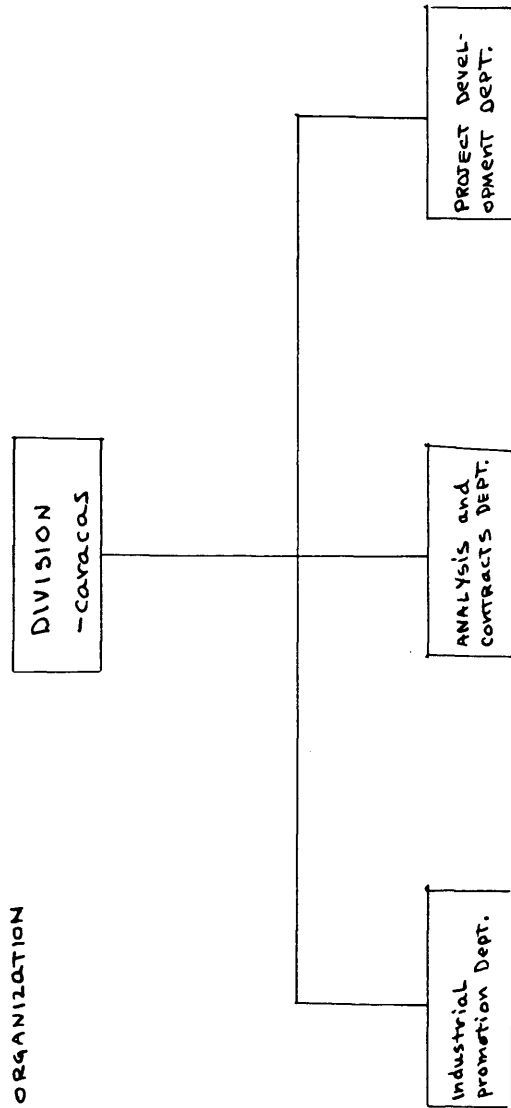


Source: C.V.G.-public relations
Division, CARACAS, 1978

FIGURE 5

C.V.G.

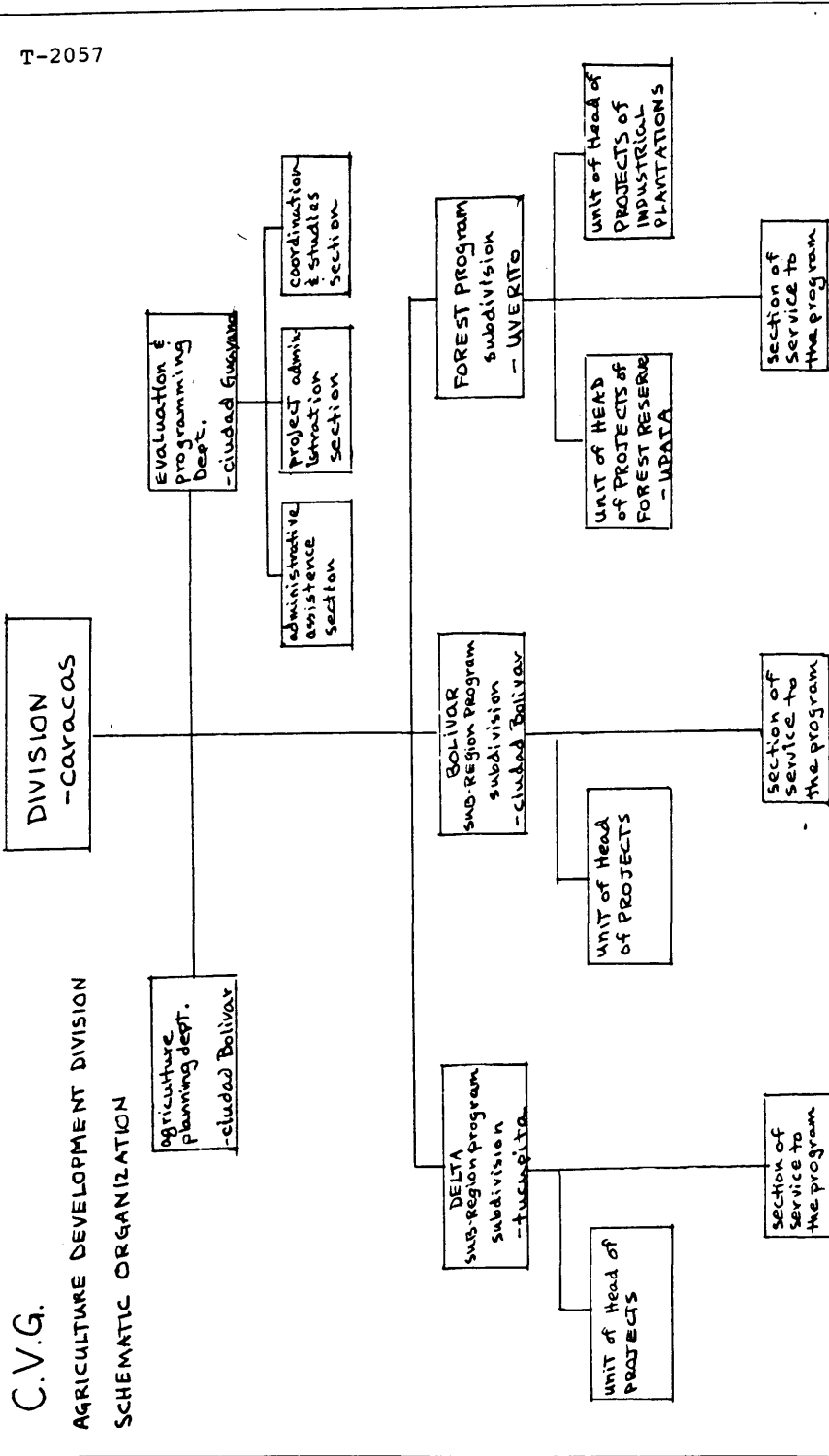
INDUSTRIAL DEVELOPMENT DIVISION
SCHEMATIC ORGANIZATION



SOURCE: CUG - public relations
division, Caracas, 1978

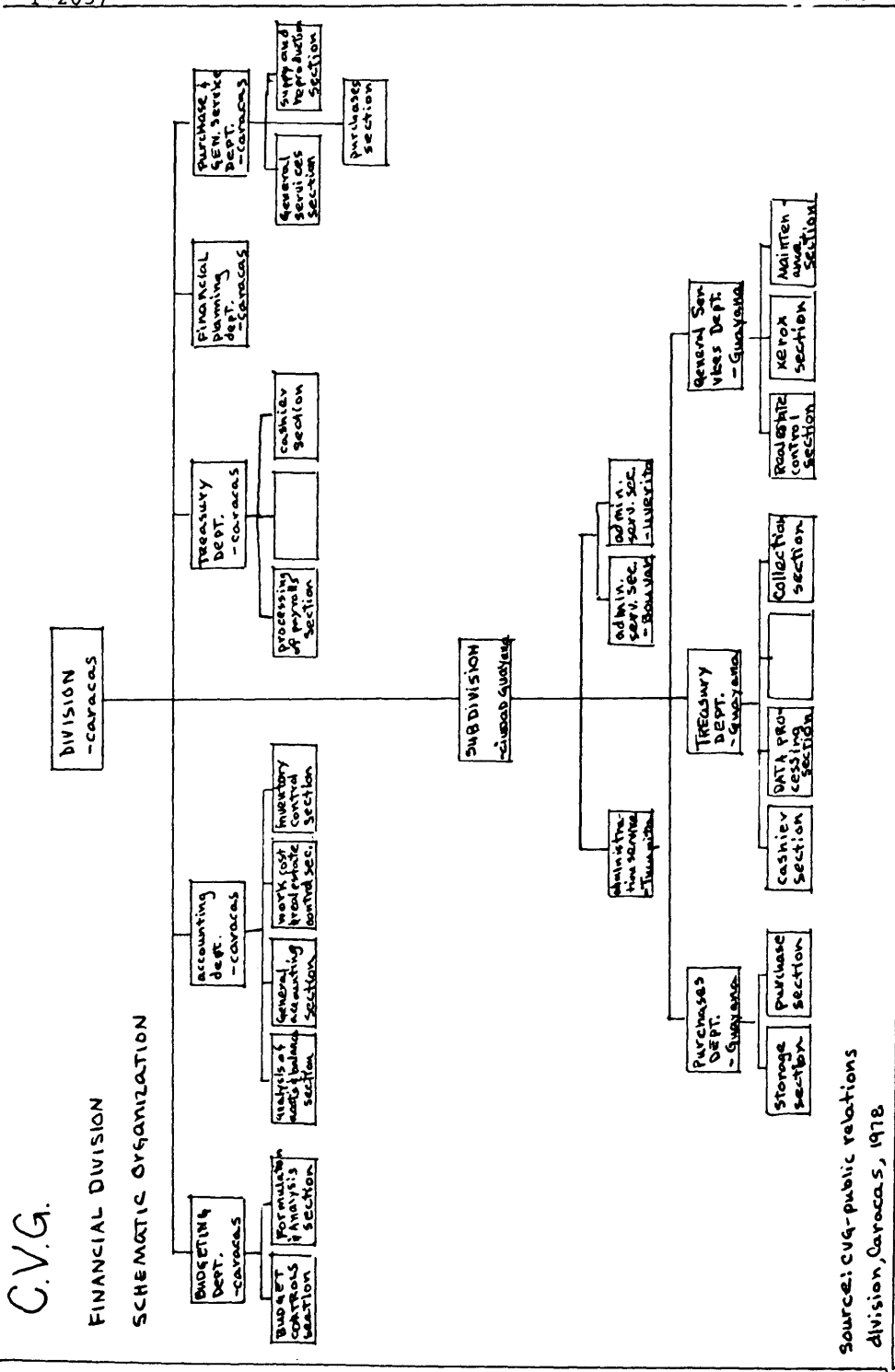
FIGURE 6

C.V.G.
 AGRICULTURE DEVELOPMENT DIVISION
 SCHEMATIC ORGANIZATION



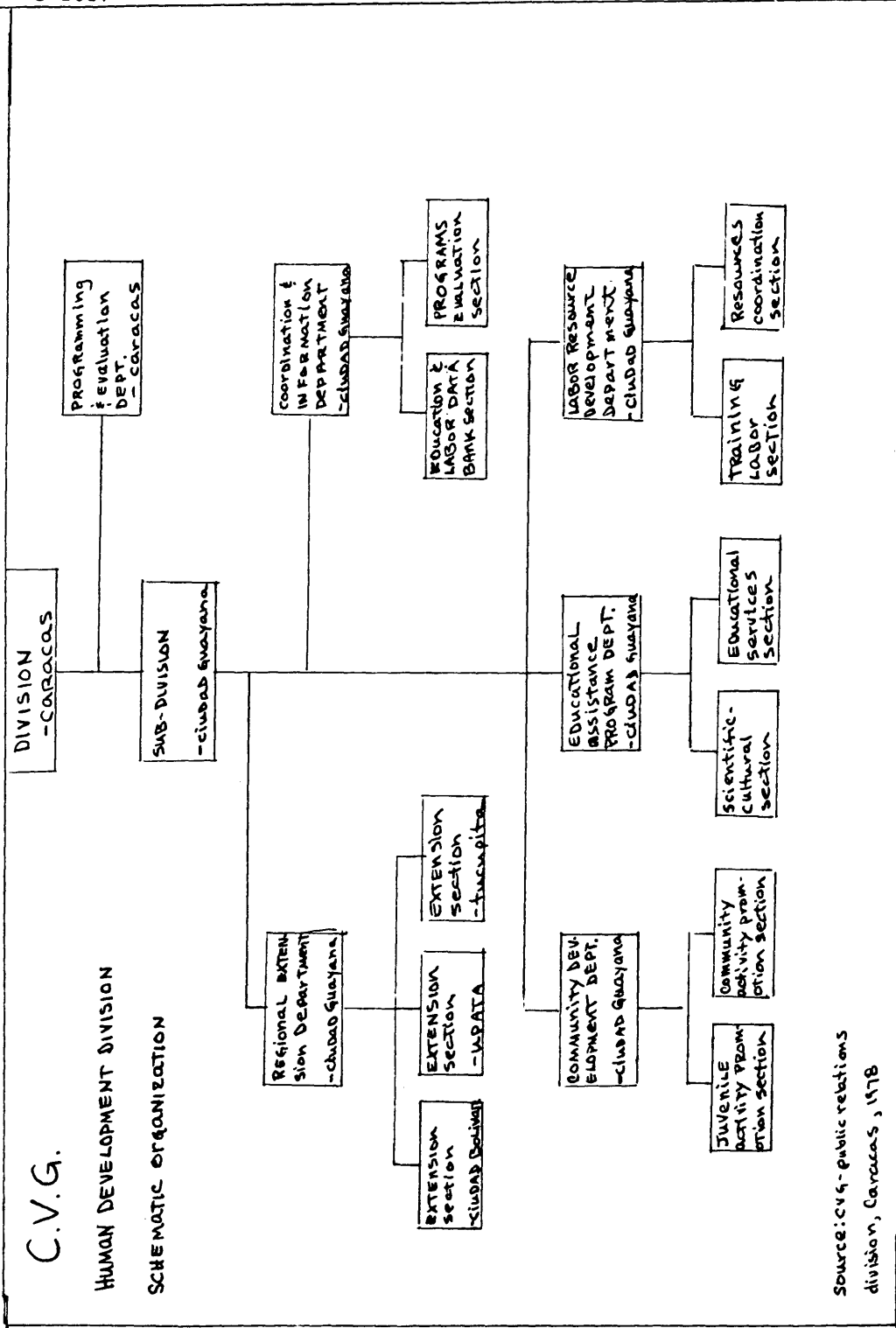
SOURCE: CVG - PUBLIC RELATIONS
 DIVISION, CARACAS, 1978

FIGURE 8



Source: C.V.G.-public relations division, Caracas, 1978

FIGURE 9



Source: C.V.G. - public relations division, Caracas, 1978

FIGURE 10

REFERENCES

- (1) Presidential Decree Number 1331, on December 16; 1975.
Published on the Official Gazzete Number 30890, on
January 9, 1976, Caracas.
- (2) Presidential Decree Number 929, on April 5, 1972.
- (3) Same as 1.
- (4) It reinforces Presidential Decree Number 72, on
June 11, 1969.
- (5) By decision-Law of the Legislative branch of the State of
Bolivar on July 15, 1961.
- (6) CVG, Annual Report 1975, Caracas, 1977.
- (7) Presidential Decree Number 108 on July 31, 1959. Pub-
lished on the Official Gazzete Number 26028 on August 5, 1959.
- (8) Presidential Decree Number 430 on December 29, 1960.
Published on the Official Gazzete Number 26445 on December
30, 1960.
- (9) Presidential Decree Number 67 in 1963.
- (10) Presidential Decree Number 929 on April 5, 1977.
- (11) Most of this section is developed under information
released by the Public Relations Divisions through
personal interview of the author with some officials
of CVG.
- (12) Presidential Decree Number 580 on December 7, 1974.
- (13) Quotation to the President of Venezuela from his
Presidential Decree Number 580.
- (14) Thomas E. Wheil, 1971, Area Handbook of Venezuela,
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