The performance of six agricultural commodities (rice, corn, black beans, potatoes, cotton and sisal) that have been participating in the support price program of Venezuela were analyzed by historical series of production, area harvested, and yields and through multiple regression analysis.

It was evidenced that the Venezuelan production of these six supported commodities responded basically to increases in area harvested more than to any other factor, and that the support price program was not significant statistically for production determination of any one of the commodities. However, it was found that production in general increased for each crop (except black beans) more rapidly than nonsupported crops after the beginning of the support price program, so further analysis was necessary to explain this contradiction. Such analysis showed that area harvested was
determined first by the support price program in the form of a guaranteed price and secondly by government agricultural loans.

The dependency of production on public decision, the inability or unwillingness of farmers to take advantage of opportunity costs, the absence of fundamental information for the decision-making process and the low yields for all of the supported commodities were interpreted as indexes of poor farm management in the production of the supported commodities.

The relevant problems of the support price program in Venezuela are presented. It was found that many of them can be traced to the absence of a clear policy that establishes measurable goals and objectives for the program, and to the absence of basic research to help farmers in their decision-making process. Based on these results, some recommendations were made which try to give a fundamental framework to the establishment of a new support program and direction to the disposition of surplus, if any, in the domestic and in the world markets. It is also recommended that basic research about soils, fertilizers, and crops interaction be carried out, and that a re-appraisal of the present system of exportation be made to favor those commodities that have comparative advantage in the international market.
The Agricultural Support Price Program in Venezuela and Its Consequences in Economic Development

by

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A THESIS submitted to Oregon State University in partial fulfillment of the requirements for the degree of Master of Science June 1969
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Date thesis is presented August 30, 1968

Typed by Velda D. Mullins for Juan Bautista Stredel
ACKNOWLEDGMENT

This thesis has a special significance for me. It gave me the opportunity to do an almost complete analysis of the agricultural support price program in my country. I hope it is useful to the Banco Agrícola y Pecuario (the institution that sponsored my studies in the U.S.) and other agricultural agencies and students in Venezuela.

I am in debt to the Board of Directors of the B.A.P., especially its President, Dr. Felipe Gómez Alvarez, who made opportunity for study available to me.

I would like to express my acknowledgment to Dr. Alejandro Osorio, my professor of Agricultural Economics in my undergraduate courses, who invited me to work in the fascinating field of Agricultural Economics.

I am especially indebted to my major professor Dr. Grant E. Blanch who devoted much of his time in giving me wise guidance throughout my course work and patiently corrected the drafts of this thesis and made valuable observations and suggestions. Moreover he gave me more than one can expect of a busy professor using his personal friends in trying to complete my education with direct observations of farm enterprises and their administration. His help and friendship has all my gratitude.
Thanks go to the people in Venezuela that collaborated with me in finding the necessary data to do this study and to the graduate students of the Department of Agricultural Economics of this University that made the English corrections of the drafts. Without their collaboration this study would not have been accomplished.

Finally, I want to thank Gladys, my wife, who during the period of my studies gave me much love and dedication and received very little from me, and taught our children, John and Rafa, to love their father even though he was not able to pay much attention to them.
## TABLE OF CONTENTS

### I. INTRODUCTION
- The Development of Agricultural Support Prices in Venezuela ........................................ 4
- The Philosophy of Support Price Programs in Venezuela ......................................................... 7
- A summary of the Problems ........................................................................................................ 9
- Purpose of Thesis ....................................................................................................................... 12
- Methodology and Source of Data .............................................................................................. 13
- Limitations of the Thesis ........................................................................................................... 17

### II. THE AGRICULTURAL SECTOR IN VENEZUELA
- Production, Area Harvested and Yield ................................................................................ 27
  - Rice ................................................................................................................................. 29
  - Corn ............................................................................................................................... 36
  - Black Beans .................................................................................................................... 40
  - Potatoes ......................................................................................................................... 45
  - Cotton ............................................................................................................................ 49
  - Sisal .................................................................................................................................. 54
- Prediction Models of Production and Area Harvested for the Supported Commodities .... 64

### III. INTERRELATIONSHIP BETWEEN THE AGRICULTURAL SECTOR AND THE OTHER SEGMENTS OF THE ECONOMY
- The Gross National Product and National Income ................................................................. 87
- Labor Force and Its Remuneration ......................................................................................... 102
- Capital Formation ................................................................................................................ 104

### IV. THE MARKET FOR THE SUPPORT PRICE COMMODITIES
- Demand and Supply ............................................................................................................... 113
- Processing and Other Costs for Supported Surplus Commodities ....................................... 121
- The International Market for Venezuelan Price Supported Agricultural Commodities .... 124

### V. THE PRICE SUPPORT PROBLEMS IN DETAIL AND THE DISPOSITION OF AGRICULTURAL SURPLUS
- The Problems ......................................................................................................................... 129
1. Public Difficulties in Changing the Trend of Production of the Supported Commodities 129
2. Storage ........................................... 130
3. Financing .......................................... 132
4. Allocation of Resources ......................... 133
5. Unclearness of the Philosophy of the Support Price Program in Venezuela .............. 143

PossibleDisposition of the Agricultural Surpluses ........................................ 146

VI. CONCLUSIONS AND RECOMMENDATIONS .......... 154

BIBLIOGRAPHY ............................................. 164
LIST OF TABLES

1. The Agricultural Gross Product of Venezuela, by Commodities at 1957 Prices ........................................ 21

2. Annual Growth Rates of the Agricultural Sector of Venezuela ................................................................. 25


5. Changes in Corn Production in Venezuela, 1948-67 .................................................................................. 37


10. Interannual Variations of Land Harvested in Venezuela Sub-sector Vegetables ........................................ 59

11. Percent of Land Use in Venezuela by the Supported Commodities and the Vegetable Sub-Sector as a Whole. Selected Years. .................................................. 61


13. Association Between $Y$ and $X_1', X_2', \text{ and } X_4$ According to Model One ........................................... 67

14. Association Between $Y$ and $X_1', X_2', \text{ and } X_3$ According to Model Two ........................................ 69
15. Association Between Y and $X_1$, $X_2$, and $X_3$ According to Model Three ........................................ 71
16. Association Between Y and $X_1$, $X_2$, $X_3$, and $X_4$ According to Model Four ........................................ 73
17. Predicted $\hat{Y}$ According to Models "1", "3", and "4" as Compared with Actual Y ........................................ 75
18. Association Between Area and $X_1$, $X_3$, and $X_4$ According to Model Five ........................................ 81
19. Association Between Area and $X_1$, $X_3$, and $X_4$ According to Model Six ........................................ 83
20. Predicted $X_2$ According to Models Five and Six as Compared with the Actual $X_2$ in Thousand of Hectares ........................................ 86
25. Venezuela: Gross Investment by Sectors ........................................ 106
26. Venezuela: Accumulated Gross Foreign Investment ........................................ 109
27. Venezuela: Net Capital Investment ........................................ 111
28. Venezuela: Gross Product Per Unit of Net Capital Invested ........................................ 111
29. Venezuela: Price Elasticity of Demand and Income Elasticities for Selected Commodities, 1962 ........................................ 119
30. Venezuela: Approximate Cost of 100 Kgs. of Polished Rice, Alongside the Mill and at the Port ........................................ 124
# LIST OF FIGURES

1. **Index Numbers of Production, Area Harvested and Yield of Rice in Venezuela, 1948-1967** ............... 32

2. **Index Numbers of Production, Area Harvested and Yield of Corn in Venezuela, 1948-67** ............... 38

3. **Index Number of Production, Area Harvested and Yield of Black Beans in Venezuela, 1952-67** ........... 43

4. **Index of Production, Area Harvested and Yield of Potatoes in Venezuela, 1948-1967** ................. 47

5. **Index of Production, Area Harvested and Yield of Cotton in Venezuela, 1948-1967** ................. 52

6. **Index Number of Production, Area Harvested and Yield of Sisal in Venezuela, 1952-1967** ............. 56
The territory of Venezuela consists of 91,205,000 hectares (225,527,635.0 acres). Of these hectares, 26.2 million was listed as agricultural land in 1961; i.e., 28.7% of the total. Nevertheless, all this land cannot be cultivated; much of it is located in the plain region, where the most extensive cattle farms are located. This land is subject to drought in the period January to May and overflow during the rain season June to November. Other parts of the so-called agricultural land are located along the eroded slopes of the Andes Mountains and other parts are of irregular topography which makes economical cultivation impossible. It was also estimated in 1961 that from the 26.2 million hectares, 1.7 million hectares were in permanent use with perennial and annual crops. Improved pasture was produced on 2.7 million hectares, while native grass covered 14.0 million hectares and fallow land covered 2.4 million hectares. The rest of the figure 6.2 million hectares was taken up by forests and other uses (3). The number of farms was found in the same year to be 315,215 with an average area of 83 hectares.

The total population working in agriculture in 1961 was estimated at 778,000 persons or approximately 10% of the total.
population for that year. The rural population 1/ was estimated at approximately 3.4 million people in 1965; i.e., 37% of the total population (3). Although working in the same sector, this population is not a homogeneous group; rather there are two well differentiated kinds of farmers: a) the campesinos 2/ which make up more than 90% of the total rural population, and b) the commercial farmers. The "campesinos" are either independent farmers or are members of a land resettlement cooperative. The land resettlement cooperatives generally are members of a national federation. Commercial farmers are organized together in a national federation. In addition, they have founded, under the encouragement of the Ministry of Agriculture, specific commodity boards. The federations, commercial farmer associations and commercial commodity boards are pressure groups that have always tried to get better treatment from the government for their groups.

"Campesinos" and commercial farmers are both financed through the Ministry of Agriculture and its agency, the Agricultural and Livestock Bank "B.A.P.". The Bank, which is almost totally

1/ Rural population is identified by the Office of Census of Venezuela as those people that live in towns of 5,000 or less inhabitants. 2/ This term will be used through the thesis to indicate a nomad farmer, the tenant, or owner (after the agrarian reform law) of a small piece of agricultural land, who works it using traditional tools.
autonomous, is the executor of the agricultural credit program of Venezuela and has all responsibility from budgeting to collecting the loans, excepting those special credit programs which are planned by the Ministry of Agriculture. The National Congress appropriates an annual sum through the Ministry of Agriculture to the Bank. This money is not paid back to the treasury because the B.A.P. also administers social welfare programs. The treasury contribution, together with the bank’s own funds and the funds for special programs of the Ministry, form almost all the external flow of money that goes to the sector. Commercial banks generally refuse to finance farming activities, alleging that risks are too high.

A characteristic of the Venezuelan agriculture is its high costs of production. One reason is because light and heavy machinery is imported along with significant quantities of agricultural chemicals. In addition a segment of the labor force, i.e., tractor drivers and other machine operators, is expensive. These factors are a heavy part of the operational cost of a farm.

Although Venezuela cannot be considered a country depending on its agriculture because this sector contributes only seven percent of the gross national product, current government policy emphasizes developing the agriculture sector for four principal reasons: a) it is necessary to supply food to a population that grows at an
annual rate of over 3.5%; b) it is necessary to raise the standard of living of the rural population which accounts for over 35% of the total; c) industrialization needs from agriculture the raw materials used in its manufactured products; and d) Venezuela needs to conserve its foreign exchange for strategic chemicals, minerals, precision instruments and technical machinery.

The Development of Agricultural Support Prices in Venezuela

History sets 1938 as the year in which an agricultural commodity price support program began in Venezuela (34). At that time, due to changes in the structure of the domestic economy, the currency exchange ratio of bolívar-dollar \(^2\) declined from Bs. 7.00/\$1.00 to Bs. 3.35/\$1.00. Because the main source of foreign exchange came from the exportation of coffee and cocoa, the income of the producers of these crops was seriously affected. Growers were receiving Bs. 3.65 less for each dollars worth of coffee or cocoa sold in the foreign market.

To avoid the bankruptcy of these farmers and the disappearance of an important source of foreign exchange, the government decided to create what was called "dollar coffee" in 1938 and "dollar cocoa".

\(^2\) The national currency of Venezuela is the bolívar (Bs.) and its actual rate of exchange is $.222.
in 1942. These were at the beginning a fixed subsidy and later price differentials that varied according to the price farmers sold the product in the international market and a minimum guaranteed price for each 46 Kgs. so sold. As can be seen, the support price varied in general from crop year to crop year and was determined ex-post. The government and growers did not know in advance how much the unit subsidy would be for the next year.

From the foregoing it can be seen this program did not originate from any long range, overall plan but the interest solely was to maintain, in an indirect way, the money income to coffee and cocoa farmers without reference to purchasing power or real income. Nevertheless, it has to be recognized that this program was the beginning of agricultural support prices in Venezuela. It did not have the sophisticated complications that support programs have today in Venezuela and other countries. It must be mentioned that the program is still in effect, but subsequent changes in the bolivar-dollar exchange ratio has modified the magnitude of the subsidy. During 1961 the exchange ratio varied to Bs. 4.50 per dollar, and because the subsidy for coffee had a narrower base than cocoa, the new exchange ratio has been enough so the subsidy.

---

4/ The Central Bank buys the dollars produced by the exportation of coffee and cocoa at the ratio Bs. 4.485/dollar.
government has not paid any subsidy for coffee exported since 1962. It still pays for cocoa exportations.

The necessity of developing the agricultural sector became clear in the 1940s. Almost all the food was imported and farms had a very low productivity. The idea of substituting the agricultural commodities that could be produced in Venezuela for those imported, acquired national support. The main interest was centered on those foods that provided the mainstay of the daily diet. A support price program as an incentive to increase the production of corn, rice and black beans was instituted. For equal reasons and with equal purposes beef was also supported in 1941 and cotton in 1951. However, there is no evidence these programs were used extensively between 1949-58 and no great interest was evidenced in the overall development of the agricultural sector of the economy. During the period 1956-58 the program was applied only to the production of corn.

During 1958 and 1959 farmers began to organize themselves. The "campesinos" formed a federation and quickly acquired influence in the government. The commercial farms strengthened their commodity boards for each commodity they produced for the market. One of the first demands of these organizations was a stable and wider support price program. In 1959 rice was included among the farm commodities being supported. By 1961 the following
agricultural commodities were protected by support prices: corn, rice, black beans, white and red potatoes, cotton, coffee, cocoa and sisal. These commodities have been supported in a continuous manner to the present time. Standard grades for all these commodities were established in a way similar to those established by the U. S. Department of Agriculture. For example, the support price on black beans was fixed at Bs. 1.10/Kg. \(^5\) minus deduction for excess moisture, foreign materials, damaged kernels and so forth. (33, 35, 37)

The Philosophy of Support Price Programs in Venezuela

The support price programs in Venezuela have been surrounded by many beliefs and values, but clear and measurable goals have not been published. It is necessary to examine the annual reports of the Ministry of Agriculture and its agency the Agricultural and Livestock Bank (B. A. P.), which was charged with the responsibility of executing the program, to determine the underlying philosophy or objectives to be served.

Forgetting the coffee and cocoa experience of 1938 and 1942 and the haphazard and scattered support programs of the 1940s and 1951

\(^5\) Beginning in 1967 this price was raised to Bs. 1.25/Kg. in order to encourage increases in production.
consideration will be given throughout this thesis to the basic and widespread support price programs beginning in 1959. The policy of the late 1950s, it was said, had the objectives of guaranteeing a fair profit and a sure market for the supported agricultural commodities (35). However, what was meant by "fair profit" was not defined, although it is clear the reference to the "sure market" refers to the B.A.P. as a primary outlet.

Another purpose of price support that was voiced was to avoid low prices for the protected commodities during the time of harvest, and thus production would increase even more (28). This conclusion was the result of the observation that the farm support prices were always over the market prices during the period of harvest.

Another expressed point of view was to limit the application of the support price to those who had obtained credit to enable the B.A.P. to collect the loans it had extended and to leave the self-financed producers to go to the market to bargain for prices. But when in 1962 agricultural surpluses were produced in corn, potatoes and eggs, this point of view was not acceptable. All producers asked for protection for the mentioned commodities and a broad magnitude of the support price program was realized by the government for the first time (36).

It has been said earlier that the supported products are purchased on the basis of quality; i.e., standard grades. It was
stated by the policymakers that support prices should change according to production and that the stated changes should be announced in advance of planting. This means that if the production of a particular commodity increased over domestic consumption, leaving a surplus in the market, the support price scale should be decreased before the preparation of land for the next crop in order to discourage production of those crops in large supply. (29)

Another belief has been that support prices based on standard grades would influence the rate of yield per hectare because prices by themselves are incentives to bring better practices and technology to the sector. (28)

The most recent statement about the involved values in the program are expressed by the Agricultural and Livestock Bank "B. A. P." in the following way: The purpose of the support price program is to give stability and to increase producers' income (31).

A Summary of the Problems

To understand better the problems that surround the developing agricultural economy of Venezuela, it is necessary to compare a developing country with characteristics of a developed one. When this is done, several problems in the structure of the Venezuelan economy emerge. The different sectors of the Venezuelan economy are discussed in another part of the thesis, but
as was said earlier, the total population is made up by a large proportion of rural people. If one goes back to the late 1950s, he will find high pressure from these people for better living conditions. Support price programs were initiated to complement other tools that were created to provide economic growth to the agricultural sector with the expectation that such growth would be beneficial in improving rural living. Perhaps the multipurpose nature of the price support program, as has been seen in a former section, may explain why it has become a source of trouble to the government, especially to the agencies in charge of its administration. Conscious of these problems that have arisen with the program and with the prospects that they are going to be more numerous and serious in the future, agencies of the government that in one way or another are closely related to the performance of the agricultural sector, have been seeking a formula that in the short or intermediate term, would solve its most urgent problems. Such solution has to take into account that it is of national interest to maintain the rapid growth of agriculture and improve the economic conditions of the rural population.

We can summarize the principal problems related to the support program in Venezuela with the following points, leaving for further analysis the details of each:
1. Looking at a time series of production and yields for supported commodities, it can be observed that changes in production and productivity have not followed the same pattern for all of them. Some commodities have shown an increase in production but not in productivity; others have shown decrease in production or have increased in both production and productivity. If a lot of money is spent every year in the form of support prices, what is wrong with the program and/or those commodities that have not increased in production or productivity?

2. Because surpluses of rice have been occurring since 1963 and the government expects similar situations in the intermediate run with corn and potatoes, among the supported commodities, it has manipulated several tools (as change of the official credit budget for individual commodities, changes in the level of support prices, changes in the rules of purchases, etc.) to try to shift upward the supply curve of the supported commodities. However, the objective has not been achieved because of the opposition of the organized farmers to accept modifications that may hurt the credit budget or the condition under which any of the supported commodities are purchased by the government.

3. The rice surplus has been increasing year after year despite exportation during the period 1964-67. The problem to solve is how to increase the utilization of rice domestically and
possibly reduce government costs.

4. Another problem faced by the government due to surplus, is shortage of storage for agricultural commodities.

5. Another consequence of the surplus problem is the shortage of credit for the development of production of other commodities.

6. Exportation of surplus rice has been effected at a loss for the government in an amount in excess of 60% of the original cost of the rice (30). The same problem of high internal costs and low prices in the international market is found in almost all the other supported commodities.

7. There is government reluctance to enhance the program with other commodities because of the problems it has with rice today.

Purpose of Thesis

The main objectives of this thesis can be summarized as:

1. To test the general hypothesis that the support price program in Venezuela was the primary instrument in achieving self-sufficiency in the production of the most important supported agricultural commodities and in pushing ahead the development of the agricultural sector.

2. To test a secondary two-fold hypothesis:
a) That the surplus of production in some of the supported commodities may become a serious bottleneck of the subsequent growth of the agricultural sector.

b) That many of the basic problems arising from the price support program result from the absence of clear policies and goals to guide it.

3. To examine and evaluate possibilities of reallocation of resources used in the production of surplus agricultural commodities in order to get a higher return for the economy as a whole.

4. To examine and evaluate possible alternatives, if any, for the disposition of the accumulated surplus and those that may arise in the intermediate run. Emphasis will be given to

   a) Possibilities of increasing the domestic market.

   b) Possibilities of selling the surpluses in the international market.

Methodology and Source of Data

The general hypothesis will be tested through the analysis of the performance of the agricultural sector in Venezuela in the last several years. The period of study will be 1948-1967 but emphasizing production during the period 1960-1967 and the variables that might have influenced it. Chief among these variables are: number of hectares harvested, amount of official credit paid to
farmers, technological changes and support prices.

The sound method to analyze this data seems to be by multiple regression. Because in general the support price program for the six products to be treated began in Venezuela between 1959 and 1961 and the supports have been almost constant until 1967, it is possible to analyze its effect on production, assuming a value zero for the period 1948-58 which is the period prior to support prices, and a value of one for the period 1959-1967, in the case of rice, a value of one in the case of corn, black beans and sisal for the period 1960-1967, and a value of one in the case of potatoes and cotton for the period 1961-1967. However, it is necessary to check the variation by commodities between the period with support price and the period without support price and the variations observed in the results when the value "one" is replaced by the actual support price. The procedure in which support price is made zero and one permits one to measure the importance of the program as a means of guaranteeing price. When support price takes its real values, one gets the effect of a given level of prices on production.

The degree of importance in being self-sufficient in the agricultural commodities favored with price support will be determined by the amount of foreign exchange saved by domestic
production and the contribution by this production to the agricultural gross product.

To complete the test of the general hypothesis it is necessary to utilize times series in order to see if the support price for the selected commodities changed the trend of production. It is necessary also to analyze the other sectors of the economy and compare them with agriculture, paying special attention to their contribution to the G.N.P. variation in their rate of growth, capital invested in each sector, etc.

The secondary hypothesis is tested in the following way: for part (a) data on storage, insurance and administration costs will be analyzed. The price at which surpluses have been sold, allocation of resources and the trend of the demand for credits also will be studied. These data will be compared with the B.A.P. resources and the government contribution to the loan programs to see if there is any risk of a complete stagnation of the agricultural sector. For part (b) it is necessary to check the purposes that have or have not been achieved with the price support program. Purposes will be examined, because as has been indicated, this program does not seem to have measurable goals. The problems will be also examined and related to the uncleanness of the definition that through time have been used in an attempt to justify the program.
The third objective may be tested by determining what factors have influenced the production of each supported commodity most and by comparing the costs and returns for each commodity determine where such factors would return higher profits than those they return today under the prevailing circumstances. Consideration will not be given to the allocation of resources outside of agriculture, because Venezuela needs to develop other agricultural commodities to replace present importations. Because the culture of these commodities presently lacks modern technology, the country needs to build more dams and wells, produce more fertilizers and use them, to see if the use of more tractors and other machinery is economically feasible. In addition, and which is more important, there is need to increase the standard of living of "campesinos".

The fourth objective may be met through an analysis of prices abroad, the price elasticity of the domestic demand, and the demand in secondary markets. The possibility of increasing the domestic market will be analyzed by:

a) Using the price elasticity of the supported commodities, determine if consumption is restricted by high prices to consumers or if there are other reasons that have limited the market, and

b) Look for possibilities to diversify the uses of the commodities.

The data used are mainly from secondary sources. Some of them are contained in Venezuelan periodicals from the government
and private sources. Others come from international organization publications such as the United Nations and also publications of the U. S. Department of Agriculture. Finally, information from personal files and correspondence with personnel in various governmental agencies is used to detail such items as government costs of storage, maintenance, exportation losses, credit available to farmers, etc.

Limitations of the Thesis

Because Venezuela is a developing country its statistics are also developing and some data are not available, or are available only for recent years. This is perhaps the greatest limitation that is faced in this thesis and it affects directly the calculations made in the next section. Another limitation is faced in the analysis of productivity. This is because commercial farms are thought to have higher yields per hectare than "campesinos" farms. Therefore, it would be desirable to use two variables for productivity, but yield data for these two groups is not carried separately in Venezuela. The yield data used is a national average and by itself does not say what the performance has been for each group. A better treatment of technological change might be given by considering it a function of annual investment in machinery, fertilizers, insecticides, other chemicals and credit, and assemble
the results into a general production function which would be made a function of prices received by farmers, acreage harvested and time. But to get these data is impossible because the use of inputs by crops has never been separated in Venezuela.
CHAPTER II

THE AGRICULTURAL SECTOR IN VENEZUELA

The Agricultural Gross Product

The analysis of this sector in Venezuela has followed the criterion of dividing it into three sub-sectors: Vegetable, animal and forestry. The vegetable sub-sector includes all the commercial crops produced in Venezuela during one year. The animal sub-sector includes the milk produced for the market, the carcasses of broilers and livestock, eggs and fishery products. The forestry sub-sector includes the wood produced and other wood and by-products.

All the supported commodities belong to the vegetable sub-sector, although the other sub-sectors, especially animal, have been protected by the government through subsidies. For this reason this chapter will pay more detailed attention to the vegetable sub-sector.

The latter sub-sector mentioned has been divided in the following groups: Cereals; legume grains; roots; oil seeds, fats and fibers; fruits and other vegetables; and other commodities.

The Venezuelan agricultural gross product for 1967 at 1957 prices was estimated to be Bs.2.67 billion. This figure represents
an increase of approximately 6.5% in relation to the product for 1966, as depicted in Table 1. Also shown in Table 1 is the fact that the vegetable sub-sector is the most important one in terms of its contribution to the agricultural gross product. Its contribution in 1967 was 57.2% of the total. Noticeable increase is shown by the cereal group whose value increased 22.3% in relation to 1966. However, this value increase was the result of large production but not increase in prices. Even if its value is calculated at current prices instead of 1957 ones, the result would indicate the same; the increase in the value of production did not result from increasing prices. This suggests that the farmers' share, other things being equal, might have stayed unchanged. However, larger yields and/or reduction in unit costs might have favorably affected the farmer's economic position.

The gross product increased during 1967 by 84.37% in relation to 1957, with the increase of the groups cattle and poultry; cereals and oilseeds, fats and fiber being most noticeable. Although the agricultural gross product in general terms has increased during the period 1957-1967, not all the commodities have maintained their weight in this participation in the formation of the gross product. For example, corn, black beans, yam, potatoes and cassava decreased their participation in the value of production. The vegetable sub-sector as a whole also showed decline in its participation; however it is the most important in money terms and in labor absorption. The animal sub-sector increased its value of production within the period 1957-67 although if the group fisheries is taken into account, the increase between 1966 and
### Table 1: The Agricultural Gross Product of Venezuela, by Commodities at 1957 Prices

In million of bolivares

Ratio of exchange: Bs.4.50 = $1.00

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Gross product</th>
<th>Indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cereals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>10.03</td>
<td>.69</td>
</tr>
<tr>
<td>Corn</td>
<td>71.76</td>
<td>4.95</td>
</tr>
<tr>
<td>Wheat</td>
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<td>.07</td>
</tr>
<tr>
<td><strong>Legume</strong></td>
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<td></td>
</tr>
<tr>
<td>Green peas</td>
<td>1.73</td>
<td>.12</td>
</tr>
<tr>
<td>Black beans</td>
<td>32.88</td>
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</tr>
<tr>
<td>Kidney beans</td>
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<td>1.23</td>
</tr>
<tr>
<td>Chick peas</td>
<td>6.71</td>
<td>.46</td>
</tr>
<tr>
<td><strong>Roots</strong></td>
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<td></td>
</tr>
<tr>
<td>Celery</td>
<td>4.24</td>
<td>.29</td>
</tr>
<tr>
<td>Sweet potatoes</td>
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<td>.31</td>
</tr>
<tr>
<td>Mapuey</td>
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<td>.34</td>
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<tr>
<td>Yam</td>
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<td>Cassava</td>
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<tr>
<td>Potatoes</td>
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Continued
### Table 1. The Agricultural Gross Product of Venezuela, by Commodities, at 1957 Prices—Continued

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Table 1. The Agricultural Gross Product of Venezuela, by Commodities, at 1957 Prices--Continued

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<td>0.13</td>
<td>0.02</td>
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<td>0.00</td>
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<td>6</td>
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<td>2,509.30</td>
<td>100.00</td>
<td>2,673.62</td>
<td>100.00</td>
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<td>184</td>
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1967 will be less important because this group has decreased in the sector. Forestry also declined its participation in the agricultural product formation varying from 4.79% in 1957 to 3.81% in 1967.

The supported commodities (rice, corn, black beans, potatoes, cotton and sisal) contributed in 1957 Bs. 177.5 million equivalent to 12.9% of the total. In 1965 their participation was Bs. 350.1 million or 13.9% of the total and for 1967 Bs. 405.1 million; i.e., 15.1% which evidences increasing relative importance of these commodities in recent years, even considering the negative weight of black beans in the group. An important phenomena observed in 1967 is that, for the first time, rice overcame corn as the principal contributor of the cereal group.

The sub-sector that has achieved the highest increase in the product formation during the period has been "animal", although in 1967 it was observed that "vegetables" was higher than "animals". The gross product of the animal sub-sector, excluding fishery, at 1957 prices, was calculated for 1950 to be Bs. 307.0 million; i.e., an index of 77.3. For 1967 the estimation was Bs. 979 million or an index of 246.6 which means an increase of 169.3 points. The sub-sector "vegetables" varied from Bs. 664.0 million; i.e., an index of 70.7, to Bs. 1,531.0 million during 1967 or an index of 163.0 which means an increase of 92.3 points (37, p. 23). If fishery is considered an independent sub-sector, it can be noticed that it has failed in acquiring an important place in the agricultural gross product. Its participation was Bs. 34.0 million in 1950 against Bs. 66.0 million in 1967; i.e., its index changed from 34 to 66, an increase of only 32 points in 17 years. The total agricultural
sector produced commodities for a value of Bs. 1,057.0 million in 1950. Comparing this figure with 1967, a variation in the index from 72.9 to 184.7 or an increase of 111.8 points is observed. All values are on the basis of 1957 prices.

Table 2 shows that the agricultural production grew 4.8% annually between 1950-1957 but its rate of growth between 1957-1967 was 6.3% annually. Taking shorter periods after 1957 it is observed that the annual growth rate increased, which might mean that new technological changes or more education has been brought into agriculture in recent years.

Table 2. Annual Growth Rates of the Agricultural Sector of Venezuela

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<td>Vegetable</td>
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<td>5.0</td>
<td>5.4</td>
<td>6.8</td>
<td>7.3</td>
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<tr>
<td>Animal</td>
<td>4.7</td>
<td>7.0</td>
<td>7.9</td>
<td>8.3</td>
<td>6.3</td>
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<td>Fish</td>
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<td>3.8</td>
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<td>5.6</td>
<td>4.2</td>
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<tr>
<td>Forestry</td>
<td>4.0</td>
<td>4.0</td>
<td>3.0</td>
<td>8.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>4.8</td>
<td>6.3</td>
<td>6.2</td>
<td>7.4</td>
<td>6.7</td>
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</table>


The gross agricultural product of the Venezuelan "campesinos" has been estimated (37) in 1967 to be Bs. 600 million approximately. This means that commercial farmers produced Bs. 2,073.6 million of agricultural commodities during the same year, a figure that is equivalent to 78% of the total agricultural gross product. The "campesinos" participation, although substantially increased since 1960 when the agrarian reform started, and when their contribution to the product was estimated as Bs. 80.0 million approximately, is still not very significant (22.0%) in terms of the population employed in the sector.
Unfortunately it is difficult to separate clearly the boundaries between "campesinos" and small commercial farmers, because these terms have not been differentiated by the agricultural census. Nevertheless, it is known that for 1961 there were 778,000 people employed in the agricultural sector working on 254,400 farms less than 20 hectares in size and on 60,700 farms with 20 or more hectares. All these latter 60,700 farms can be considered commercial farms.

The former figures give at least an idea of the large number of people that produce the "campesino" gross product. The "campesinos" produced approximately 4.63% of the agricultural gross product in 1960 and 22% in 1967. Although the increase is a noticeable one it does not alter the fact of capital concentration in the hands of relatively few farmers who produce more than three-fourths of the total product of the sector.

The interest that the public investment has put in the Venezuela agricultural growth can be observed by its high annual rate of growth and in the goal of production the Central Planning Office of the Venezuela government set upon a three-year plan in 1965. That office had as a goal to be achieved by the agricultural sector a gross product of Bs. 2.59 billion in 1966 and Bs. 2.82 billion in 1967, (40, p. 16).

The explanation that the government has given about the emphasis put on agriculture, has been the necessity found in 1959 to reduce the importation of commodities easily produced in the country. It also said that the second goal, after production goals
were fulfilled, would be to increase productivity.

Production, Area Harvested and Yield

In order to narrow the field of this sub-title, the following will concern a rapid view of the sector, leaving for later the details of the analysis of the price-supported commodities.

Within the distribution of production among the different agricultural commodities presented as relevant characteristics within the period 1960-1967, a noticeable increase in the production of cereals is observed. The tonnage varied from 512,148 tons produced in 1960 to 898,100 tons in 1967. In this group, while the increase of production of corn within the period was only 164,847 tons, rice went up from 71,860 tons in 1960 to 292,248 tons in 1967, an increase of 220,386 tons. The increase shown by the group "other commodities" was due almost entirely to sugar cane which increased production almost twice within the period 1960-1967. The group "Legume" decreased its tonnage as black beans fell to its lowest level of production in 1962. (Table 3.)

If it is true that production in general terms has increased, it is also true that area harvested increased. It is therefore necessary to analyze carefully these two variables to see the effect of yield.

As in the case of tonnage produced, it is observed that the

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<td>tons</td>
<td>hectares</td>
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<td>63,678</td>
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<td>1</td>
<td>83,392</td>
<td>138,749 b</td>
<td>601</td>
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<td>143,374 b</td>
<td>654</td>
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<td>2</td>
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<td>792</td>
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<td>3</td>
<td>129,154</td>
<td>168,953 b</td>
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<td>9</td>
<td>135,559</td>
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<td>9</td>
<td>158,823</td>
<td>221,777</td>
<td>716</td>
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</table>

3.

p. 7.
groups that increased most in area devoted to crop production during the period 1960-1967 were cereals which increased 198,317 hectares; oilseed, fats and fibers which increased 98,016 hectares and "Other commodities" that increased area by 71,908 hectares. The commodities that have accounted for most of this increase in land uses have been: rice, which shows an increase of 97,019 hectares; corn which increased 90,318 hectares; sesame which increased 88,495 hectares, and plantain which increased 43,113 hectares within the same period. On the other hand, land area used by the group "Legumes" decreased by 37,750 hectares. The land area devoted to the group "Roots" also decreased by 2,370 hectares, but contrary to the "Legume" group, "Roots" increased production so its productivity as a whole increased.

Because the analysis of each one of the commodities that form the agricultural sector would involve a field for a thesis, it is considered a better procedure to analyze individually the six supported commodities. This analysis will include production, area harvested, yield and the performance of each within the sector as a whole.

**Rice:** Analyzing production data between 1948-1967, it can be seen that rice has increased in production by 601%. This is not the result of a constant increase in production since 1948 however. On the contrary, the series presents sharp variations until 1959,
when an impressive increase in production was started. This is reflected in Table 4 and as index numbers in Figure 1. Part of the variations have their explanation in isolated programs to increase production but later abandoned, as occurred in 1954; or in diseases as was the case in the period 1956-58, or in special integrated programs as was the case in 1959-67.

With the purpose to increase production, a continuous rice credit program was started by the B.A.P. in 1959. On the other hand, rice was also included in the support price program in the same year. The support price was set at Bs. .60/Kg. ($1.13) depending upon percent moisture, foreign materials, damaged kernels, etc. In 1966 requirements were applied to length of kernel with the purpose to produce better quality and prices for the rice to be exported. Nevertheless, the support on the rice produced by "campesinos" did not vary for moisture content nor with transportation costs.

The area seeded to rice and harvested has also experienced sharp variations during the analyzed period for the same reason as the production variations. The increase in 1967 in relation to 1948 was 327%. The rice yield, which presented a general growth since 1959 is still below the yield achieved by many countries in South America.

1960-61=100

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<th>Area harvest, Hectares</th>
<th>Area harvest Index</th>
<th>Yield Tons</th>
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<td>1949</td>
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Source: Table 3.
Figure 1. Index Numbers of Production, Area Harvested and Yield of Rice in Venezuela, 1948-1967.

1960-61 = 100

Index

Production ---
Area harvested --
Productivity (yield) ---

Years
Among other things, in Venezuela, yield is a resultant average of two different kinds of farmers: commercial farmers, usually with more resources and educational background and "campesinos" who generally are tied to traditional practices of land culture.

Because of the program initiated in 1959, rice culture spread throughout the country, even in marginal areas. This lack of appropriate location has contributed to low productivity, especially among the "campesinos" group. While some states of the country—Guárico, Cojedes and Portuguesa—have average yield of 3,005 Kg./He., 2,176 Kg./He. and 2,163 Kg./He., respectively, others such as Yaracuy, Auzoategui and Carabobo—have average yields below 1,000 Kg./He. During the dry season, when irrigation is necessary, the lowest yield among commercial farmers for some states was: 1,955 Kg./He. in Trujillo, 1,373 Kg./He. in Falcon and 2,033 Kg./He. in Cojedes. If it is estimated (3, p. 48) that the average direct cost of production per hectare \( ^6/ \) is Bs. 1,029.0 \( ^7/ \) it can be seen that it is necessary to produce at least Kgs. 1,715 of the highest standard grade of rice in order to cover such costs.

---

\( ^6/ \) Considered as direct costs are: the rental of machinery, the cost of improved seed, fertilizers, chemicals and the labor cost but without consideration of the labor management return.

\( ^7/ \) It is estimated that using irrigation the direct cost by hectare is Bs. 1,434.0, but without irrigation, i.e., taken advantage of the rainy season, the direct cost decreases to Bs. 625.0 per hectare.
That is, a yield of 1,715 Kgs. should be the minimum quantity a farmer should get in a bad year, assuming he incurs neither transportation nor packing costs. A producer would be forced out of business if low yields were reported constantly. When he covers direct costs, he is not allowing any amount for land charge; i.e., a percentage of the current average cropland value, machinery depreciation and obsolescence, interest on operating capital used during the current year, interest on machinery and equipment, etc. Neither is he receiving any amount for his job as manager of the farm.

The former cost analysis shows that many rice growers, even commercial ones, are not receiving returns for all their investment in their farms. Commercial farmers, those that use irrigation, must have a yield of at least 2,390 Kgs. of the highest standard grade of rice to cover such direct costs, but it was not always the case, as has been shown.

In many parts of the country commercial farms are up to date in technology, especially based on experience taken from the U. S. rice growers. Some figures will illustrate this situation. During the dry season of 1964, from 276 rice farms reporting, 270 used chemicals, 256 used fertilizers, 250 used herbicides, 271 used irrigation and had their farms mechanized. For the 1963 rain-season crop, when the majority of the growers are "campesinos"
especially those who are not living in a settlement with irrigation systems, the result was the other way around. Out of 7,335 reported farms that cultivated rice, only 1,859 used chemicals, only 252 used fertilizers, 971 used herbicides, 350 used irrigation and only 1,811 used machinery (33, p. 22-25). Although between 1963 and 1967, "campesinos" received more than 1,000 pieces of machinery, furnished by a cooperative established by their federation, and other equipment furnished by the B.A.P., the lack of technology has not changed substantially. The new equipment has been distributed to be used in different regions and on different crops.

It may be stated that the difference in yield between the dry season and the rainy season crops is determined by the use of marginal lands, poor technology and poor management during the rainy season. This statement does not imply, however, that during the dry season the management factor is a perfect one; it only implies that it is on the average much better than that used during the rainy season crop. Commercial farmers are the ones who receive the higher yields and it is because they are specialized through approximately 10 years of experience in the same crop, have received full credit aid from the B.A.P. and have a better know-how generally than the average farmer working during the less productive season. The rice production in Venezuela has been
financed by the Agricultural and Livestock Bank "B.A.P. to the extent of approximately 50% of the total since 1960, and due to the execution of the support price program buys approximately 80% of the total production.

**Corn:** Analyzing corn production from 1948 to 1967, as was done with rice, it can be seen that corn production in Venezuela has increased 179% during the period. Contrary to what has happened with rice, corn production did not show sharp variations during the analyzed series, although it cannot said either that a stable rate of increase occurred as can be seen in Table 5 and Figure 2. Perhaps the most impressive change in production in the last years occurred between 1962 and 1963 when production fell 110,000 tons. This was a consequence of the interruption of a special credit program due to the lack of loan funds.

The production of corn has been the subject of very special interest by the government because it has been the crop "campesinos" have sown with some excellence and because it is the raw material for a typical bread always present in the Venezuela diet. This reason of being a basic commodity has justified in the minds of many the large volume of credit extended for its production and its presence in the support price program. A support price was first established according to area of production, taking into consideration primarily the cost of transportation from the farm to the
1960-61=100

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<th>Years</th>
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<th>Production Index</th>
<th>Area Harvest Hectares</th>
<th>Area Harvest Index</th>
<th>Yield Tons</th>
<th>Yield Index</th>
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</table>

* Estimated figures.

Source: Table 3.
Figure 2. Index Numbers of Production, Area Harvested and Yield of Corn in Venezuela, 1948-1967.

1960-61 = 100
closest warehouse of the B.A.P. In 1964 the support price was made a uniform one in all parts of the country at Bs. .40/Kg. ($0.088). As with rice, "campesinos" neither pay the costs of processing to reduce its moisture nor the transportation from the area of production to the closest public warehouse.

The corn area harvested in Venezuela increased by approximately 147% between 1948 and 1967 which means corn acreage increased almost at the same rate as production.

Based on changes in production and area harvested, only a very small change in corn yield can be expected. Data show corn yield increased 9% over the entire period of 20 years but with considerable year-to-year fluctuations. This indicates the astonishingly poor productivity of this commodity which may be partially explained by: 1) Corn has been primarily a "campesino" grown commodity. Commercial farmers specialized in coffee and cocoa plantation around the 1930s and 1940s and public attention was not given to the "campesinos" and this commodity. Technological advances ignored the culture of corn. It may be said that corn still represents the traditional agriculture of Venezuela. 2) No specialized zones of production based on soil classifications adapted to corn growing have been established. On the contrary, corn is produced throughout the entire country regardless of soils, location or topography. The effect of this situation is evidenced
through the average yield in the various states of the country. For 1967 the lowest yield per hectare was located in the Federal District with 404 Kg./He., the highest one was located in Portuguesa with 1,788 Kg./He. This means that if its direct cost of production, calculated as in the case of rice, is estimated at an average of Bs. 499.0/He. and the price is equal to the support price for the best grade of corn, it is seen that in order to cover such a cost it is necessary to produce at least approximately 1,225 Kgs./He. under the same assumption made for rice. During 1967 seven states out of 19 that produce corn, plus two territories and the Federal District had yields below 1,000 Kg./He. Only four states had yield equal to or over the calculated minimum. 3) From causes (1) and (2) a third one may be inferred; i.e., lack of management on both commercial and "campesinos" farms.

Corn is and has been the leading agricultural commodity in credit received from the B.A.P., which has financed approximately 30% of the total area harvested during all of the period 1960-1967. But it only receives an average of approximately 20% of the total production as executor of the support price program.

Black Beans: Because of lack of accurate information for longer periods, the series chosen to analyze this commodity was 1952-67.
Contrary to the cereals analyzed, this commodity suffered decreases in production during the period. Although its reduction between 1952 and 1967 is only 6.6%, production declined sharply for a few years after 1960. Its lowest production was in 1962 (23,030 tons) which represented a reduction of 32% in relation to 1952 and a 54% reduction from the peak of 1960. While production has increased gradually from the low point, it has not reached earlier levels.

This commodity is also considered to be a basic one in the Venezuelan diet, especially for poor and middle class people. Efforts made to increase its production on a consistent basis have failed. Among these efforts is its inclusion in the support price program in 1960 and a further increase in the level of support from Bs. 1.0 Kg. to Bs. 1.25 Kg. ($.27). In addition, direct and associated credit programs were established, the first one to the exclusive production of this legume, the second one to be used to sow black beans together with an associated crop, especially corn or cotton. Another recent measure has been to encourage the production of improved seeds.

The area harvested has also varied during the period, but it has increased for 1967 in comparison to 1952 by 17.5%. This shows that increase in production was also reached through expansion of the area seeded, as is depicted in Table 6 and Figure 3, but
1960-61=100

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* Estimated figures

Source: Table 3.
Figure 3. Index Number of Production, Area Harvested and Yield of Black Beans in Venezuela, 1952-1967. 1960-61 = 100.
no positive results have been achieved. On the contrary, the move-
ments in the wrong direction of production and area harvested
through different years in the period analyzed show the same nega-
tive pattern as yield per hectare. It can be seen that the yield
varied from 877 Kg./He. in 1958 to 441 Kg./He. in 1967 which
meant a reduction of 49.7%.

The low yield of this legume might be explained by technolo-
gical difficulties in its culture. First of all, it has been found that
the seeds used do not have high genetic productivity even under
ideal conditions and; second, the varieties used grow up wound in
the trunk of other plants as corn and cotton, thus making mechan-
ized harvesting impossible. As a result, harvesting is done by
hand which is very time consuming and unacceptable to farmers
with better alternatives.

The yield varied during 1967 by states from 296 Kg./He. in
Yaracuy to 552 Kg./He. in Lara. Its direct costs of production
have been estimated at Bs. 434.0/He., so if the selling price for
the highest standard graded black beans is assumed to be the
support price of Bs. 1.25/Kg., direct costs will be covered
with production of at least 346.4 Kg./He. During 1967 only one
state had an average yield below such figure. This seems to
indicate that the support price generally should be high enough to
attract farmers into the production of this legume. However, this
movement has not occurred.

**Potatoes:** Analyzing the potato enterprise from 1948 to 1967 it can be observed that Venezuela's potato production showed a very large increase (844%) between 1948 and 1967 (Table 7 and Figure 4). The production of this root increased almost constantly except for four single years during the 20 years analyzed. The total figure is the combination of two different varieties—the red and the white potatoes, which are harvested in three different periods during the year.

The area harvested also increased during the period but in a less significant proportion. The 1967 area was 147.5% greater than the 1948 figures. Area also presented an almost continuous increase but at a lower ratio than production. An exception was 1961 when the area declined to a half of that of the former year.

Because the production of this commodity has increased at a much faster rate than area harvested, an increase in crop yield must be responsible. The figures show a 281.4% increase in yield during the period which is an indication of the application of technological changes. While yields have increased, they are still below the average yield in the U. S. or Europe but higher than the average in South America.

The yields by states varied in Venezuela from 6,839 Kg./He. to 14,929 Kg./He. during 1967. Direct cost of potato production
1960-61=100

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<th>Production</th>
<th>Area harvest,</th>
<th>Area harvest</th>
<th>Yield</th>
<th>Yield</th>
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<td>Hectares</td>
<td>Index</td>
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<td>1958</td>
<td>69,774</td>
<td>67.2</td>
<td>10,110</td>
<td>73.5</td>
<td>6,901</td>
<td>90.3</td>
</tr>
<tr>
<td>1959</td>
<td>93,128</td>
<td>89.7</td>
<td>14,492</td>
<td>105.4</td>
<td>6,426</td>
<td>84.1</td>
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<tr>
<td>1960</td>
<td>133,594</td>
<td>128.7</td>
<td>18,182</td>
<td>132.2</td>
<td>7,348</td>
<td>96.2</td>
</tr>
<tr>
<td>1961</td>
<td>73,977</td>
<td>71.3</td>
<td>9,323</td>
<td>67.8</td>
<td>7,935</td>
<td>103.8</td>
</tr>
<tr>
<td>1962</td>
<td>121,203</td>
<td>116.8</td>
<td>15,982</td>
<td>116.2</td>
<td>7,584</td>
<td>99.2</td>
</tr>
<tr>
<td>1963</td>
<td>110,919</td>
<td>106.9</td>
<td>14,693</td>
<td>106.8</td>
<td>7,549</td>
<td>98.8</td>
</tr>
<tr>
<td>1964</td>
<td>123,536</td>
<td>119.0</td>
<td>14,892</td>
<td>108.3</td>
<td>8,295</td>
<td>108.6</td>
</tr>
<tr>
<td>1965</td>
<td>135,890</td>
<td>130.9</td>
<td>16,172</td>
<td>117.6</td>
<td>8,403</td>
<td>110.0</td>
</tr>
<tr>
<td>1966</td>
<td>142,700</td>
<td>137.5</td>
<td>16,495</td>
<td>119.9</td>
<td>8,651</td>
<td>113.2</td>
</tr>
<tr>
<td>1967</td>
<td>151,040</td>
<td>145.5</td>
<td>17,331</td>
<td>126.0</td>
<td>8,715</td>
<td>114.0</td>
</tr>
</tbody>
</table>

* Estimated figures

Source: Table 3.
Figure 4. Index of Production, Area Harvested and Yield of Potatoes in Venezuela, 1948-1967. 1960-61 = 100

Index

Production
Area harvested
Yield

Years

using irrigation is estimated to be Bs. 2,237.0/He., so if it is assumed that the price at the producer level is equal to support price for 1967; i.e., Bs. .35/Kg. ($.077 Kg.) it is found that a farmer should produce at least 6,391 Kg./He in order to cover such direct costs of production. As was seen in Table 7 Venezuela had an average yield in 1967 of 8,715 Kg./He. which means that on the average potato growers are covering direct costs entirely and have an excess to apply to fixed costs and labor management returns. In general for 1967 no single state had yields below the requirement to cover direct potato production costs under irrigation. It is assumed that cost of production when irrigation is not used; i.e., during the rainy season, are less than the figure for irrigated crops, so the yield to cover the direct costs should also be lower than 6,391 Kg./He. During the rainy season crop of 1967 yield varied, considering the producer states, from 6,509 Kg./He. to 9,246 Kg./He. with an average of 8,514 Kg./He. The yields during the dry season crop varied from 5,963 Kg./He. to 14,928 Kg./He. with an average of 9,300 Kg./He. Only one state was below the minimum required to cover direct costs. The third crop referred to as "of the north" and harvested at the end of the year has slightly lower average yields than the rainy season crop, but the difference is not significant. Data for this crop for 1967 were not available but in 1965 the average yield was found to be 7,784
Kg./He. If the direct costs and prices were the same in 1965 only two states with the north crop produced less than the amount considered minimum for irrigated crops (33).

For 1963 during the dry season crop there were 1,236 farms growing potatoes with a total area planted of 6,084 hectares. Of these 1,236 farms, 1,024 used fertilizers, 111 used herbicides, 1,072 used insecticides, 1,077 used fungicides, 1,109 used irrigation and 493 used machinery. During the rainy season crop there were 1,549 farms growing potatoes with a total area planted of 8,112 hectares. Of these 1,549 farms, 1,221 used fertilizers, 154 used herbicides, 1,404 used insecticides, 1,197 used fungicides, 201 used irrigation and 898 used machinery (33, p. 123-5).

As can be seen from the foregoing, potatoes seems to be one of the commodities, among the protected ones, that use on the average more technology. Therefore, it should be expected that a high correlation exists between this factor and production.

Cotton: The analysis of the cotton enterprise also covers the period 1948-1967. Its production showed an increase of 572% within the analyzed period. This production is characterized by an almost constant increase throughout the years, interrupted only in 1953, 1956 and 1962.

The area harvested increased approximately 386% between 1948 and 1967. The area sown to cotton showed a constant increase
from 1948 to 1960 interrupted only in 1953. All the variations within the period can be observed in Table 8 and Figure 5.

This associated movement between production and area shows the role of yield. In effect, yield has increased only 38% between 1948 and 1967. This is a very low rate of productivity change.

Figures in Table 8 show that the area harvested explained the increase in production during the period 1948-1962, but after 1962 the area has shown a trend to increase less than production and in some cases to decrease as it did in 1964. This might be the result of recent technological changes introduced in the cotton culture.

Figure 5 which depicts the indexes of Table 8 was prepared with the same base as the other supported commodities, with the purpose of keeping uniformity in the analysis. However, it is clear that the base 1960-61 is not a good one in this case, because 1960 was the year with the lowest production per hectare in the period.

The average yield of cotton was 964 Kg./He. in 1967, the direct costs of production were estimated at Bs. 877.0/He. for those varieties that produced short and medium fiber. If it is assumed that the price at the farm level was the average support price for the different standard grades of cotton; i.e., Bs. 1.25 kg., it can be seen that it was necessary to produce at least 702 Kg./He. in order to cover such direct costs of production.
Table 8. Changes in Cotton Production in Venezuela, 1948-67
1960-61=100

<table>
<thead>
<tr>
<th>Years</th>
<th>Production Tons</th>
<th>Production Index</th>
<th>Area harvest. Hectares</th>
<th>Area harvest. Yield Tons</th>
<th>Yield Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>7,118</td>
<td>21.6</td>
<td>*10,212</td>
<td>19.4</td>
<td>110.4</td>
</tr>
<tr>
<td>1949</td>
<td>7,740</td>
<td>23.4</td>
<td>*10,473</td>
<td>19.9</td>
<td>117.1</td>
</tr>
<tr>
<td>1950</td>
<td>8,301</td>
<td>25.1</td>
<td>*13,367</td>
<td>25.4</td>
<td>94.4</td>
</tr>
<tr>
<td>1951</td>
<td>13,320</td>
<td>40.4</td>
<td>*18,760</td>
<td>35.7</td>
<td>112.5</td>
</tr>
<tr>
<td>1952</td>
<td>14,239</td>
<td>43.1</td>
<td>*20,939</td>
<td>39.8</td>
<td>107.8</td>
</tr>
<tr>
<td>1953</td>
<td>12,775</td>
<td>38.7</td>
<td>16,345</td>
<td>31.1</td>
<td>123.9</td>
</tr>
<tr>
<td>1954</td>
<td>16,016</td>
<td>48.5</td>
<td>17,409</td>
<td>33.1</td>
<td>145.8</td>
</tr>
<tr>
<td>1955</td>
<td>13,000</td>
<td>39.4</td>
<td>17,000</td>
<td>32.3</td>
<td>121.2</td>
</tr>
<tr>
<td>1956</td>
<td>13,660</td>
<td>41.4</td>
<td>17,084</td>
<td>32.5</td>
<td>126.8</td>
</tr>
<tr>
<td>1957</td>
<td>14,154</td>
<td>42.8</td>
<td>21,166</td>
<td>40.2</td>
<td>106.0</td>
</tr>
<tr>
<td>1958</td>
<td>21,860</td>
<td>65.6</td>
<td>32,222</td>
<td>61.2</td>
<td>107.4</td>
</tr>
<tr>
<td>1959</td>
<td>24,626</td>
<td>74.6</td>
<td>43,649</td>
<td>82.9</td>
<td>89.4</td>
</tr>
<tr>
<td>1960</td>
<td>29,639</td>
<td>89.8</td>
<td>54,940</td>
<td>104.4</td>
<td>85.4</td>
</tr>
<tr>
<td>1961</td>
<td>36,380</td>
<td>110.2</td>
<td>50,302</td>
<td>95.6</td>
<td>114.6</td>
</tr>
<tr>
<td>1962</td>
<td>24,242</td>
<td>73.4</td>
<td>37,449</td>
<td>71.2</td>
<td>102.5</td>
</tr>
<tr>
<td>1963</td>
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<td>104.3</td>
<td>47,491</td>
<td>90.3</td>
<td>114.9</td>
</tr>
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<td>1964</td>
<td>41,322</td>
<td>125.2</td>
<td>43,721</td>
<td>83.1</td>
<td>149.8</td>
</tr>
<tr>
<td>1965</td>
<td>44,600</td>
<td>135.1</td>
<td>45,919</td>
<td>87.3</td>
<td>153.9</td>
</tr>
<tr>
<td>1966</td>
<td>46,000</td>
<td>139.4</td>
<td>49,145</td>
<td>93.4</td>
<td>148.3</td>
</tr>
<tr>
<td>1967</td>
<td>47,840</td>
<td>144.9</td>
<td>49,627</td>
<td>94.3</td>
<td>152.8</td>
</tr>
</tbody>
</table>

* Estimated figures.

Source:
Figure 5. Index of Production, Area Harvested and Yield of Cotton in Venezuela, 1948-1967.  
1960-61 = 100
During 1967 all the states of the country had yields over that figure, varying between 807 Kg./He. and 1,269 Kg./He. Considering the two crops separately it is found that the average yield during the dry season was 1,159 Kg./He. whereas in the rainy season the average production was 929 Kg./He. All this means is that although the Veneuvelan average yield for this commodity is too low, the support price in the market is high enough to cover the direct costs of production and leave an amount to apply towards the fixed costs and labor management return.

Because long staple cotton is still imported by Venezuela, its domestic production has been the subject of special attention in the last years. To try to increase its production, the support price for this variety was increased in 1967. There is a price differential for these two varieties. The short and medium have the highest support price of Bs. 136.0, whereas the highest support price for the variety of cotton with long fiber is Bs. 200.0.

During the dry season crop of 1963, cotton was cultivated on 2,740 farms with a total of 10,748 hectares. This crop is grown every year along the flood plains of rivers after they have over-flowed during the rainy season. During the rainy season crop of 1963 there were reported 6,101 farms growing cotton.

Out of the 2,740 farms cultivating cotton during the dry season crop of 1963, only one used fertilizers, 1,169 used insecticides,
153 used fungicides, and three used machinery. But in 1964 in the same season crop, out of 3,065 farms, 212 used machinery. During the rainy season crop of 1963, out of 6,101 farms only 189 used fertilizers, 4,603 used insecticides, 7 used fungicides and 1,373 used machinery (33, p. 67). All these figures evidence a lack of technology and possibly a high incidence of plagues which contributed to the low yields found for this commodity.

Sisal: The period for which the production, area harvested and yield of this fiber is analyzed covers for identical reasons given for black beans the period 1952-1967.

The importance of this commodity in Venezuela's agriculture is more regional than national. Its production is settled in one single state where it gives employment to farmers of the region and laborers that process the fiber in making ropes and bags for agricultural products.

Sisal production during the period showed a positive increase of 118% by 1967 in relation to 1952. Nevertheless throughout this time production moved up and down, starting an ascendant phase in 1961 as depicted in Table 9 and Figure 6.

Area harvested during the period followed a close relationship with production; the area had sharp variations during the period 1952-1959 but started to increase constantly in 1960. Area harvested increased 61% in 1967 in relation to 1952.
1960-61=100

<table>
<thead>
<tr>
<th>Years</th>
<th>Production</th>
<th>Production</th>
<th>Area harvest</th>
<th>Area harvest, Yield</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tons</td>
<td>Index</td>
<td>Hectares</td>
<td>Index</td>
<td></td>
</tr>
<tr>
<td>1952</td>
<td>6,512</td>
<td>70.9</td>
<td>*7,002</td>
<td>69.3</td>
<td>*.930</td>
</tr>
<tr>
<td>1953</td>
<td>2,751</td>
<td>29.9</td>
<td>*3,998</td>
<td>39.6</td>
<td>*.688</td>
</tr>
<tr>
<td>1954</td>
<td>3,600</td>
<td>39.2</td>
<td>*4,979</td>
<td>49.3</td>
<td>*.723</td>
</tr>
<tr>
<td>1955</td>
<td>4,574</td>
<td>49.8</td>
<td>*4,998</td>
<td>49.5</td>
<td>*.915</td>
</tr>
<tr>
<td>1956</td>
<td>5,785</td>
<td>63.0</td>
<td>*6,001</td>
<td>59.4</td>
<td>*.964</td>
</tr>
<tr>
<td>1957</td>
<td>6,856</td>
<td>74.6</td>
<td>*7,061</td>
<td>69.9</td>
<td>*.971</td>
</tr>
<tr>
<td>1958</td>
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<td>102.2</td>
<td>8,487</td>
<td>84.0</td>
<td>1.106</td>
</tr>
<tr>
<td>1959</td>
<td>6,663</td>
<td>72.5</td>
<td>7,410</td>
<td>73.4</td>
<td>.899</td>
</tr>
<tr>
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<td>108.8</td>
<td>9,743</td>
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<td>10,455</td>
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<td>1962</td>
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<td>10,515</td>
<td>104.1</td>
<td>.804</td>
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<td>1963</td>
<td>11,605</td>
<td>126.3</td>
<td>10,066</td>
<td>99.7</td>
<td>1.152</td>
</tr>
<tr>
<td>1964</td>
<td>10,751</td>
<td>117.0</td>
<td>11,107</td>
<td>110.0</td>
<td>.968</td>
</tr>
<tr>
<td>1965</td>
<td>13,321</td>
<td>145.0</td>
<td>11,015</td>
<td>109.1</td>
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<td>13,500</td>
<td>147.0</td>
<td>11,157</td>
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<td>1.210</td>
</tr>
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<td>1967</td>
<td>14,202</td>
<td>154.6</td>
<td>11,227</td>
<td>111.2</td>
<td>1.265</td>
</tr>
</tbody>
</table>

* Estimated figures.

Source: Table 3.
Figure 6. Index Number of Production, Area Harvested and Yield of Sisal in Venezuela, 1952-1967

1960-61 = 100

Index

Production ———
Area harvested ———
Yield ———

<table>
<thead>
<tr>
<th></th>
<th>1952</th>
<th>1955</th>
<th>1960</th>
<th>1965</th>
<th>1967</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>360</td>
<td>340</td>
<td>320</td>
<td>300</td>
<td>280</td>
<td>260</td>
</tr>
<tr>
<td>Area harvested</td>
<td>340</td>
<td>320</td>
<td>300</td>
<td>280</td>
<td>260</td>
<td>240</td>
</tr>
<tr>
<td>Yield</td>
<td>240</td>
<td>220</td>
<td>200</td>
<td>180</td>
<td>160</td>
<td>140</td>
</tr>
</tbody>
</table>
Yield of sisal increased during the same period at a lower rate than production and area. By 1967 its increase had been 46% in relation to 1952. This means that production is explained more by area than by changes in technology.

Sisal was reported to have been sown on 1,357 farms in the state of Lara, its only producer, in 1967. Its direct costs of production have been estimated at Bs. 1,226.0/He. The support price for the highest grade fiber in 1967 was Bs. 90/Kg. This means that direct costs of production would be covered when the production per hectare was at least 1,362 Kg./He. As can be seen in Table 9 the average yield for 1967 was 1,275 Kg./He. which means on the average a loss of part of the variable costs and total loss of fixed costs plus the labor management return.

The participation of the B.A.P. in the market of this commodity has not been a very active one. This arises because the area of production is completely localized. By the same token, because sisal is a raw material that needs further processing which reduces volume, the localization of the industry has been

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8/ The B.A.P. financed loans for this fiber on the basis of Bs. 1,030.0/He. during 1966, but later it was estimated that the cost per hectare in "campesinos" settlements was Bs. 1,150.0/He. and for nonsettlements Bs. 1,500.0/He. The average of the three is Bs. 1,226.0/He.
based on production requirements instead of markets for the final product. In this way the relationship between buyers and sellers has been a direct one and the support price has acted as a reference price at which the industry has always bought the raw material.

Throughout the analysis of the six supported commodities it is observed for all of them, except black beans, that production has increased during the period analyzed, but always explained in considerable degree by area harvested. This situation makes it necessary to review the land used for all crops during a relatively long period in order to see if transference of land from one crop to others has occurred. The period chosen was 1955-1967 because it was found that during 1950-1958 the agricultural sector did not present relevant changes, so the land distribution among crops between 1950-1955 was estimated to be approximately the same as that during 1955-1958.

It was found that the vegetable sub-sector occupied and harvested an area of 1,025,291 hectares in 1955 and that for 1967 the total area harvested for the same sub-sector was 1,678,329 hectares. This means that in 13 years 653,038 new hectares were put into production in this sub-sector, amounting to 63.6% more land than in 1955.
Table 10. Interannual Variations of Land Harvested in Venezuela. Sub-sector Vegetables.  
In Hectares and Percent

<table>
<thead>
<tr>
<th>Year</th>
<th>Absolute Variation</th>
<th>Relative Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955-56</td>
<td>59,822</td>
<td>5.83</td>
</tr>
<tr>
<td>1956-57</td>
<td>(5,873)</td>
<td>-.54</td>
</tr>
<tr>
<td>1957-58</td>
<td>18,876</td>
<td>1.75</td>
</tr>
<tr>
<td>1958-59</td>
<td>36,752</td>
<td>3.34</td>
</tr>
<tr>
<td>1959-60</td>
<td>219,242</td>
<td>19.32</td>
</tr>
<tr>
<td>1960-61</td>
<td>(65,824)</td>
<td>-4.86</td>
</tr>
<tr>
<td>1961-62</td>
<td>110,316</td>
<td>8.56</td>
</tr>
<tr>
<td>1962-63</td>
<td>3,069</td>
<td>.22</td>
</tr>
<tr>
<td>1963-64</td>
<td>59,992</td>
<td>4.28</td>
</tr>
<tr>
<td>1964-65</td>
<td>76,226</td>
<td>5.22</td>
</tr>
<tr>
<td>1965-66</td>
<td>31,196</td>
<td>2.03</td>
</tr>
<tr>
<td>1966-67</td>
<td>109,154</td>
<td>6.96</td>
</tr>
</tbody>
</table>

Source: Tables 3, 4, 5, 6, 7, 8, and 9.
Table 10 shows the interannual variation in land used by the "vegetable" sub-sector during the period 1955-1967. It is observed that the largest increase of land used for vegetables was in 1960; i.e., when support prices and public credit programs started to be increased substantially. The second largest increase in land used was in 1962, one year after the support price program had been increased for the six commodities here analyzed. For this reason, this large increase in land should be related to the starting point of the support price program as a source of increasing production.

From Table 3 to Table 12 can be observed the variation in the use of land for the supported commodities. First of all, it is observed that the proportion of total cropland used for producing rice decreased between 1955-1958 to start again to use proportionately more land in 1959 (when it was included in the support price program). For 1967 its participation had increased to 8.28%. This means that at least some commodities failed to increase the use of land in the necessary proportion to keep its relative importance constant. What is more important, rice used by 1967 a larger proportion of the new land incorporated into production.

Corn has increased its relative position only slightly since 1955 but it has occupied around 30% of the total cultivated land since 1960 (when it was included again in the support price program).
It is the leading commodity in land use. However, its relative importance during 1966 and 1967 declined slightly. Black beans has increased its relative participation in relation to 1955, but during the period 1956-1961 the position of this crop in terms of use of land was larger than in 1967.

Table 11. Percent of Land Use in Venezuela by the Supported Commodities and the Vegetable Sub-sector as a Whole. Selected Years.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>6.05</td>
<td>1.05</td>
<td>2.51</td>
<td>3.09</td>
<td>4.54</td>
<td>6.83</td>
<td>8.28</td>
</tr>
<tr>
<td>Corn</td>
<td>25.08</td>
<td>27.09</td>
<td>24.71</td>
<td>29.41</td>
<td>30.17</td>
<td>30.03</td>
<td>29.11</td>
</tr>
<tr>
<td>Black beans</td>
<td>3.84</td>
<td>4.42</td>
<td>4.74</td>
<td>7.30</td>
<td>5.17</td>
<td>4.24</td>
<td>4.29</td>
</tr>
<tr>
<td>Potatoes</td>
<td>1.07</td>
<td>0.92</td>
<td>1.28</td>
<td>1.34</td>
<td>0.72</td>
<td>1.05</td>
<td>1.03</td>
</tr>
<tr>
<td>Cotton</td>
<td>1.66</td>
<td>2.93</td>
<td>3.85</td>
<td>4.06</td>
<td>3.90</td>
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<td>2.96</td>
</tr>
<tr>
<td>Sisal</td>
<td>0.49</td>
<td>0.77</td>
<td>0.65</td>
<td>0.72</td>
<td>0.81</td>
<td>0.72</td>
<td>0.67</td>
</tr>
<tr>
<td>Sub-total</td>
<td>38.19</td>
<td>37.18</td>
<td>37.74</td>
<td>45.92</td>
<td>45.31</td>
<td>45.86</td>
<td>46.34</td>
</tr>
<tr>
<td>All other commodities</td>
<td>61.81</td>
<td>62.82</td>
<td>62.26</td>
<td>54.08</td>
<td>54.69</td>
<td>54.14</td>
<td>53.66</td>
</tr>
<tr>
<td>Accumulated total</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Tables 3, 4, 5, 6, 7, 8 and 9.

Table II shows how land has been used before and after the support price program was applied to each commodity. The program started in 1959 for rice, in 1960 for corn, black beans,
and sisal, and in 1961 for potatoes and cotton. The leading commodities: rice and corn show rapid increase in the proportional participation of land use with the starting point of the program. Black beans also increased immediately but then fell back to its former relative position. On the other hand potatoes and cotton did not show positive response to the program in relation to most nonsupported crops. It is clear that the supported commodities as a group have increased their participation in land use more rapidly than all the rest of the commodities as a group.

From the former Tables 10 and 11 it may be guessed that those commodities that increased their participation in the total acreage harvested accomplished the increase mainly by using new land but not by transference from one commodity to another. This is evidenced by the increase of 63.6% of new land between 1955 and 1967 and the short variation of the nonsupported commodities. The commodities that decreased their participation might have kept constant their area harvested, as cocoa did, increase their area but less than proportional in relation to the increase of the total, as the majority did, or decreased their land harvested as the case of coffee and some roots. The commodities that declined in area harvested during the period, and the amount of their reduction is shown in Table 12.
As depicted in absolute terms in Table 12, the changes from one commodity to another during the period 1955-1967 is not a significant one. Nevertheless, larger variations were found between 1960 and 1967, where noticeable changes took effect in three commodities usually cultivated by "campesinos" (black beans, kidney beans and cotton). The other variations, except those shown in potatoes, coffee and tobacco, also corresponded to reductions made by "campesinos" growers. The movement of land cultivated is not very significant either, it is only 7.3% of the
total increase in new land from 1955 to 1967. However, it can be taken for sure that part of the land dropped by "campesinos" was transferred to rice and sesame mainly.

From the foregoing it can be inferred that the noticeable increase in the area harvested in Venezuela of some commodities, especially the supported ones (except black beans) and sesame did not result from switching from one crop to another. The increase was due almost entirely to the addition of new land into cultivation in the vegetable sub-sector.

**Prediction Models of Production and Area Harvested for the Supported Commodities**

As stated in the introduction, the use of multiple regression analysis is useful in this case to test the hypothesis that support prices in Venezuela have been the primary instrument in achieving self-sufficiency in the production of some agricultural commodities and a primary factor in the development of the agricultural sector.

It was assumed that the model that best explained the actual stage of agricultural production in Venezuela for each commodity tested is:

\[ Y = \beta_0 X_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \]

Where

\[ Y = \text{production of a given commodity in a year, expressed in} \]

thousand tons.

\[ X_1 = \text{amount of loans given by the B.A.P. to growers of a given commodity, in a year, expressed in thousand of bolivares.} \]

\[ X_2 = \text{Total area harvested of a given commodity in a year, expressed in thousand of hectares.} \]

\[ X_3 = \text{Grade of technology applied in the culture of a given commodity, expressed in tons/hectares.} \]

\[ X_4 = \text{support price of a given commodity.} \]

\[ \beta_0 = \text{the overall effect.} \]

\[ \beta_1 \text{ to } \beta_4 = \text{the credit effect, the area effect, the technology effect and the support price effect.} \]

Technology is represented by yield because complete data about the use of machinery, fertilizers, chemicals, etc., is not available. But because any technological advance is reflected in yields, it is assumed that the use of those factors can be estimated by yields.

In order to approximate a model that will fit the best prediction equation, a 1948-67 series was taken for rice, corn, potatoes and cotton, and another one from 1952 to 1967 for black beans and sisal. In this model support price was made equal to "zero" when it did not exist, and equal to "one" for those years the program was
operating. This procedure shows the effect of support price on production as a guaranteed price, but it does not indicate the effect of a given level of the support price. The regression equation obtained in this way is not an average of two different extrapolated lines, one considering support price and the other not considering it, but it is a regression equation that increases or decreases with constant slope when support price is included. Its reliability can be observed in Table 17 where the predicted $\hat{Y}$ is compared with $Y$. Let us call this model "one".

By using the foregoing procedure the following association was found between production and the independent variables measured by the coefficient of determination $R^2$ (Table 13).

Table 13 shows that when using the discussed equation the best single predictor seems to be area, except for black beans and potatoes. Technology gave better predictability for these crops. Area explained 95% of the variation in the production of rice; 94% of the variation in corn production; 83% of the variation in cotton production and 79% of the variation in sisal production.

The prediction equations for these commodities were found to be:

- **Rice:** $\hat{Y}_1 = -84.5085 + 1.8614 (X_2) + .0476 (X_3)$
- **Corn:** $\hat{Y}_1 = -433.7667 + 1.1397 (X_2) + .3732 (X_3)$
- **Black beans:** $\hat{Y}_1 = -29.4488 + .5337 (X_2) + .0537 (X_3)$
Table 13. Association Between Y and $X_1$, $X_2$, $X_3$, and $X_4$ According to Model One

<table>
<thead>
<tr>
<th></th>
<th>Rice</th>
<th>Corn</th>
<th>Black beans</th>
<th>Potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .95$</td>
<td>$R^2 = .94$</td>
<td>$R^2 = .42$</td>
<td>$R^2 = .88$</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .79$</td>
<td>$R^2 = .77$</td>
<td>$R^2 = .28$</td>
<td>$R^2 = .83$</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .63$</td>
<td>$R^2 = .69$</td>
<td>$R^2 = .07$</td>
<td>$R^2 = .50$</td>
</tr>
<tr>
<td>Supp. Pr.</td>
<td>$R^2 = .45$</td>
<td>$R^2 = .04$</td>
<td>$R^2 = .05$</td>
<td>$R^2 = .48$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .83$</td>
<td>$R^2 = .79$</td>
</tr>
<tr>
<td>Sup. Pr.</td>
<td>$R^2 = .72$</td>
<td>$R^2 = .77$</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .27$</td>
<td>$R^2 = .62$</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .07$</td>
<td>$R^2 = .45$</td>
</tr>
</tbody>
</table>

(-) the $r$ value is negative.
Potatoes: $Y_1 = -62.9889 + 0.00291 (X_1) + 5.8790 (X_2) + 0.01036 (X_3)$

Cotton: $Y_1 = -26.3897 + 0.6821 (X_2) + 0.0372 (X_3) + 2.6459 (X_4)$

Sisal: $Y_1 = -6.3481 + 0.00124 (X_1) + 0.5572 (X_2) + 0.0099 (X_3)$

As can be seen from the equations, the support price is significant only for cotton. This result prompted the use of three other models. The first model does not contain support price because the program did not exist within those years. It will have only three independent variables. The second model does contain support price between 1960-1967 for all supported commodities, but excludes $X_4$ so the support price effect will be spread on the other independent variables. And a third model, similar to the former, but including in it $X_4$. These three models will be called "two", "three", and "four", respectively.

Model "two" will say which factors influenced production before support prices started to be used.

$$
\hat{Y} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3
$$

Where all the variables and coefficients have the same meaning as before.

The association between production and the independent variables was found to be as in Table 14.
Table 14. Association between Y and X₁, X₂, and X₃ According to Model "Two"

<table>
<thead>
<tr>
<th></th>
<th>Rice</th>
<th>Corn</th>
<th>Black beans</th>
<th>Potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .53$</td>
<td>Area</td>
<td>$R^2 = .36$</td>
<td>Tech.</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .37$</td>
<td>Tech</td>
<td>$R^2 = .25$</td>
<td>Credit</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .29$</td>
<td>Credit</td>
<td>$R^2 = .06$</td>
<td>Area</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .94$</td>
<td>Area</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .58$</td>
<td>Tech</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .21$</td>
<td>Credit</td>
</tr>
</tbody>
</table>

(−) r had negative sign.
This table shows that for the period when support prices did not exist, production was also explained by area. The prediction equations cannot be considered good predictors because, as it was seen before, production during the 1960s has increased substantially, which means that conditions for equation "Two" have changed during 1960s.

Looking for more accurate predictors than those used in Model "Two" it was thought advisable to develop Model "Three" in the same way Model "Two" was developed, but for the years the support price program has been in execution for each one of the supported analyzed commodities, but without the inclusion of the $X_4$ variable. Using this model the levels of association found between production and the independent variables were as in Table 15.

Again area is found to be the best predictor to explain the variation in production. It is interesting to observe that for cotton and sisal the best predictor changed from area to technology and that for black beans and potatoes the inverse occurred.

Because in Model "Three" the effect of support price is in each one of the variables, it can be said that if comparison with Model "One" does not show large difference for the $b$ values, then the effect of support price ($X_4$) can be justifiably isolated. To make this comparison it is necessary to find the $\hat{Y}_3$ values.
Table 15. Association Between Y and $X_1$, $X_2$, and $X_3$ According to Model "Three"

<table>
<thead>
<tr>
<th>Rice</th>
<th>Corn</th>
<th>Black beans</th>
<th>Potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .98$</td>
<td>$R^2 = .86$</td>
<td>$R^2 = .90$</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .83$</td>
<td>$R^2 = .85$</td>
<td>$R^2 = .79$</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .76$</td>
<td>$R^2 = .64$</td>
<td>$R^2 = .32$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech.</td>
<td>$R^2 = .86$</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .74$</td>
</tr>
<tr>
<td>Area</td>
<td>$R^2 = .53$</td>
</tr>
</tbody>
</table>

(-) The γ had negative sign.
according to Model "Three" and compare them with the \( \hat{Y}_1 \) values.

Rice: \[ \hat{Y}_3 = -111.0465 + 2.1588 (X_2) + .0602 (X_3) \]

Corn: \[ \hat{Y}_3 = -387.1238 + .9645 (X_2) + .4130 (X_3) \]

Black beans: \[ \hat{Y}_3 = -34.4158 + .5054 (X_2) + .0695 (X_3) \]

Potatoes: \[ \hat{Y}_3 = -156.8873 + 7.6419 (X_2) + .0204 (X_3) \]

Cotton: \[ \hat{Y}_3 = -19.8484 + .5687 (X_2) + .0425 (X_3) \]

Sisal: \[ \hat{Y}_3 = -10.1548 + .8014 (X_2) + .0122 (X_3) \]

As can be seen, variation between the \( b \) values of Model "One" and Model "Three" are not large except for potatoes. This evidences again that support price is not very significant.

Model "Four" includes the real values of \( X_4 \), instead of "ones" and "zeros" which is also useful to see the effect of a given level of support price. For this model, the association between \( Y \) and the independent variables was found to be as in Table 16.

The comparison of Table 16 with Table 15 reveals that both tables have the same distribution of the independent variables, with the difference that Table 16 includes support prices which sometimes interrupts the order. Moreover, the different \( R^2 \) values are the same in both tables; i.e., association between production and the independent variables did not change with the inclusion of support price, which also says that support price
Table 16. Association Between Y and $X_1$, $X_2$, $X_3$, and $X_4$ According to Model "Four".

<table>
<thead>
<tr>
<th></th>
<th>Rice</th>
<th>Corn</th>
<th>Black beans</th>
<th>Potatoes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>$R^2 = .98$</td>
<td>$R^2 = .86$</td>
<td>$R^2 = .90$</td>
<td>$R^2 = .86$</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .83$</td>
<td>$R^2 = .85$</td>
<td>$R^2 = .77$</td>
<td>$R^2 = .62$</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .76$</td>
<td>$R^2 = .64$</td>
<td>$R^2 = .32$</td>
<td>$R^2 = .58$</td>
</tr>
<tr>
<td>Supp. Pr.</td>
<td>$R^2 = .56$</td>
<td>$R^2 = .42$</td>
<td>$R^2 = .11$</td>
<td>$R^2 = .44$</td>
</tr>
<tr>
<td>Cotton</td>
<td>Tech.</td>
<td>Sisal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .86$</td>
<td>$R^2 = .94$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .74$</td>
<td>$R^2 = .58$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supp. Pr.</td>
<td>$R^2 = .73$</td>
<td>$R^2 = .34$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>$R^2 = .53$</td>
<td>$R^2 = .18$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(-) $r$ had negative sign.
should not be relevant in the $\hat{Y}$ calculation. In effect the predicted equations for Model "Four" are:

Rice: $\hat{Y}_4 = -111.9405 + 1.8882 (X_2) + .0617 (X_3)$

Corn: $\hat{Y}_4 = -387.1238 + .9645 (X_2) + .4130 (X_3)$

Black beans: $\hat{Y}_4 = -34.4158 = .5054 (X_2) + .0695 (X_3)$

Potatoes: $\hat{Y}_4 = -273.9306 + 7.9080 (X_2) + .0259 (X_3) + 1.5500 (X_4)$

Cotton: $\hat{Y}_4 = -19.8484 + .5687 (x_2) + .0425 (X_3)$

Sisal: $\hat{Y}_4 = -10.1548 + .8014 (X_2) + .0122 (X_3)$

This shows that support price is only significant for potato production.

The decision for a good prediction model asks for an analysis in which comparison between the predicted values for each commodity and their real values can be made. Taking the period 1960-1967 and given real values to each of the independent variables in each model (except Model "Two" which does not include this period) and comparing the estimated or predicted $\hat{Y}$ with the actual $Y$, it would indicate the reliability of each of the models. By doing this (Table 17) it was found that Model "One" was the best predictor for cotton; Model "Three" the best predictor for corn, black beans, potatoes and sisal, and Model "Four" the best predictor for rice,
Table 17. Predicted $\hat{Y}$ According to Models "1", "3", and "4" as Compared with Actual $Y$

<table>
<thead>
<tr>
<th>Years</th>
<th>Rice</th>
<th>Corn</th>
<th>Black Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actual</td>
<td>Model 1</td>
<td>Model 3</td>
</tr>
<tr>
<td>1960</td>
<td>72</td>
<td>75</td>
<td>83</td>
</tr>
<tr>
<td>1961</td>
<td>81</td>
<td>89</td>
<td>97</td>
</tr>
<tr>
<td>1962</td>
<td>103</td>
<td>115</td>
<td>128</td>
</tr>
<tr>
<td>1963</td>
<td>131</td>
<td>138</td>
<td>156</td>
</tr>
<tr>
<td>1964</td>
<td>166</td>
<td>172</td>
<td>195</td>
</tr>
<tr>
<td>1965</td>
<td>200</td>
<td>199</td>
<td>230</td>
</tr>
<tr>
<td>1966</td>
<td>210</td>
<td>205</td>
<td>235</td>
</tr>
<tr>
<td>1967</td>
<td>292</td>
<td>274</td>
<td>316</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Thousand tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
</tr>
<tr>
<td>Corn</td>
</tr>
<tr>
<td>Black Beans</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years</th>
<th>Potatoes</th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>134</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>1961</td>
<td>74</td>
<td>34</td>
<td>9</td>
</tr>
<tr>
<td>1962</td>
<td>121</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>1963</td>
<td>111</td>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td>1964</td>
<td>124</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>1965</td>
<td>136</td>
<td>39</td>
<td>13</td>
</tr>
<tr>
<td>1966</td>
<td>143</td>
<td>38</td>
<td>14</td>
</tr>
<tr>
<td>1967</td>
<td>151</td>
<td>39</td>
<td>14</td>
</tr>
</tbody>
</table>
corn, black beans, and sisal; i.e., that Models "Three" and "Four" each accounted for the prediction of four commodities. Model "Four" tended to overestimate cotton production but it is still for this commodity a good estimator. With potatoes it is also a good estimator but underestimated the Y values. So it is not a wrong decision to take Model "Four" as the best predictor if these observations for cotton and potatoes are carefully considered.

At this point of the analysis it is clear that:

1. Area is the best predictor of production.
2. That given the relatively large volume of production and area, the effect of support price and credit do not seem to be significant.

But in view of the conditions of agricultural surpluses, it is difficult to accept the statement that support price is not significant in determining the level of production, especially when it can be shown empirically that physical increase of Y had occurred when the support price program was initiated. For this reason further analysis is necessary. The first additional thing to do is to test the hypothesis that support price is "zero"; i.e., that it is not significant in determining the volume of production.

To test this hypothesis, Models "Three" and "Four" will be used to isolate the sum of squares of error for \( X_4 \). Subsequently an F test is used that would reject \( H_0: \beta_4 = 0 \) when \( F > F_{0.05} \).
Rice:
\[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_{X_4} = 118.6382 \]

\[
F = \frac{\text{SSE}_{X_4}}{\text{MSE}_4} = \frac{118.6382}{61.1578} = 1.9290 \]

\[
V_1 = p-1=4; \quad V_2 = n-p=31
\]

\[ F = 1.9290; \quad V_2=31 \approx 2.68 \]

So it does not reject Ho, which means that for this crop support price is not significant.

Corn:
\[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_{X_4} = 79.7732 \]

\[
F = \frac{\text{SSE}_{X_4}}{\text{MSE}_4} = \frac{79.7732}{318.3577} = 0.2510 < F; 4; 27
\]

\[ F = 0.2510; \quad V_2=27 \approx 2.73 \]

It does not reject Ho, so support price is not significant in this case either.

Black beans:
\[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_{X_4} = 0.02217 \]

\[
F = \frac{\text{SSE}_{X_4}}{\text{MSE}_4} = \frac{0.02217}{0.08237} = 0.2700 < F; 4; 27
\]

It does not reject Ho either.
Potatoes: \[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_X = 9.7489 \]

\[ F = \frac{\text{SSE}_X}{\text{MSE}_4} = \frac{9.7489}{.7767} > F_{4;23} \]

\[ F_{4;23} = 2.80 \]

It rejects Ho and concludes that support prices is significant for potatoes at the 95% probability level.

Cotton: \[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_X = .5000 \]

\[ F = \frac{\text{SSE}_X}{\text{MSE}_4} = \frac{.5000}{.1515} = 3.3 > F_{4;23} \]

\[ F_{4;23} = 2.80 \]

It rejects Ho and concludes that support price is significant for cotton at the 95% probability level.

Sisal: \[ \text{SSE}_3 - \text{SSE}_4 = \text{SSE}_X = .02658 \]

\[ F = \frac{\text{SSE}_X}{\text{MSE}_4} = \frac{.02658}{.5889} < F_{4;23} \]

It does not reject Ho, so support price is not significant in this case.

From the former analysis it was found that support price is significant for only two commodities of the six analyzed. The
next step is discussed below.

Previous analysis has shown that area harvested is the best predictor for production of the supported commodities, so it is useful to know the elements that in large degree have influenced the increase of land use. To learn this, it was assumed that area harvested is a function of the volume of public credit to be used in the culture of agricultural commodities, of the level of support prices, and the available technology measured by the previous year's average yield. As in former cases, two models will be fitted, one with the entire series from 1948 to 1967 using values "zero" and "one" for support prices, following the previous criterion. This model will be called Model "Five." The other model is one that contains the real values for support prices, and will be called Model "Six."

\[ Y_a = \beta_0 + \beta_1 X_1 + \beta_3 X_3 - 1 + \beta_4 X_4 \]

Where

- \( Y_a \) = area harvested for a particular commodity during a year expressed in thousand hectares
- \( \beta_0 \) = the overall effect
- \( \beta_1 \) = the credit effect
- \( \beta_3 \) = the technology effect
- \( \beta_4 \) = the support price effect
- \( X_1 \) = the volume of loans furnished by the Agricultural and Livestock Bank to cultivate a given commodity
during a given year, expressed in thousand of bolívares.

\[ X_3 - 1 = \text{the level of technology used which is equal to} \]
\[ \text{the former year yields, expressed in,} \]
\[ \text{kilograms per hectare.} \]

\[ X_4 = \text{the support price.} \]

The level of association between area and the independent variables, measured by \( R^2 \), in Model "Five" is shown in Table 18.

According to the association between area and the other variables, support price has been the best predictor of area for the period 1948-67; credit has been the second one, and technology the last one. This can be interpreted by saying that Venezuelan farmers cultivate some commodities based more on the availability of credit and a guaranteed price than based on the yields such commodities might produce. The negative correlation between area and technology is found in those commodities that have presented the lowest yield during the analyzed period. This suggests there is possibility for increased production of corn, black beans, and cotton to be achieved by increasing the yields of these commodities, and this can be accomplished only by the use of more technology.

The prediction equations for the model are:
Table 18. Association Between Area and $X_1$, $X_3$, and $X_4$ According to Model "Five"

<table>
<thead>
<tr>
<th></th>
<th>Rice</th>
<th>Corn</th>
<th>Black beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>$R^2 = .74$</td>
<td>Supp. Pr.</td>
<td>$R^2 = .92$ Credit</td>
</tr>
<tr>
<td>Tech.</td>
<td>$R^2 = .61$</td>
<td>Credit</td>
<td>$R^2 = .83$ Supp. Pr.</td>
</tr>
<tr>
<td>Sup. Pr.</td>
<td>$R^2 = .38$</td>
<td>Tech.</td>
<td>$R^2 = .37$ Tech.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Potatoes</th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech.</td>
<td>$R^2 = .49$</td>
<td>Tech.</td>
<td>$R^2 = .72$ Supp. Pr.</td>
</tr>
<tr>
<td>Credit</td>
<td>$R^2 = .35$</td>
<td>Supp. Pr.</td>
<td>$R^2 = .52$ Tech.</td>
</tr>
<tr>
<td>Sup. Pr.</td>
<td>$R^2 = .14$</td>
<td>Credit</td>
<td>$R^2 = .31$ Credit</td>
</tr>
</tbody>
</table>

(* r had negative sign.*)
Rice \[ \hat{Y}_5 = \hat{X}_2 = 2.9263 + .00189 (X_1) + .0355 (X_3) \]

Corn \[ \hat{Y}_5 = \hat{X}_2 = 260.4856 + 130.1424 (X_4) \]

Black beans \[ \hat{Y}_5 = \hat{X}_2 = 46.4357 + .00515 (X_1) \]

Potatoes \[ \hat{Y}_5 = \hat{X}_2 = 7.8960 + .00085 (X_3) \]

Cotton \[ \hat{Y}_5 = \hat{X}_2 = 3.7304 + .0025 (X_1) + 20.8975 (X_4) \]

Sisal \[ \hat{Y}_5 = \hat{X}_2 = 6.0000 + 4.4625 (X_4) \]

The necessity of checking another model but with data for the period when support prices were in effect arises from the fact that support price tends to be a static factor equal to "one" in the model which gives for corn and sisal constant area harvested regardless of the year.

The so-called Model "Six" gave the association between area and the other variables as shown in Table 19.

Analyzing the period that included support prices and giving actual support values to each commodity instead of "ones" and "zeros", it was found that credit is the most significant predictor of area to be devoted to these crops. To clarify this contradiction with Table 18 it is necessary to analyze the residual for both models and see which of them is the best predictor of area to be devoted to these specified crops.

Rice \[ \hat{Y}_6 = \hat{X}_2 = 16.3758 + .00240 (X_1) \]

Corn \[ \hat{Y}_6 = \hat{X}_2 = -21.1241 + .00695 (X_1) \]

Black beans \[ \hat{Y}_6 = \hat{X}_2 = 38.4644 + .00426 (X_1) \]
Table 19. Association Between Area and \( X_1, X_3 \) and \( X_4 \) According to Model "Six"

<table>
<thead>
<tr>
<th>Rice</th>
<th>Corn</th>
<th>Black Beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit</td>
<td>( R^2 = .83 )</td>
<td>( R^2 = .88 )</td>
</tr>
<tr>
<td>Tech.</td>
<td>( R^2 = .56 )</td>
<td>( R^2 = .75 )</td>
</tr>
<tr>
<td>Supp. Pr.</td>
<td>( R^2 = .49 )</td>
<td>( R^2 = .34 )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potatoes</th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tech.</td>
<td>( R^2 = .44 )</td>
<td>( R^2 = .64 )</td>
</tr>
<tr>
<td>Credit</td>
<td>( R^2 = .31 )</td>
<td>( R^2 = .24 )</td>
</tr>
<tr>
<td>Supp. Pr.</td>
<td>( R^2 = .28 )</td>
<td>( R^2 = .02 )</td>
</tr>
</tbody>
</table>

(-) the \( r \) value had negative sign
Potatoes  \[ \hat{Y}_6 = \hat{X}_2 = 2.0608 + .00232 (X_3) \]

Cotton  \[ \hat{Y}_6 = \hat{X}_2 = -78.2541 + 1.3057 (X_4) \]

Sisal  \[ \hat{Y}_6 = \hat{X}_2 = \]  (no significant t values when \( \alpha = .05 \))

The determination of a prediction equation for sisal according to Model "Six" becomes impossible due to the fact that there is not enough data. For instance credit has "zero" values for five of the eight years. Since credit is the variable that presented the highest correlation with the area it is obvious that the model is seriously affected by lack of information about credit.

Throughout the analysis of the residuals in the series from 1960-1967 it was found that Model "Five" is the best predictor for the area. However, it underestimates the area harvested for corn and cotton, being less accurate for corn because all the values through the period depend on the constant only; i.e., that the independent variable that completes the model does not add very much to it. The same is found in the case of sisal, but due to the fact that area for this commodity tends to be static, the prediction equation seems to be a good one.

The problems found with Model "Five" means that it would be a good predictor for area as long as the present conditions do not change significantly.

The adequacy of Model "Five" to explain the variations in the area harvested means that support prices have been the best
predictor for the variation of area because as was seen in the equations for this model support price was present in three of them. Public credit becomes the second best predictor of area. So it seems that the growth of the Venezuelan agriculture for the six analyzed commodities is a consequence of the extensive use of land, but it probably would not have occurred to the same degree if support prices and public credit programs had not been put in operation.
Table 20. Predicted $X_2$ According to Models "5" and "6" as Compared with the Actual $X_2$ in Thousand of Hectares

<table>
<thead>
<tr>
<th>Years</th>
<th>Rice $X_2$</th>
<th>Corn Actual Model 5 6</th>
<th>Black beans Actual Model 5 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>42</td>
<td>65 34</td>
<td>398 391 281</td>
</tr>
<tr>
<td>1961</td>
<td>58</td>
<td>98 60</td>
<td>389 287 65 70 58</td>
</tr>
<tr>
<td>1962</td>
<td>69</td>
<td>94 70</td>
<td>483 380 47 49 40</td>
</tr>
<tr>
<td>1963</td>
<td>74</td>
<td>104 77</td>
<td>427 313 55 57 47</td>
</tr>
<tr>
<td>1964</td>
<td>91</td>
<td>144 116</td>
<td>443 378 64 54 44</td>
</tr>
<tr>
<td>1965</td>
<td>105</td>
<td>135 102</td>
<td>462 378 65 52 43</td>
</tr>
<tr>
<td>1966</td>
<td>104</td>
<td>142 108</td>
<td>467 398 69 60 49</td>
</tr>
<tr>
<td>1967</td>
<td>139</td>
<td>146 107</td>
<td>489 391 367 72 74 61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years</th>
<th>Potatoes</th>
<th>Cotton</th>
<th>Sisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>18</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>1961</td>
<td>9</td>
<td>14</td>
<td>19</td>
</tr>
<tr>
<td>1962</td>
<td>16</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>1963</td>
<td>15</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>1964</td>
<td>15</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>1965</td>
<td>16</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>1966</td>
<td>16</td>
<td>15</td>
<td>22</td>
</tr>
<tr>
<td>1967</td>
<td>17</td>
<td>15</td>
<td>22</td>
</tr>
</tbody>
</table>
CHAPTER III

INTERRELATIONSHIP BETWEEN THE AGRICULTURAL SECTOR AND THE OTHER SEGMENTS OF THE ECONOMY

The Gross National Product and National Income

1) The Gross National Product: The format of this discussion follows the traditional classification of the Venezuelan economy as outlined by the Central Bank of Venezuela "B. C. V." in its annual economic reports. The gross national product has been divided into eight economic sectors: agriculture, mining, petroleum, manufactures, electricity, commerce, transport and communication, and services.

Transport and communication includes the means of transport plus telephones, cables, telegrams, telex, roads, etc. Services include mainly education, health, personal services and recreation. Commerce involves the activities done by wholesalers, retailers, and other business firms. The other sectors are self-explanatory.

The relevant characteristics of the developing country of Venezuela may be observed in the analysis of its product during the period 1960-1966. However, before going into details

9/ Because the calculation of the G. N. P. is available to the public at the beginning of the third quarter of the next year through the economic report of the Central Bank, figures for 1967 are not yet available for all the sectors.
concerning its G.N.P., it is necessary to show some indication of the overall economy in relation to South America because this will contribute to the understanding of some of the paradoxes of the country.

It has been estimated that Venezuela has the highest gross domestic product and the highest per capita real income in all of South America (23). At the same time, its money unit in the 1960s was one of the most stable in the world, reflecting during the period 1965-1966 a devaluation of only 0.1% (5). In spite of these positive signs of a developed economy, it is found that for 1960 approximately half of the total population lived close to the subsistence level (10). The rural population, as stated previously, amounts to a high percentage of the total, but agriculture is not one of the most important sectors of the economy. Even though food production is increasing very rapidly with a rate estimated in the neighborhood of 7% annually within the period 1962-67 (36), there is a considerable deficit of calories and proteins in the Venezuelan diet.

The gross national product, at current prices, was estimated (Banco Central de Venezuela 1967) for 1966 at Bs. 39.1 billion, which meant an increase of 3.7% over the estimate for 1965. But considering the effect of prices and measuring the product at 1957 prices, the G.N.P. so measured is reduced to
Bs. 34.8 billion or an increase of only 2.4% in relation to the figure of Bs. 34.0 billion for 1965. This growth rate of 2.4% is considered too low in comparison to those achieved in the years between 1962-65. The lower rate is partially explained by a decrease of 2.7% in the petroleum gross product, difficulties of the manufacture sector to maintain its former rate of growth, and uncertainties of outlook in the overall economy due to discussion in the Congress of some modification laws closely related to the productive activity.

The period 1960-1963 has been identified as a recession in which one of the most affected segments was construction. For over ten years previously construction had been emphasized over other types of public investment - first as a primary goal, later as an emergency plan to absorb the unemployed labor force when that sector began to decline at the end of the 1950s. Construction is important in the formation of the gross national product because it employs a significant number of nonspecialized workers, a group whose members have normally migrated from the agricultural industry to cities.

So a recession in that segment of the economy is more noticeable because it reduced sharply the purchasing power of a large portion of the economically-active population. Its influence in this aspect is more important than agriculture, because, as it was pointed out in the introduction of this thesis, the farmers as a group have insufficient purchase power to significantly affect the demand for
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1.8</td>
<td>6.7</td>
<td>6.6</td>
<td>1.9</td>
<td>6.7</td>
<td>2.1</td>
</tr>
<tr>
<td>Mining</td>
<td>.5</td>
<td>1.7</td>
<td>.4</td>
<td>1.3</td>
<td>.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Petroleum</td>
<td>7.7</td>
<td>29.1</td>
<td>7.9</td>
<td>29.2</td>
<td>8.7</td>
<td>30.3</td>
</tr>
<tr>
<td>Manufacture</td>
<td>2.9</td>
<td>11.0</td>
<td>3.1</td>
<td>11.4</td>
<td>3.4</td>
<td>11.7</td>
</tr>
<tr>
<td>Construction</td>
<td>1.6</td>
<td>6.2</td>
<td>1.5</td>
<td>5.4</td>
<td>1.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Electricity</td>
<td>.4</td>
<td>1.4</td>
<td>.4</td>
<td>1.6</td>
<td>.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Commerce</td>
<td>3.9</td>
<td>14.6</td>
<td>3.7</td>
<td>13.7</td>
<td>4.0</td>
<td>13.0</td>
</tr>
<tr>
<td>Transp. and</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>1.0</td>
<td>3.8</td>
<td>1.0</td>
<td>3.6</td>
<td>1.0</td>
<td>3.4</td>
</tr>
<tr>
<td>Services</td>
<td>6.8</td>
<td>25.6</td>
<td>7.3</td>
<td>27.1</td>
<td>7.5</td>
<td>26.1</td>
</tr>
<tr>
<td>Total G. N. P</td>
<td>26.6</td>
<td>100.0</td>
<td>27.2</td>
<td>100.0</td>
<td>28.7</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sector</th>
<th>1965 Percent</th>
<th>1966 Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>2.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Mining</td>
<td>.4</td>
<td>.4</td>
</tr>
<tr>
<td>Petroleum</td>
<td>9.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Manufacture</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Construction</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>Electricity</td>
<td>.7</td>
<td>.8</td>
</tr>
<tr>
<td>Commerce</td>
<td>5.4</td>
<td>5.6</td>
</tr>
<tr>
<td>Transp. and communication</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Services</td>
<td>8.3</td>
<td>8.7</td>
</tr>
<tr>
<td><strong>Total G.N.P.</strong></td>
<td><strong>34.0</strong></td>
<td><strong>34.8</strong></td>
</tr>
</tbody>
</table>
goods and services. In addition to the decline in the gross product from construction, the same phenomena is observed in transport and communication, mining and in commerce. In the latter two sectors, the incidence of the recession appears less painful because in mining the gross product decreased only during two years, and in the other only one year.

Mining is basically an iron ore extractive industry with a low direct contribution to the G.N.P. and employment. It was affected by the closure of the most important gold mine in the southeast part of the country. Commerce responded to the construction situation as did transport and communication. The recession wave struck the latter by immobilizing fleets of trucks used previously in the transportation of construction materials. The other sectors maintained growth throughout the period, except petroleum. The most important sector, in money terms, however, decreased the last year, 1966.

Analyzing the gross national product in relative terms, the irregularity of its growth can be observed easily. The relative growth from year to year is depicted in Table 22. It shows the lowest rate of growth for the economy as a whole in 1961 with respect to 1960. However, it is almost the same as the rate achieved in 1966 as compared with 1965. It is observed that increases in growth of the economy have been significantly variable from year

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent</td>
<td>1.7</td>
<td>6.3</td>
<td>8.5</td>
<td>7.0</td>
<td>5.6</td>
</tr>
<tr>
<td>Agriculture</td>
<td>-26.1</td>
<td>-7.0</td>
<td>-15.3</td>
<td>27.6</td>
<td>8.2</td>
</tr>
<tr>
<td>Mining</td>
<td>2.5</td>
<td>8.8</td>
<td>1.5</td>
<td>4.4</td>
<td>2.1</td>
</tr>
<tr>
<td>Petroleum</td>
<td>5.5</td>
<td>8.1</td>
<td>7.4</td>
<td>12.3</td>
<td>7.9</td>
</tr>
<tr>
<td>Manufacture</td>
<td>-10.7</td>
<td>-3.5</td>
<td>-5.7</td>
<td>10.5</td>
<td>.9</td>
</tr>
<tr>
<td>Construction</td>
<td>12.1</td>
<td>15.8</td>
<td>15.1</td>
<td>11.0</td>
<td>10.2</td>
</tr>
<tr>
<td>Electricity</td>
<td>-4.1</td>
<td>6.3</td>
<td>6.8</td>
<td>12.6</td>
<td>9.7</td>
</tr>
<tr>
<td>Commerce</td>
<td>12.1</td>
<td>15.8</td>
<td>15.1</td>
<td>11.0</td>
<td>10.2</td>
</tr>
<tr>
<td>Transp. and</td>
<td>-1.4</td>
<td>.1</td>
<td>4.9</td>
<td>11.6</td>
<td>6.8</td>
</tr>
<tr>
<td>communica-</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>tion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>7.0</td>
<td>2.2</td>
<td>2.7</td>
<td>4.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Total</td>
<td>2.2</td>
<td>4.5</td>
<td>3.7</td>
<td>7.7</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: Table 21.

The explanation of this instability can be understood by a short analysis of the components of the G.N.P.

The trend of the gross product of only two sectors (petroleum and manufacture) followed the trend of the G.N.P. of the overall economy in the analyzed period. The case of petroleum is explained if its contribution to the general economy is checked in Table 21, but the case of manufacture is unclear because it is not only less significant in the G.N.P. formation than petroleum but even less significant than services and commerce. Nevertheless, if it is remembered that services includes education, health and recreation and that these services are furnished almost
entirely by the government, it can be understood why services do not follow the general trend of the total economy. Because petroleum provides approximately 34% of the ordinary national income, the expenditures of the government must be affected primarily by this sector. But in the face of a recession in the most important sector of the Venezuelan economy, the government may use its reserves and/or foreign aid in order to alleviate the negative effect of such recession. On the other hand, in facing an expansion the government might reduce its expenditures to avoid inflation. Therefore the services sector is going to be affected directly by the government policy and it might not reflect the situation of the entire economy.

It can be said that commerce is a consequence of the quantity and quality of goods and services to be sold in the market. The quantity of goods and services depends upon national production and importation, but the amount sold is also a function of inventories. This means that in a recession the manufacture industry might reduce its production but commerce might remain constant and even increase if there are enough inventories to cover the demand.

Because of these special characteristics of services and commerce, they do not follow the general pattern of the economy in the G.N.P. formation. Nevertheless, it seems to be clear
from Tables 21 and 22 that the gross national product rate of
growth is much more determined by the variation in the petroleum
sector than variation in any of the other sectors.

The role of agriculture seems to be improving for it shows
a high rate of growth during all of the period, except between 1960
and 1961. Possible reasons for this boom in agriculture were
shown throughout Chapters I and II; i.e., basically the high
public aid given to the sector. Nevertheless, contrary to what
this situation appears to be, it is not the central purpose of the
government to make of Venezuela an agricultural country. Any
process to increase the industrialization must take account of
the supply of raw materials for industry and food for the popu-
lation. The only way to keep at home the international exchange
collected from petroleum exportation is to develop together
manufacture and agriculture and, at the same time, create pos-
sibilities for the growth of the other sectors.

Unfortunately, the manufacture sector has encountered some
problem in maintaining a high rate of growth. Like agriculture,
it has been following a policy of substitution of importations.
But while in agriculture this process is relatively easy, when
there are the three basic factors of production, or the possi-
bility of getting them, and natural conditions; in manufacture
the situation is a different one. It requires a much more
specialized labor force, research, entrepreneurs and a wide market with purchasing power sufficient to keep the industry in profitable business. Although all these conditions existed in Venezuela for the first phase of the industrialization process; i.e., the substitution of nondurable final goods and services, the second phase that requires substitution of intermediate capital goods, has found limitations in the narrow market of the country. Consequently the operation is possible only at high costs of production.

It can be guessed from the foregoing that manufacture, like agriculture, has required government protection in the form of high tariffs, quotas, or complete prohibition to import. Also included are internal programs such as easy credit, long-term payments, low interest rate and training of workers and managers.

Several factors acted to push down the rate of growth of the manufacture sector. The Central Bank of Venezuela in its 1967 annual economic report, cited among other factors the almost fulfilment of the first stage of substitution of importations of nondurable goods. It also listed as important factors the climate of expectations, restriction on bank credit, reduction in the rate of growth of the gross fixed investment by the manufacture sector, and low increase in demand for manufactured products. Although all of these factors together will affect
negatively the growth of the sector, it seems too early to conclude that the manufacture industry is declining its development in the last two years. The series examined is a short one and Table 22 shows that the rate of growth during 1964-65 is almost the same as that of 1961-1962, which is the second highest in the period, so the sharp decline in 1965 cannot be taken as a conclusive indicator of permanent restrictive forces in the growth of manufacture. However, because of its sensitivity to this economic variable and because this industry operates in Venezuela on a low volume base, slow turnover and high prices, it is possible that manufacture had been one of the sectors most affected by outlook conditions. During 1966 there were under discussion in the Congress two laws, one modifying the income tax system, and the other the social security scale of deduction on salaries. These two laws and the assumptions that entrepreneurs made around those laws, created a climate of adverse expectations that might explain part of the reduction of the industry rate of growth.

The effect of these adverse expectations in the other sectors might have had an impact but to a lesser degree, except in petroleum where there was an additive effect. The Government made a declaration to the foreign corporations extracting and processing crude petroleum to capture taxes on the difference
between company-reported prices and the real market price from 1958 on. In deriving the difference favoring Venezuela's internal revenue service, the government set a price of reference for applying the income tax. The petroleum industry, protesting government pretension, reduced its production to 1964 levels which consequently affected the gross national product.

Table 21 also gives the contribution of each of the sectors to the formation of the gross national product. The value of the agricultural production, in terms of 1957 prices, presents during the period a slowly increasing participation from 6.6% to 7.3% over the period observed. This is rather a moderate participation, but instead of being a neutral factor in the gross national product, as it was immediately after petroleum began to be produced on a commercial scale, agriculture is now contributing significantly to the overall growth of the economy. Among all the sectors, agriculture is ranked in the fifth position; its rate of growth is twice the population rate. This means the spectre of malnutrition that still haunts the country may be reduced rapidly if the low income population can share in this increasing production.

The indirect contribution of the mining sector to other sectors as a basis of development of the overall economy is more important than its direct contribution. The region where
the iron ore is extracted is considered for the future to be the most important industrial part of the country. Its population increased from an almost uninhabited region to more than 80,000 people in a period of ten years. It will produce electricity for all the east, south and central parts of the country by approximately 1970 and it is the site for many new heavy industries such as steel mills and aluminum mills.

Oil has represented since the 1930s the most important source of foreign exchange and the number one contributor to the G.N.P. As can be seen in Table 21 its contribution is almost a third of the total product. This evidences the dependence of the Venezuelan economy on a single product which is considered to be a perishable source of income. On the other hand, because national petroleum production and international prices have varied and because these variables are controlled by corporations that also control the output of other producers, the heavy dependency on petroleum tends to be harmful to the economy. The reason it is harmful is the country needs to accelerate its development. Effective planning cannot take place when such an important sector of the economy cannot be entirely harmonized with national goals.

2) The National Income: The national income in Venezuela was estimated to be Bs. 29.9 billion in 1966, which was 3.4%
higher than in 1965, but the lowest rate of growth during the period 1960-1966. Possible causes of this low rate of growth were discussed in the previous section when consideration was given to the factors affecting G. N. P. growth. It is interesting to note that the negative expectations in the economy undoubtedly affected "capital remuneration" more than "labor remuneration," shown by comparing 1966 and 1965 figures in Table 23. The labor remuneration increased in 1966 by 6% while capital remuneration remained constant.

The total depreciation was estimated to be Bs. 3.5 million during 1966, to which agriculture contributed Bs. 0.5 million. Payments to foreign countries, made by the different sectors of the economy, totaled for the same year Bs. 3.4 billion, of which agriculture paid Bs. 0.01 billion. Indirect taxes were Bs. 2.5 billion, to which agriculture contributed nothing. Subsidies amounted to Bs. 0.11 billion, of which agriculture received Bs. 0.05 billion. With these figures the G. N. P. can be calculated at current prices, which as stated before was Bs. 39.09 billion, and the contribution of agriculture to the G. N. P. at the same prices was Bs. 2.9 billion.
Table 23. National Income of Venezuela, 1964-66. Billion of bolivares. Ratio of exchange, Bs. 4.50 = $1.00

<table>
<thead>
<tr>
<th>Sector</th>
<th>Labor remuneration</th>
<th>Capital remuneration</th>
<th>National income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1.37</td>
<td>1.45</td>
<td>1.50</td>
</tr>
<tr>
<td>Petroleum</td>
<td>.99</td>
<td>1.03</td>
<td>1.05</td>
</tr>
<tr>
<td>Mining</td>
<td>.09</td>
<td>.10</td>
<td>.10</td>
</tr>
<tr>
<td>Total</td>
<td>15.23</td>
<td>16.39</td>
<td>17.37</td>
</tr>
</tbody>
</table>

Labor Force and Its Remuneration

The petroleum industry provided employment during 1966 to approximately 28,470 workers. (1) The average income for white collar workers in this industry was estimated for 1966 to be Bs. 34,177.0 per year, while laborers earned an average of Bs. 13,602.0. The average income for both groups is ranked as the highest in the overall economy.

The iron industry in 1966 employed approximately 3,362 persons with an average annual income of Bs. 22,210.0. The trend of employment here is a very slowly increasing one, estimated in 1965 to be 1.8% higher in comparison to the preceding year, and 1.7% higher in 1966 over 1965. (1)

In agriculture it was estimated that for 1964 there were 793,000 people working an average of only 174 days. (3) The indicated total was approximately 9.5% of the total population of the country; it included farm operators, hired labor and family workers. 10/

10/ In Venezuela the family farm is not an institution like it is in the U.S. This is understood because "campesinos" have been traditionally nomads, or, as many of them are now, workers of a production cooperative. Commercial farmers normally hire laborers, while the family lives away from the production unit.
An average income is not an exact measure of the well being of the agricultural group, due to the big income differences between commercial farmers and "campesinos." The estimation of per-worker income for 1957 (10) was approximately Bs. 675.0. A commission to study the fiscal system in Venezuela (21) reported that the income per income earner (normally the head of the family) in rural communities with less than 500 people for 1957 was approximately Bs. 1,500.0 per year, and for a farm family of six persons the estimation of the real income was Bs. 2,000.0 per year. These figures relate to "campesinos" income, and they are evidence of the level of subsistence that a high percentage of the population had in 1957. An estimation of average income for either commercial farmers or "campesinos" for 1966 is not available, but according to the estimates of the Central Bank (1967) the national labor remuneration to agriculture; i.e., the total remuneration to private and public agricultural workers, minus the orders paid to foreign countries for 1965, was estimated as Bs. 1.5 billion or approximately Bs. 1,600 per capita. However, because the agrarian reform in Venezuela started in 1960, the income situation for "campesinos" also started to change. It has been estimated that in seven years of the program 145,350 "campesinos" families have received land in ownership with a total area of 3.8 million hectares; the value of the
"campesinos" production has varied from approximately Bs. 80.0 million in 1960 to Bs. 600.0 million in 1967. In addition out of the 145,350 families 72% have permanent medical assistance, 61% are served with purified water, 73% receive credit assistance and 30% live in modern houses. Moreover, 43% of the land is worked with modern machinery. (33)

The manufacture industry employed 181,000 workers during 1963, with an average annual income per capita of Bs. 13,464.0. In construction there were, for 1966, a total of 217,000 persons (1) who earned a total national income of Bs. 9 billion, which becomes Bs. 4,148.0 per worker per year. This low income per worker evidences the poor economic status of the construction laborers, who, as stated before, come largely from the agricultural sector.

Data for the number of people working in the other sectors of the economy for 1965 or 1966 was not found, but estimates of the total earned in salaries and wages are presented in Table 24.

Capital Formation

1. Gross Investment. During 1966 gross capital outlays on fixed investment in Venezuela increased by Bs. 5.7 billion, compared to Bs. 5.6 billion in 1965. This means an increment of 1.3% measured at 1957 prices. (1) It was considered a very
low rate of capital outlay because the average rate in the period 1950-66 had been 3.5% per year.

The composition of the new investment during 1966 can be observed in Table 25. A comparison of these figures shows that agriculture received the largest new gross investment during 1966, followed by urban dwelling, services, transport, manufacture and petroleum. These six sectors accounted for 84.1% of the total new investment. During that year Bs. 1.7 billion out of the total investment was made by the public sector and Bs. 3.9 was invested by the private sector, but the latter showed a reduction of 1.7% in relation to 1965.


<table>
<thead>
<tr>
<th>Sector</th>
<th>Total remuneration</th>
<th>Payments to foreign countries</th>
<th>National remuneration</th>
<th>Percent of the natl. remun.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>1.461</td>
<td>.010</td>
<td>1.450</td>
<td>8.8</td>
</tr>
<tr>
<td>Mining</td>
<td>.099</td>
<td>.003</td>
<td>.096</td>
<td>.6</td>
</tr>
<tr>
<td>Petroleum</td>
<td>1.094</td>
<td>.063</td>
<td>1.031</td>
<td>6.3</td>
</tr>
<tr>
<td>Manufacture</td>
<td>2.496</td>
<td>.072</td>
<td>2.420</td>
<td>14.8</td>
</tr>
<tr>
<td>Construction</td>
<td>.987</td>
<td>.029</td>
<td>.958</td>
<td>5.8</td>
</tr>
<tr>
<td>Electricity</td>
<td>.431</td>
<td>.007</td>
<td>.424</td>
<td>2.8</td>
</tr>
<tr>
<td>Commerce</td>
<td>2.902</td>
<td>.101</td>
<td>2.801</td>
<td>17.0</td>
</tr>
<tr>
<td>Transport and communication</td>
<td>.642</td>
<td>.019</td>
<td>.623</td>
<td>3.8</td>
</tr>
<tr>
<td>Private services</td>
<td>2.984</td>
<td>.103</td>
<td>2.881</td>
<td>17.6</td>
</tr>
<tr>
<td>Public services</td>
<td>3.707</td>
<td>---</td>
<td>3.707</td>
<td>22.5</td>
</tr>
<tr>
<td>Total</td>
<td>16.799</td>
<td>.408</td>
<td>16.391</td>
<td>100.0</td>
</tr>
</tbody>
</table>


Rate of exchange: Bs. 4.50 = $1.00

<table>
<thead>
<tr>
<th>Sector</th>
<th>1964</th>
<th>1965</th>
<th>1966</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>846.0</td>
<td>16.3</td>
<td>900.0</td>
</tr>
<tr>
<td>Petroleum</td>
<td>503.0</td>
<td>9.7</td>
<td>532.0</td>
</tr>
<tr>
<td>Mining</td>
<td>83.0</td>
<td>1.6</td>
<td>82.0</td>
</tr>
<tr>
<td>Manufacture</td>
<td>674.0</td>
<td>13.0</td>
<td>777.0</td>
</tr>
<tr>
<td>Construction</td>
<td>78.0</td>
<td>1.5</td>
<td>100.0</td>
</tr>
<tr>
<td>Electricity</td>
<td>171.0</td>
<td>3.3</td>
<td>226.0</td>
</tr>
<tr>
<td>Transport</td>
<td>880.0</td>
<td>17.0</td>
<td>807.0</td>
</tr>
<tr>
<td>Communication</td>
<td>45.0</td>
<td>.9</td>
<td>49.0</td>
</tr>
<tr>
<td>Commerce</td>
<td>232.0</td>
<td>4.6</td>
<td>254.0</td>
</tr>
<tr>
<td>Services</td>
<td>665.0</td>
<td>12.8</td>
<td>744.0</td>
</tr>
<tr>
<td>Urban dwelling</td>
<td>756.0</td>
<td>14.6</td>
<td>910.0</td>
</tr>
<tr>
<td>Public administration</td>
<td>245.0</td>
<td>4.7</td>
<td>230.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,178.0</td>
<td>100.0</td>
<td>5,611.0</td>
</tr>
</tbody>
</table>

Source: B.C.V. 1966, Table VIII-1.
The amount of new investment in agriculture partially explains the rapid growth of this sector. In those preceding two years agriculture kept the second position in investment received.

The investment made in the agricultural sector during 1966 was basically in the form of construction and improvements; i.e., land clearing and leveling, irrigation, fences, houses, etc. For these purposes Bs. 460.0 million were invested which accounted for more than 50% of the new agricultural investment. Cattle accounted for Bs. 205 million, machinery and equipment Bs. 166 million and vehicles Bs. 80 million. If the total invested were separated by items in relative terms cattle would constitute 22.2% of the total, machinery, equipment and vehicles 26.7%, irrigation 14.0%, housing 15.5%, permanent trees and pasture 5.9% and all others 15.7%. (1) This means that farmers have been placing considerable emphasis on the mechanization of their farms. Although the new investment in machinery, equipment and vehicles declined by 11.7% in relation to 1965 it has still received the largest percentage of investment within the sector during 1966, as it had during the period 1960-65.

Investment made in the sub-sector food of the manufacture industry (Bs. 104.0 million), and in roads (Bs. 439.0 million) during 1966 also favored agricultural growth because one increases the market for raw materials and the other puts markets
closer to the unit of production.

New foreign investment in agriculture was not significant in 1965. The total accumulated foreign investment in this sector at that year was only Bs. 31 million against Bs. 9.3 million in 1964. The reason of this disinvestment is understood by looking at Table 26. It may be inferred 1) that the value of land is not capitalized into the agriculture sector, and 2) that the cattle included in 1964 was sold to the market.

For 1964 the foreign country with the highest investment in Venezuela was the U. S., with an estimated figure of $2.8 billion; i.e., Bs. 12.6 billion from which the 80% was reported in the petroleum sector. (17)

2) Net Investment. It was estimated that as of December 31, 1966 there was in the total economy Bs. 65.7 billion net capital invested at 1957 prices.

The items in which the total net capital has been invested in agriculture were: cattle, Bs. 4.3 billion; houses Bs. 1.3 billion, permanent plantations and pasture Bs. 1.1 billion, irrigation Bs. 1.1 billion, land clearing Bs. 1.0 billion, machinery and equipment and vehicles Bs. 1.0 billion and other construction and fences Bs. 0.82 billion. (1)

At this point it is necessary to clarify the great difference observed between gross foreign investment and total net
Table 26. Venezuela: Accumulated Gross Foreign Investment
Million of bolivares.  Ratio of exchange: Bs. 4.50 = $1.00

<table>
<thead>
<tr>
<th></th>
<th>1963</th>
<th>1964</th>
<th>1965</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross for,</td>
<td>Percent</td>
<td>Gross for,</td>
</tr>
<tr>
<td></td>
<td>investment</td>
<td></td>
<td>investment</td>
</tr>
<tr>
<td>Agriculture (cattle)</td>
<td>--</td>
<td>--</td>
<td>9.27</td>
</tr>
<tr>
<td>Petroleum</td>
<td>18,020.55</td>
<td>86.86</td>
<td>18,695.77</td>
</tr>
<tr>
<td>Mining</td>
<td>963.02</td>
<td>4.64</td>
<td>899.79</td>
</tr>
<tr>
<td>Manufacture</td>
<td>766.16</td>
<td>3.69</td>
<td>888.15</td>
</tr>
<tr>
<td>Commerce</td>
<td>569.98</td>
<td>2.75</td>
<td>705.16</td>
</tr>
<tr>
<td>Banking</td>
<td>190.66</td>
<td>.92</td>
<td>204.84</td>
</tr>
<tr>
<td>Services</td>
<td>135.91</td>
<td>.65</td>
<td>135.89</td>
</tr>
<tr>
<td>Construction</td>
<td>40.85</td>
<td>.19</td>
<td>16.58</td>
</tr>
<tr>
<td>Insurance</td>
<td>59.92</td>
<td>.30</td>
<td>59.10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,747.05</strong></td>
<td><strong>100.00</strong></td>
<td><strong>21,614.55</strong></td>
</tr>
</tbody>
</table>

investment in the petroleum sector, Table 27. The oil companies that extract, process and sell the Venezuelan oil have reduced in the last years their gross investment, while the rate of depreciation and obsolescence of their fixed assets has increased. For instance, during 1966 the gross investment in this sector showed a reduction of 5%, but the figures for depreciation and amortization showed an increment of 6.3% and consequently its net capital investment fell by 9.8%. The accumulated figure for depreciation and obsolescence was for 1964, 1965 and 1966, Bs. 12.1; Bs. 12.8; and Bs. 13.5 billion, respectively. (39, p. 139)

It is shown in Table 27 that the net increase of net capital invested during 1966 was Bs. 2.46 billion. This quantity can be taken as the value (at 1957 prices) of new net capital used in the production of goods and services by the entire economy in 1966. On the other hand, using Tables 21 and 27, it is possible to measure the gross product for each unit of capital invested by sector and by the economy as a whole.

In Table 28 can be seen that in the Venezuela economy there are large differences in the productivity among sectors. An example of low productivity is agriculture with a ratio of only .23. The other sector with lower ratio than agriculture in 1966 was transport and communication in which investment is made largely for the public sector; i.e., that it is not expected profit
Table 27. Venezuela: Net Capital Investment. Billion of bolívares at 1957 prices. Ratio of exchange: Bs. 4.5 = $1.0

<table>
<thead>
<tr>
<th></th>
<th>1964</th>
<th>1965</th>
<th>1966</th>
<th>Variation 1965-66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>9.524</td>
<td>10.105</td>
<td>10.673</td>
<td>.568</td>
</tr>
<tr>
<td>Petroleum</td>
<td>6.476</td>
<td>6.262</td>
<td>6.068</td>
<td>-.194</td>
</tr>
<tr>
<td>Mining</td>
<td>1.372</td>
<td>1.347</td>
<td>1.328</td>
<td>-.019</td>
</tr>
<tr>
<td>Manufacture</td>
<td>5.015</td>
<td>5.427</td>
<td>5.800</td>
<td>.373</td>
</tr>
<tr>
<td>Construction</td>
<td>.395</td>
<td>.433</td>
<td>.429</td>
<td>-.004</td>
</tr>
<tr>
<td>Electricity</td>
<td>2.056</td>
<td>2.200</td>
<td>2.305</td>
<td>.105</td>
</tr>
<tr>
<td>Transport</td>
<td>7.887</td>
<td>8.172</td>
<td>8.482</td>
<td>.310</td>
</tr>
<tr>
<td>Communication</td>
<td>140</td>
<td>.180</td>
<td>.261</td>
<td>.081</td>
</tr>
<tr>
<td>Commerce</td>
<td>3.856</td>
<td>3.878</td>
<td>3.878</td>
<td>---</td>
</tr>
<tr>
<td>Services</td>
<td>9.118</td>
<td>9.498</td>
<td>10.003</td>
<td>.505</td>
</tr>
<tr>
<td>Urban dwelling</td>
<td>10.012</td>
<td>10.722</td>
<td>11.401</td>
<td>.679</td>
</tr>
<tr>
<td>Public admin.</td>
<td>4.963</td>
<td>5.002</td>
<td>5.055</td>
<td>.053</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>60.814</strong></td>
<td><strong>63.226</strong></td>
<td><strong>65.683</strong></td>
<td><strong>2.457</strong></td>
</tr>
</tbody>
</table>


Table 28. Venezuela: Gross Product Per Unit of Net Capital Invested. Billion of bolívares at 1957 prices. 1966. Ratio of exchange Bs. 4.5 = $1.0

<table>
<thead>
<tr>
<th></th>
<th>Net capital for G. N. P. invest.</th>
<th>Gross produce for unit of capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>2.5</td>
<td>.23</td>
</tr>
<tr>
<td>Petroleum</td>
<td>9.2</td>
<td>1.51</td>
</tr>
<tr>
<td>Mining</td>
<td>.4</td>
<td>.30</td>
</tr>
<tr>
<td>Manufacture</td>
<td>4.5</td>
<td>.79</td>
</tr>
<tr>
<td>Construction</td>
<td>1.6</td>
<td>4.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>.8</td>
<td>.35</td>
</tr>
<tr>
<td>Commerce</td>
<td>5.6</td>
<td>1.44</td>
</tr>
<tr>
<td>Transp. and Comm.</td>
<td>1.3</td>
<td>.15</td>
</tr>
<tr>
<td>Services</td>
<td>8.7</td>
<td>.87</td>
</tr>
<tr>
<td>Urban dwelling</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>Public admin.</td>
<td>5.1</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34.8</strong></td>
<td><strong>.53</strong></td>
</tr>
</tbody>
</table>

Source: Tables 22 and 27.
maximization for the amount spent in roads and other public services.

The low rate of productivity in the mining sector is due to the fact that this industry makes initially large investments to start extraction and processing of the iron ore, but after that few, if any, new investments are made. In Venezuela these initial investments were made and like the oil industry, mining has started the process of disinvestment. So it is clear that the sector with the poorest productivity is probably agriculture, and this comes because its gross product increased at a high rate in the 1960s but also accompanied by a highly increasing rate of the net investment.

The amount of net capital invested to give employment to one person can also be obtained by dividing the amount of capital over the number of people employed in that sector. Such a ratio is called capital density and was for the agricultural sector in 1966 approximately Bs. 11,400.0. For petroleum it was Bs. 217,750.0 approximately, and for mining Bs. 390,000.0 approximately. These figures also show noticeable differences among the sectors of Venezuela's economy.
CHAPTER IV

THE MARKET FOR THE SUPPORT PRICE COMMODITIES

It is assumed that one of the purposes of the support price program in Venezuela is to increase production of the supported commodities and that the growing production of these commodities is essential for the development of the country. It is clear that agricultural prosperity for developing countries will depend on the availability of markets for their agricultural products. For this reason this chapter will try to analyze the scope of the market for the six commodities considered in this thesis. However, details of the Venezuelan market will not be discussed because it is not essential to the analysis.

Demand and Supply

The amount of these supported commodities supplied by Venezuelan farmers was analyzed through Chapter II. The demand or national requirement for these commodities however has not yet been established. The total demand or national requirement for each commodity may be estimated through the equation:

\[ D = Y + M - E + i - f \]

Where
D = total demand of a given commodity, expressed in tons.

Y = the total national production of the commodity in a given year, expressed in tons.

M = importation of the commodity in a given year, expressed in tons.

E = exportation of the commodity in a given year, expressed in tons.

i = inventory at the beginning of the year.

f = inventory at the end of the year.

It is necessary to consider the difficulties in the estimation of i and f. Inventories should reflect the quantities in the private and public warehouses, but figures for the private sector are not known. For this reason only the inventories in the B.A.P. will be considered. The procedure does not add significant error to the demand estimation because all quantities on hand are stored by the B.A.P. to keep the price at support levels. If deficits appear probable, the B.A.P. usually imports the necessary amount of the commodity and sells it to wholesalers and processors in amounts that cover the requirements of such firms until the next crop. So no large inventories are assumed in private plants and warehouses. Within these considerations, the
apparent total domestic demand for 1967 for each commodity was found to be:

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice (paddy)</td>
<td>175,739 tons*</td>
</tr>
<tr>
<td>Corn</td>
<td>661,398 tons</td>
</tr>
<tr>
<td>Black beans</td>
<td>53,481 tons</td>
</tr>
<tr>
<td>Potatoes</td>
<td>151,040 tons</td>
</tr>
<tr>
<td>Cotton</td>
<td>52,346 tons**</td>
</tr>
<tr>
<td>Sisal</td>
<td>14,060 tons***</td>
</tr>
</tbody>
</table>

* It was assumed that exported polished rice is equivalent to 1.59 the amount of paddy.
** To convert inventory in fibers to raw cotton it was assumed that 1 Kg. of raw cotton produced in average .28 Kgs. of fiber, .48 Kgs. of seeds, plus .24 Kgs. of waste materials.
*** To convert exported rope to raw fiber it was assumed that 9.5 Kgs. of fiber produced 1 Kg. of rope.

These figures of total demand do not match the estimation of the Central Planning Office of Venezuela (40), except for sisal, due to the fact that the Central Planning Office estimated the demand by taking into account only the domestic production, importation and exportation. It did not consider the effect of inventories. In this way the Central Planning Office overestimated the demand for black beans and potatoes. The estimation of the rice demand was very close to that shown here.

The demand figures show that for 1967 there was a net surplus production of 116,509 tons of rice (production minus domestic requirements) but when added to existing stocks an accumulated
surplus of 160,998 tons are indicated. In other words, the surplus was almost equal to the total consumption of one entire year. The demand for sisal also was below the national production for 1967, but allowance for inventories was not made because of the special role played by the B.A.P. in the purchase of the fiber. The total demand for potatoes was in equilibrium with the supply; this is a consequence of the role played by the potato growers cooperatives in the control of production. The other commodities presented a demand larger than the domestic supply, especially in the case of black beans.

The increase in production of almost all the supported commodities has meant a saving in foreign exchange of noticeable magnitude. For 1950 approximately 36% of the food consumed in Venezuela was imported. By 1967 only 8% of the food consumed was not produced in the country (37). In the case of rice the foreign exchange saved in 1967, in relation to 1958, was Bs. 12.8 million. Although Venezuela still imports corn, the saving of foreign exchange has increased substantially. But in 1964, due to increase in demand (new processing industries) and overestimation of such an increase, corn imports were the highest in Venezuela's history. The corrected values of the effective need in 1964 and in 1965 indicate a figure of about Bs. 20.0 million saved annually. The amount of corn imported
in 1967 was only Bs. 234 million, an amount which indicates corn imports may be entirely eliminated in the current year. In potatoes the amount of foreign exchange saved in 1967 in relation to 1958 was only Bs. 1.7 million. For sisal it is not possible to make this estimation because importations were made in final products but not the fiber. In relation to black beans it was found that the outflow of foreign exchange has increased due to declines in production. In effect, the value of imported black beans in 1967 was Bs. 21.8 million, one of the highest figures recorded for importation of this commodity. This amount was surpassed only by the 1958 figure, which was Bs. 27.6 million. However, importation before 1958 was in the neighborhood of Bs. 16.0 million which meant an increase in 1967 of only Bs. 5.8 million. Cotton production represented a saving of about Bs. 15.0 million in 1967, although during the 1960s a trend to increase importation is observed.

All this shows that the increasing production of the supported commodities has furnished saving in foreign exchange during 1967 of approximately Bs. 42.7 million, with allowance made for the increase in black beans importation.

In general the Venezuela exportation of agricultural commodities for 1966 and 1967 has accounted for Bs. 149.7 million and Bs. 169.5 million, respectively. Basically these figures
have been formed by the vegetable sub-sector which has furnished 91.8% and 86.4%, respectively, of the total value of agricultural commodities exported. The principal commodities that have contributed the most to these figures are coffee, cocoa, sugar, tobacco, plantain, seed, flowers, tropical fruits, and other horticultural products. Following this sub-sector it was found that the second largest contribution to exportation has been the fishery sub-sector.

In contrast to exportations the amount of imported agricultural commodities had a value of Bs. 431.9 million and Bs. 486.0 million for 1966 and 1967, respectively, composed of a high proportion of vegetable products. For the two years, the vegetable sub-sector accounted for 84.2% and 85.4% of the total importation of food, respectively. The commodities that were most heavily imported were wheat (approximately 45% of the total value imported), copra, feed (no cereals), black beans, cantaloupes and soy bean. From the other sub-sectors the most important food imported based on value was meat. (33, p. 435-442)

Knowing the national requirements for these commodities and supply of them, and having found increasing surplus in only one of these commodities but possibilities of surplus in two others, it is necessary to know the influence of variation in price on the demand for these commodities. However, studies about price elasticity have not been completed for all the agricultural
commodities in Venezuela, so it is not possible to present a complete picture for all of the six commodities analyzed.

According to a survey made in 1962 the following price and income elasticities for four of the supported commodities was found to exist.

Table 29. Venezuela: Price Elasticity of Demand and Income Elasticities for Selected Commodities, 1962

<table>
<thead>
<tr>
<th>Commodities</th>
<th>Price elasticity Rural</th>
<th>Price elasticity Urban</th>
<th>Income elasticity Rural</th>
<th>Income elasticity Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice (milled)</td>
<td>-.30</td>
<td>-.22</td>
<td>.19</td>
<td>.12</td>
</tr>
<tr>
<td>Corn and corn prod.</td>
<td>-.61</td>
<td>-.62</td>
<td>.13</td>
<td>.03</td>
</tr>
<tr>
<td>Potatoes</td>
<td>-.30</td>
<td>-.56</td>
<td>.18</td>
<td>.24</td>
</tr>
<tr>
<td>Black beans</td>
<td>-.07</td>
<td>-.14</td>
<td>.11</td>
<td>.06</td>
</tr>
</tbody>
</table>

Source: U.S. Dept. of Agriculture Long Term Forecasts of the Supply and Demand of Agricultural and Livestock Products in Venezuela. Table 9, p. 33.

So it is expected that with a decrease of 10% in the rice price at the consumer level, its demand expands in rural areas by 3% and in the urban area by 2.2%. If it is assumed that the price elasticity of demand for rice for the Venezuela economy as a whole is -.25, a reduction of 10% of the price at consumer level would mean an expansion in demand of 2.5% which in absolute terms would mean Kg. 2.59 million approximately, over the actual demand, other things being equal. **11/** This explains why the B.A.P. failed to

**11/** The actual demand of milled rice was estimated 103.7 million kilograms.
significantly offset the demand for rice when in 1966 it decided to sell polished rice at lower price in the public markets.

An upward movement in rice price of the same magnitude would mean theoretically a decline in the quantity purchased of only 2.59 million kilograms. This is in theory because the cross elasticity of the commodity has to be taken into account. Unfortunately, studies about cross elasticities have not been made for this commodity and its possible substitutes. In general the four analyzed commodities have inelastic price elasticities but variation in prices would affect the demand of corn and corn products more than the others. On the other hand, variations in the family income would affect most the demand for rice in rural areas and the demand for potatoes in urban areas.

The same survey showed that for the whole agricultural sector, the highest price elasticities of demand in the rural areas were: -.84 for eggs, and -.80 for pasteurized milk, whereas for urban areas they were -.96 for noncentrifugal sugar and -.77 for cassava. The highest income elasticities were .40 for pasteurized milk and .30 for plantain in the rural areas, while in the urban areas the highest figure was .34 for pasteurized milk and butter. These facts seem to indicate that increase in demand depends more on population increases than on other variables.
The food expenditures for the total economy was found to be distributed in 1962, as follows: 29.8% for meat and eggs; 18% for milk and milk products; 17.2% for grains and grain products; 10.5% for coffee, cocoa and cigarettes; 7.0% for fats and oils; 5.0% for sugar; 4.4% for pulses; 43% for bananas and plantains, and 3.8% for other starches. (9)

Processing and Other Costs for Supported Surplus Commodities

Although among the analyzed supported commodities only one has presented surpluses, it is necessary to examine these costs in order to get approximate figures for the treatment of possible surpluses of other commodities in the future.

One of the costs that must be added to the support price program is the transportation of the "campesinos" crop from the village where farms are located to the nearest public warehouse and the subsequent process to reduce the moisture of such commodities, both of which are paid by the government in addition to price supports. The B.A.P. does not have accurate figures of these costs although it is known that the drying of cereals has a cost of Bs. .02/Kg. but normally a record of the production of "campesinos" has not been kept separate. For the transportation of grains, a figure of Bs. 1.50/100 Kgs. has been estimated. This figure may look high but it is necessary to consider that
"campesinos" farms and settlements are not located near large cities served by good roads and consequently transportation cost is high. These two costs should be included in the total cost of the commodities processed by the B.A.P.

The other costs to be added to these commodities is storage. In 1961 the B.A.P. founded a corporation with the purpose of passing to it all its warehouses and silos in order to get certificates of deposit, but because that is a corporation the B.A.P. has to pay, as any other client, for using its former installations and any new ones the bank may build in the future. The tariff charged by that corporation to the Agricultural and Livestock Bank "B.A.P" is calculated by weeks or fraction thereof in a scale from Bs. .10/100 Kgs. to Bs. .25/100 Kgs. according to the commodity. Potatoes is subject to a special tariff as well as any other commodity that may need refrigeration. When the commodity is stored in sisal or jute bags, the bags are another direct additional cost for the B.A.P.

Rice is the commodity that the B.A.P. has analyzed in more detail because it is the only one in the group of supported commodities that has been exported regularly in recent years. It was estimated (31, p. 269) by the B.A.P. that the cost of rice at the warehouse should be calculated according to the following figures per 100 Kgs.
<table>
<thead>
<tr>
<th>Cost (support price)</th>
<th>Bs. 60.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of sisal bags (2)</td>
<td>.80</td>
</tr>
<tr>
<td>Average storage cost</td>
<td>2.60</td>
</tr>
<tr>
<td>Average transportation</td>
<td>1.50</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Bs. 65.50</strong></td>
</tr>
</tbody>
</table>

If the rice is going to be exported, to the former figure it is necessary to add: (27)

<table>
<thead>
<tr>
<th>Cost of 100 Kg. at the warehouse</th>
<th>Bs. 65.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation to the harbor</td>
<td>4.00</td>
</tr>
<tr>
<td>Trade of carriers</td>
<td>.60</td>
</tr>
<tr>
<td>Stowing</td>
<td>.60</td>
</tr>
<tr>
<td>Commission (1% ad valorem)</td>
<td>.66</td>
</tr>
<tr>
<td>Other expenditures</td>
<td>.32</td>
</tr>
<tr>
<td>Unexpected expenditures (1% over previous cost)</td>
<td>.71</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Bs. 72.39</strong></td>
</tr>
</tbody>
</table>

When the rice to be exported is polished these costs change according to the mix with broken kernels. Venezuela has usually exported four different kinds of polished rice: with 20%, 25%, 30% and 40% of broken kernels, although brown or any desirable mixture can be exported. The variety exported has always been a long grain. The cost of this polished rice has been estimated to be as shown in Table 30.

Under actual conditions if corn were to be exported the cost at the mill for the B.A.P. would be approximately Bs. 45.50/100 Kgs. and at the port it would be Bs. 51.99/100 Kgs.
Table 30. Venezuela: Approximate Cost of 100 Kgs. of Polished Rice, Alongside the Mill and at the Port. In bolivares.

<table>
<thead>
<tr>
<th>Percent of broken kernels</th>
<th>Cost at the mill</th>
<th>Cost at the port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polished rice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>124.36</td>
<td>133.58</td>
</tr>
<tr>
<td>25</td>
<td>122.62</td>
<td>129.88</td>
</tr>
<tr>
<td>30</td>
<td>117.89</td>
<td>125.05</td>
</tr>
<tr>
<td>40</td>
<td>108.42</td>
<td>115.64</td>
</tr>
</tbody>
</table>

Source: B.A.P. correspondence to the author.

The International Market for Venezuelan Price Supported Agricultural Commodities

Although Venezuela is a traditional coffee and cocoa exporter it has not had extensive experience in the exportation of any of the price supported commodities. It is felt that due to the international deterioration of coffee and cocoa prices and due to the principle of comparative advantage, Venezuela should try to export other agricultural commodities, with more advantage in the international market than coffee and cocoa, and at the same time to try to produce imported goods or their substitutes (16). This is what Venezuela has been doing during the 1960s. Coffee and cocoa production, because of low world prices and other domestic reasons, has stagnated as was shown in Chapter II. But the production of other commodities has been expanded to try
to replace coffee and cocoa as exportable agricultural crops. Now, because such expansion in production has been achieved through large public credit programs and support prices established over the international price, international trade restrictions have developed to avoid the invasion of the same commodities from abroad. Referring to this common situation in international trade, the U. S. Department of Agriculture (4) has said that as a consequence the domestic situation normally turns out to be an incentive to surplus production. Interpreting the situation in this way and considering this procedure inconsistent with international trade, the U.S.D.A. decided in 1964 to reduce the support price level on certain crops. (22)

Venezuela's exportation of new agricultural commodities has not been under stable rules. On the contrary, as in the case of rice, these rules have changed before each new export year. This seems to be a consequence of trade-oriented production instead of domestic market orientation.

It is difficult to give an exact figure for prices in the world market for all the supported commodities because prices change continually and because there are many different qualities and varieties in the market. For example, at least three different standard grades of white and yellow corn can be found in the U. S. market. Furthermore, prices vary according to location.
Nevertheless, some figures are available.

The wholesale price of rice in Thailand, the largest rice exporter in the world, for paddy No. 1 Na-Suam delivered alongside mills was an average during 1965 $0.042/Kg., i.e., Bs. 189.00/ton. Because this price looks too low, it is assumed the largest amount of that paddy was short grain varieties. Milled rice Zenith No. 2 had a wholesale price in New Orleans, Louisiana, for the same year, of $.184/Kg., i.e., Bs. 828.00/ton. The Thailand export price for milled rice f.o.b. Bangkok with 5% to 7% broken kernels was $.137/Kg. or Bs. 616.50/ton. Potatoes No. 1 had a price of $.103/Kg. St. John, Canada, and $.111/Kg. in New York, i.e., Bs. 463.5/ton and Bs. 499.5/ton, respectively, both observed in 1965. Corn, yellow No. 3, Chicago, had a wholesale price of $.05 Kg., i.e., Bs. 225.0/ton. (25, p. 523, 526, 535)

Although the wholesale price may not be the export price, all depending on the trade custom in each country, they are the closest approximation to export prices, although normally a little higher than the world market price. World prices probably have declined recently in relation to 1965, especially for grains. For example, on July 31, 1968, the Chicago cash price for yellow No. 2 corn was $1.08 per bushel or approximately $.03/Kg. (2)

During 1966 the B.A.P. sold 19,657 tons of paddy to Italy
at a price of Bs. .2867/Kg. In the same year it also sold 15,819 tons of brown rice at Bs. .437/Kg. but its cost f. o. b. was Bs. 1.02/Kg, and 11,036 tons of polished rice were sold at Bs. .5396/Kg. when its cost f. o. b. Venezuela was Bs. 1.1546/Kg. During 1967 another exportation of polished rice of about 63,118 tons was made at a price of Bs. .586/Kg. (30, p. 29).

The Venezuelan procedure to export rice consists of opening at auction samples to show the quantity and quality of the product, and the requirements the prospective purchasers must fulfill. Because sealed envelopes with the propositions are asked for and opened at a public meeting, the B. A. P. must choose the best proposition if the prospective buyer has fulfilled all the requisites asked by the B. A. P. In one auction called on March 28, 1968, and opened on April 5, to sell 60,000 tons of polished rice, or its equivalent in paddy, the B. A. P. received propositions which would mean a subsidy, according to the best proposition of Bs. .408/Kg. (32)

It is important to observe that the amount of subsidy per kilogram exported varied in the period 1966-1967 from Bs. .71/Kg. to Bs. .41/Kg. --a difference of Bs. .30/Kg., which has to be considered too high to be imputed to supply and demand forces only. It may be explained by deficiencies in the domestic market.
In the case of corn, a commodity that is still partially imported but in very small figures, it was found that world prices were Bs. .225/Kg. against Bs. .52/Kg. f. o. b. Venezuela.
CHAPTER V

THE PRICE SUPPORT PROBLEMS IN DETAIL AND THE DISPOSITION OF AGRICULTURAL SURPLUS

The Problems

The analysis here will deal with those problems enumerated in Chapter I but not treated in detail, in order to complete the consideration of the Venezuelan price support program and its consequences for agricultural development. The problems are:

1. Public Difficulties in Changing the Trend of Production of the Supported Commodities.

It can be observed that decrease of the support price level has not occurred for rice or any near surplus commodity, even considering that the world market price is very low in comparison to domestic prices. The public action to change the trend of production for supported commodities has been centered mainly on variations of the amount of public credit for the cultivation of a given commodity, or variations in the rules for purchasing the crops from farmers. The reduction of credit has not worked because its application has found hard opposition from producers. Rice growers, for example, have usually kept a deficit balance with the B. A. P. and have attacked any proposal of the bank to
decrease the credit volume for this commodity, using the argument that less acreage cultivated would mean lower returns to farmers making it impossible for them to pay their obligations. Changes in the rules to receive the crop by the B.A.P. have also been opposed successfully by farmers. For example, new rules about rice classification published prior to land preparation for the 1964 rainy season crop were suspended the day following publication due to pressure from farmers and their associations. The opposition of farmers to such modifications can be explained by their lack of know-how and general reluctance to switch from production of one commodity to another, or by the vulnerability of the support price program and agricultural policy as a whole due to lack of clear and measurable goals.

2. Storage.

On December 31, 1966 there was in public warehouses and silos rice enough to cover the total domestic demand for almost one year. If exportation had not been made, the rice stored would have been approximately 270,000 tons at the end of 1967, or nearly the total installed storage capacity controlled by the government that year for all farm products. This problem of lack of storage began when rice production surpassed the domestic consumption while public storage capacity within the sector remained the same as it had been for the last 15 years. For 1965
it was necessary to initiate the construction of new public silos with capacity for 202,000 tons. During 1966 and 1967 silos with a total capacity of 155,000 tons were completed and the construction of others with 47,000 tons capacity and warehouses with 10,000 tons capacity to store potatoes were started. When the program of construction is completed the total public capacity for agricultural commodities will be 414,000 tons. To finance this construction during 1966 and 1967 the B.A.P. spent approximately Bs. 45.00 million. (31)

The new silos have not solved the storage problem completely. The available 207,000 tons of storage capacity in 1965 was old warehouses and silos, with many inefficiencies. In addition, the personnel in charge of the public silos are not entirely qualified. These two problems are reflected in an increasing rate of damaged products due to insect attacks and excess heat. (30)

Although the public expenditures for silos and warehouses have been necessary to carry out the support price program, consideration has not been given to the possibility of storing the supported commodities at commercial farm warehouses. This procedure would reduce the cost of the program (assuming low administrative costs) and contribute to the education of the farmers about conservation of their products. According to the actual rules, the support price program cannot operate efficiently if enough
public storage capacity is not available. This means increasing public expenditures in fixed assets and administrative costs while production is increasing.

3. Financing.

During the period 1961-1967 the federal government's contribution to farm credit varied between Bs. 100.00 million ($22.2 million) in 1963 to Bs. 212.00 million ($47.1 million) in 1965. (37) Because the B.A.P. also uses its own resources, the total amount of money loaned generally has been in the neighborhood of twice the government allocation, but still far short of the total credit needs. In 1967 the B.A.P. satisfied only 47.9% of the commercial farmers credit demand and 57.7% of the "campesinos" credit demand. In other words, the B.A.P. satisfied only 61.6% of the total credit demand. Part of the unfilled demand corresponded to denied loans due to delinquency of the borrowers with the bank or too high risks in the recapture of the money, but the largest part was explained by lack of loan funds as has been recognized by the institution (27). If there is lack of resources in meeting the credit demand and on the other hand the B.A.P. immobilizes its own loan resources by having them invested in surplus agricultural commodities and in subsidized exportations, it is clear that its ability to increase the outflow of loans will decrease. This will be true even if it gets
certificates of deposit from the Central Bank or foreign commercial banks, because these certificates of deposit are issued for only 80% of the support price level. Besides this 20% reduction of monetary funds for administration, maintenance and insurance costs and the shrinkage of the commodities stores also must be subtracted. The shortage of financing funds is more serious when one considers the increasing demand for such funds which grows every year more than the economic capacity of the B.A.P. to meet the demand.

4. Allocation of Resources.

Prior to the discussion of the allocation of resources it is necessary to analyze the characteristics of farm management in Venezuela.

Some commercial farmers and economists have already noticed that everything is not going well in farm management in Venezuela (3, 41). There also has been evidence throughout this thesis that some of the deficiencies of Venezuelan agriculture depend more upon poor management than inherent conditions of the other three factors of production. Nevertheless, it is necessary to keep in mind that Venezuela has two different kinds of producers. It is not possible to ask for more efficiency from "campesinos" right now, because they were operating until recently a traditional agriculture in which availability of
resources to modernize their method of production was almost nil. "Campesinos" started a process of learning in 1958 and only throughout the period of one generation, at least, would it be reasonable to expect significant changes in their behavior and cultural practices. The case of commercial farmers is a different one. The learning process of these farmers should be more advanced than the learning process of "campesinos" because commercial farmers have had public aid since 1928 when the B.A.P. was created to serve only them. It is true that commercial farmers produce 78% of the agricultural gross product, but it is also true that it is produced with large inefficiencies imputable to the poor performance of commercial farmers as farm managers. Throughout the B.A.P. experience the following characteristics of the management function have been observed: a) It is not a general practice to have soil analysis of the farm they own. The fact that the agriculture ministry does not have a complete soil classification of the country cannot be accepted as an excuse for this fundamental requisite. b) It is not a general practice to record the yield for the application of different combinations and amounts of fertilizers in order to detect the best combination in a given soil. Because of the lack of soil classification, general research in this area is scarce. c) Not enough attention is paid to data related to weather. Although this may not be an
important factor in a country that has only two seasons, few
statistics exist about the length of the rainy and dry seasons
and the variabilities by region. d) Few farmers have a topo-
ographical map of their farm which would permit planning a good
irrigation system. e) Not even economists have used marginal
analysis for the allocation of resources to the different enter-
prises of the farms. f) Accounting is a procedure that has
started to be used recently because it is a requirement to get
loans from the B. A. P. But this accounting system does not
reflect all the information the farmers should have for making
decisions and, in many cases, information is altered in order
to give a more favorable economic result and get the loan with
less difficulty. For this reason, accounting is of poor utility
to many farmers for accurate analysis of their economic situation.
Moreover, accounting records are usually made by third persons
or firms and the farmer normally does not know how to interpret
the information. g) Cost analysis, amortization and discount
rates and contribution of each input to the gross product of the
farm are variables usually ignored by the farmers. h) Oppor-
tunity costs do not play an important role in the management
decision of the majority of the Venezuelan farmers. i) Few
farmers, if any, make economic analysis of the incidence and con-
trol of pests. j) The most sophisticated analysis that some
commercial farmers do when they need a new loan is an investment plan. It is a description of how the money is going to be used, but does not reflect the returns on this investment, and the results are usually not compared with the plan.

In light of these deficiencies present in the farm management function of a large majority of Venezuelan commercial farms, the decision-making process should be expected to be slow and consequently the farm as a business not expected to achieve its highest possible return. To make their decisions, farmers wait for the government to develop a plan and then engage in it if they see in it an easy business. Once they are engaged in that plan, say the production of a commodity, it is difficult for farmers to get out because of resource fixity. Decision about what commodity to increase or what commodity to introduce into the market is a public function in the actual situation. The farmers have only the previous year's market price and the current support price to guide them in their decision making. They await their neighbor's entry into an enterprise and see whether or not it is successful. After that, almost all of them decide identically to enter or reject the new enterprise. If they engage in the same business, few of them are inclined to make modifications in order to increase yields.

Production is said to be efficiently organized in a
competitive market when the marginal value of product obtained from the addition of an additional unit of input is equal to the cost of that marginal input; i.e., \( \text{MVP} = \text{MIC} \). It has also been accepted by economists that the best guide to resource allocation in agriculture are price and rent of the land, taking into account the period or periods of production involved and the discount rate \((7, 11, 12, 15, 20)\). In accord with this, it should be expected that available resources would be invested in those commodities that pay the highest marginal return.

It has been mentioned throughout this thesis that Venezuelan agriculture produces surpluses in some commodities and deficits in others. This is true even within the narrow group of supported commodities. Evidence of clear misallocation of resources is seen in the average return for rice which is below its direct cost whereas for black beans the reverse is true.

Professor Schulz (19) has shown the factor that explains the misallocation of resources in developing countries. He says that in South America the policy of import substitution has made agricultural inputs more expensive. He also found low investment opportunities in the agricultural sector, low prices for agricultural commodities in the domestic market, inadequate investment in human resources, and lack of adapted new inputs due to underfinanced and understaffed experiment stations. However,
these factors do not seem to explain entirely the misallocation of resources in Venezuelan agriculture. Although import substitution has made some commodities more expensive than when they were imported, e.g., vehicles, other commodities have decreased in price, e.g., fertilizers. Factors which have increased the imported input prices in general include mainly the bolívar devaluation in 1961, the excessive charge for market service made by dealers and the unjustified upward movement in prices of the protected manufactures. On the other hand, the public investment has offset the lack of private investment in agriculture, as was shown in Chapter III. It was also shown that prices are not low in the domestic market but sometimes twice the world price, due to the support price program. Investment in human resources has been very high as indicated by the fact that in 1966, 20.6% of the national budget was dedicated to education and health (1). However, college education leading to an agricultural career is scarce. Probably the only reason that fully applies to the Venezuela case is the lack of research which is a consequence of the understaffed and underfinanced experiment stations. But it is difficult to explain misallocation of resources through this factor alone.

Professor Hathaway (6) adds another factor saying that allocation of resources is also affected by excessive liquidity
or by internal capital rationing. According to this, farmers should maintain an adequate degree of liquidity to allow flexibility in facing uncertainties. But the Venezuelan marginal propensity to save is low because the population does not have a strong saving habit. It may thus be inferred that the farmers' degree of liquidity is too low. This is also evidenced through analysis of the B.A.P. borrowers. Every year they ask for loans of the same or larger amount than the one they received the previous year. This implies that farmers have a large dependence on public credit. The low propensity to save in the agricultural sector can also be explained by the low return on the majority of the commodities; i.e., the propensity to consume absorbs entirely the small revenues of the farmers.

A measure of efficiency is given at the highest profit combination by dividing the net return at the H.P.C. by the capacity of the fixed factor. Capacity is defined as the ability to receive a number of units of variable inputs (8). Such an efficiency measure is interpreted as the return above total cost of the variable input for each unit of such input. This measure is obtained using marginal analysis, but because Venezuelan farmers do not have the necessary data to do this analysis, it is not possible at this time to determine the level of efficiency for individual growers. Another approach within the same method could be to
determine in which direction the relation MV=P = MIC has varied. Because of the bolivar devaluation in 1961 and other reasons, to keep the equilibrium of the agricultural sector would require increased output at constant market prices or increased price of the product at constant yield, or increases in both. It has been shown that support prices, although high, have increased very little since 1961 and yield also has stayed almost static. So efficiency between 1961 and 1967 should have necessarily decreased. This is more nearly true in the rice case than in other supported commodities, because, while the rice support price has remained at Bs. 60/Kg., the support price for the other commodities has increased a little, except for potatoes whose prices change according to the variety cultivated.

The rice case can be taken to corroborate the preceding statement about decision making. Many people, even nonfarmers, moved into rice culture because they saw some farmers were achieving a crop that was supposed to be very profitable. They invested in machinery, land, etc. and those that have not been successful have their investment trapped and unable to move to another enterprise because they lack know-how. These two elements seem to be important factors in explaining the mis-allocation of resources in rice culture. Because the support prices and the relative level of public credit participation in rice
production have remained almost unchanged and since they are the most reliable guides farmers have in making their decision, it can be said that they have contributed to maintaining this situation of misallocation of resources.

The misallocation of resources to black beans where low production is found in combination with higher returns than in rice production, may be explained by the trapped resources in rice production which cannot move into this commodity and the lack of know-how to develop this business.

Evidently one of the most misallocated resources is land because it has been increasing but without increasing yields. Capital seems to be the second most misallocated factor because, as it was seen in Chapter II, the highest association with land increase was found in support prices and credit.

It seems that the reallocation of resources can be helped through public credit and support price policy. These can be used as a means to achieve, in the short run, some degree of efficiency. However, in the long run, the extension service should play a very important role in the formation of farm managers because very little can be done to increase efficiency if farmers do not know how to make and carry out decisions.

In the rice case the B.A.P. financed during 1966, 55.4% of the national production, in 1965 the proportion was 48.6% and in
1964 was 65%. It shows that a reduction of the amount of credit to this commodity will reduce the national production and consequently the surplus. Although this sounds simple, it was explained that this procedure does not work, at least under present conditions. On the other hand, reduction of the support price could also induce reduction in the hectares sown, but it was also explained why there is opposition to this measure. A similar explanation could be given for corn or potatoes in the future if production continues to increase at present rates. The black beans problem could be approached through an increase in credit because it seems the support price is high enough to provide a fair return over direct costs. A major problem may arise because of the lack of resources to maintain the actual rate of investment in the present and future surplus commodities and also increase it in the deficit commodities. Lack of resources includes the human factor and technology, but these factors have to be corrected in the long run. Better allocation of resources for the supported commodities can also be achieved through division of the market for each of them, depending on the possibility of doing so and on the elasticities of these commodities in the different markets.
5. Unclearness of the Philosophy of the Support Price Program in Venezuela

The discussion of the objectives presented to justify the support price program indicate contradiction among some of the objectives and even within some of the individual objectives. Analyzed in the same order as in Chapter I, it is observed that: a) The support price program is ambiguous when it attempts to guarantee a "fair profit." The program should guarantee only a market and a price based on determined goal. To try to find what is or is not "fair profit" may involve the program in subjective interpretations and undermine it with meaningless interpretations. b) The objective of avoiding low prices during harvesting, is acceptable because support prices are generally far above the market clearing price at harvest time. But it does not mean that, as a consequence, production should increase, which is the interpretation shown in Chapter I. A clear example is black beans for which, despite support price, production has decreased. It is also necessary to consider that low seasonal prices at the producer level may remain, even with support prices, if producers find that they do not receive payment from the B.A.P. immediately after they have delivered the commodities or when farmers find it possible to be delinquent with the B.A.P. without serious punishment.

Objectives "a" and "b" are in contradiction in trying to assure increasing production and at the same time "fair profits".
Increasing production may put a ceiling on the program and when this limit is surpassed prices at producer level may decrease.

This has been the purpose of some policies in the U. S. such as acreage allotment, marketing quotas, direct supply control programs, etc.  

c) The objective of assuring a price and a market only for B. A. P borrowers would have meant the negation of objectives "a" and "b" and the conversion in a crisis of the financing program mentioned before because the B. A. P. must be in condition to meet the demands for loans of all the qualified borrowers.

d) The belief that support prices should change according to production seems to be a defensible policy but the actual experience in Venezuela has been a different one. Significant change in the scale of the support price program has not been recorded within the period 1961-1967. Changes that can be classified as significant are the conversion of the geographical scale in corn support price to a uniform price in all the country in 1964; the increase in the black beans support price from Bs. 1.10/Kg. to Bs. 1.25/Kg. in 1966 and the conversion during 1966 from the uniform price of rice to a scale that varies according to the length of the kernel from Bs. .50/Kg. to Bs. .60/Kg.

This last modification is an attempt to shift rice production from short grain varieties to long grain ones. However, application of the modification in the rice support price has had its
problems. During 1966, because of special conditions of the crop, concessions were made to farmers in the grading of rice. As a consequence the price almost remained at its former level. This objective contradicts objectives "a" and "b". e) The fact that support prices are based on standard grading does not mean that yield should increase as was assumed by the policymakers. This erroneous belief is evidenced throughout the six analyzed commodities. f) The statement that support prices would give stability and at the same time increase farmers' incomes are redundant. It would contradict objectives "a", "b", and "d".

On the other hand, the purpose of a support price program cannot be adequately stated in a broad way such as to "increase farmers' income."

The failure of government to adjust support prices to market supply conditions does not conform to expressed guidelines or elementary economic principles. Increasing production of rice has occurred year after year without effective government intervention to shift production patterns through price support changes.

The beliefs and values presented have not defined the support price program in Venezuela, but instead tell us that the points of view of the policymakers have been ones of response to complication found in the agricultural sector. For this reason, it appears the consequences have generated the statement rather than the
Possible Disposition of the Agricultural Surpluses

If the level of agricultural production remains constant; i.e., if no technological changes increase the yield for the supported commodities, Venezuela will continue in the short run with surplus in only one supported commodity (rice). In the intermediate run it might have surplus in two others (corn and potatoes). But if modernization of agriculture is supplemented with an extension service program to improve management and technology, it is expected that surplus commodities will increase in number because of increasing yield. Because these adjustments are necessary to make agriculture a remunerative business, there has to be found some alternatives for the disposition of such surplus.

The demand for agricultural commodities may be affected through three different methods. a) Price supports which provide for producers a completely horizontal demand curve at the support price level. b) Market discrimination programs which may be achieved through marketing quotas for the principal market, and c) Demand expansion programs in which exportation of surpluses (commercial and noncommercial), milk, lunch and stamp programs are used, as in the U.S.
Since the price support program has been analyzed in detail in the preceding chapters of this thesis, the objective here will be to deal with some alternatives for disposing of actual and possible future surpluses of supported agricultural commodities.

It was seen that the supported commodities in Venezuela have inelastic demands, so a decrease in price will not increase substantially the disposition of surpluses of these commodities. However, it was also seen that Venezuela has diet-quality problems which may be partially explained by income mal-distribution. It has been estimated (23) that 50% of the population shared only 10% of total personal income in 1957; 5% shared 30.5% of the total personal income, and 45% the rest. So it may be assumed that a food stamp program which would provide low income families with a better diet would increase demand somewhat. Nevertheless, the purpose of increasing the rice demand alone cannot solve the problem because it has been shown by the F.A.O. (26) that polished rice does not provide needed vitamins to people unless it is treated with niacin, riboflavin and thiamine recommended as a daily food requirement. A similar problem is faced with corn but it does not have the serious disadvantage rice has. Hence, a program of this kind might include, in addition to enriched polished rice, corn flour, potatoes, black beans, milk, plantains, and meat.
Other programs to enhance demand and to create good food habits might also be developed. Nevertheless, the expected direct domestic demand increase would not be enough to solve the surplus problem without exceedingly heavy subsidization. On the other hand, in case that all the supported commodities could increase their yield substantially, the demand for fiber would need to be increased also. Thus different alternatives must be found.

The domestic market for agricultural products in Venezuela has not changed substantially throughout time. Consumption of many foods is still identical to that of earlier years; i.e., diversification in consumption or use of agricultural commodities has not expanded except in the case of corn. For this reason it would be difficult to enhance the domestic market. Sales promotion does not seem to be the most productive way because the Venezuelan farm cooperatives are not totally prepared to face the task by themselves and because sales promotion of agricultural commodities often has not been successful in shifting upward the demand curve of these commodities.

It seems possible to develop some programs of market discrimination to try to solve the surplus problem and at the same time bring incentives to manufacturing development and indirectly to create the necessity of improving farm management. It is thought that a market discrimination program can be very useful
if it is started before the disequilibrium in agricultural production reaches large proportions. Because they require at least two different markets with different elasticities, such programs would need careful study before application.

In the case of rice, at least three different markets can be observed: a) The direct consumption market, which was estimated to be 175,739 tons in 1967. b) The bakery market. Several studies have been made by the Venezuelan government to use part of the rice surplus to obtain rice flour and mix it up to 10% maximum with wheat flour used in the preparation of bread. The tests have shown that the rice flour does not change the flavor of the bread but its quality is improved because the loaf remains fresh for many hours more than pure wheat flour bread. Wheat flour importations or flour processed from imported wheat may be estimated on the average to be 300,000 tons (33), so the substitution of 10% rice flour for wheat flour would mean the use of approximately 40,000 tons of paddy. Although this would be an important market adverse opinion has not allowed this upward shift in demand to proceed. Some people believe that such a policy would increase the bread price, which has remained static for many years. It is true that there is a price difference between the rice flour and the wheat flour favoring the latter, but the policymakers have failed to realize that: 1) The highest quality rice
would not be used for flour so that which is used will have a lower price, and 2) that it is necessary to create a market discrimination program. This program would assign to each producer (excluding "campesinos 12/) a share of the market based on his production in several previous years, and such a quantity should be paid for at the support price level. From his surplus production one portion would be diverted to the bakery industry to cover that 10% of the substituted wheat, at a price equal to the price of imported wheat flour or that obtained from imported wheat for human consumption, and the last part of the crop would be sold at a price of the third market to be discussed below. This policy would keep the bread price static, even with better quality, which could be improved still more by adding vitamins to it, or the price of bread could be increased according to the quality added but not due to the rice cost. Producers would be persuaded to use better technology and management on their farms, and hence farms would become more efficient units. At the same time, some foreign exchange could be saved and the public subsidy could be decreased. c) The third market would be commercial exportations. It was shown that the world price of rice is very low in comparison to the Venezuelan support price. The government has to pay an increasing subsidy for exportation as production increases. This third market would

12/ The exclusion of "campesinos" owes to the fact that they must be subsidized for a long period.
require a price lower than the price in market two, which could be shared in equal proportions by the government and farmers. That price could be estimated as the average price in three international markets at a given time of the year. This procedure would permit farmers to receive the complete payment of their crops when they sell it to the B.A.P. This market discrimination program would limit the number of rice growers to some "campesinos", who will receive payment according to the actual rules of the B.A.P. and will continue producing under government agency supervision, and the most efficient commercial farmers. On the other hand, as Professor Hathaway (6) says, market discrimination programs create difficulties for new resources coming into production because they will face a marginal return determined by the marginal value of product in the lowest price market.

For corn, the market could be divided into two segments, one which is the corn for human consumption which can be paid for at the support price level, and the other market for livestock feed. Actually, there is no reason for this policy because there is not a surplus, and even if in 1968 it is possible to satisfy the domestic demand with the national production, it is also necessary to establish a policy of reserve for agricultural commodities to cushion any emergency due to irregular variations. On the other
hand, it is possible to find substitute grains to feed livestock with prices lower than corn. But because the development of those other commodities is still in their first stage, corn may share part of this secondary market. Since the corn that is used for feeding livestock does not include the corn plant but only the grain, there is a cost of harvesting and processing that could be reduced if both plants and ears of corn are processed together on the same farm or in the same area to avoid transportation costs for the bulky raw material.

Cotton has as its principal market the clothing industry and as secondary ones the pharmacy and foreign markets, in addition to the oil market for cottonseed. Long fiber cotton is still partially imported, so in the short run Venezuela may not expect surpluses in this commodity and hence no market discrimination program is needed at present.

For potatoes Venezuela has at the present only one market--direct consumption. But it is clear that secondary markets may be developed for potato chips and French fries on the one hand and the starch industry on the other. It was also pointed out that Venezuela seems to be competitive in the world market, so expansion should not be difficult. Because cooperatives that produce this root carry out supply control programs and because seeds are

13/ Besides wheat importation for human consumption some wheat is also imported for the mixed feed industry.
imported through the Agriculture Ministry and the B.A.P., it is not probable that Venezuela will have large surpluses of this commodity and, hence, a market discrimination program is not justifiable.

Sisal has two markets which are actually used—the domestic and the international—both in final goods form. For this reason a market discrimination program is not justified at the present time; nor is it necessary for black beans because consumption is largely supplied by importations.
CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The emphasis of this study has centered on the analysis of six price-supported agricultural commodities in Venezuela--rice, corn, black beans, potatoes, cotton, and sisal. The central objective was to test the hypothesis that the support price program in Venezuela has been the primary instrument in achieving self-sufficiency in the production of the most important supported commodities.

To test the general hypothesis, production, area harvested and yield of each supported commodity were analyzed by developing historical series and by the use of index numbers. It was found that the production and area harvested of these supported commodities as a group increased more rapidly than nonsupported commodities since the start of the price support program.

The average gross revenue as compared with the estimated direct costs of production for each commodity was also studied to indicate which commodity farmers were producing at a loss and which were produced with direct costs being covered. Producers of rice, corn, and sisal were found to be operating on the average at higher costs than the gross revenue received,
consequently on the average they have been losing money. Producers of black beans; potatoes and cotton seem to covering such direct costs and getting some return for management and other fixed costs.

It was found that the growers of the supported commodities—corn, cotton and black beans—were not making noticeable use of technological advances. This fact was reflected in their astonishingly constant low yields. The growers of rice have been making good use of technology during the dry season. During the rainy season both the rice and sisal growers have made, on the average, poor use of technology. Potato growers were the most advanced in the use of technology of the six crops analyzed.

Increasing production has been almost entirely explained by the large increase in the area harvested. From 1955 to 1967 the vegetable sub-sector increased its land use by 653,038 hectares, which corresponds to a 63.6% increase over the area harvested in 1955. The largest increase of new hectares brought into this sub-sector took place in 1960 and 1962, which matches with the starting period of the support price program (1959-1961). The supported commodities as a group changed their participation in the total cropland used from 38.19% in 1955 to 43.34% in 1967, which means that the area sown to these crops as a group increased more rapidly than the area sown to other commodities.
To analyze the response in production and area sown to the supported commodities, it was decided to use multiple regression analysis. This was estimated to be the best procedure to test the general hypothesis. According to this idea, production was made a function of public agricultural loans, area harvested, support prices and technological changes. The latter was measured by yields because of a lack of more accurate data and because any improvement made in technology is reflected in higher yields.

Four models of multiple regression analysis were developed. These showed the following:

Model "One" showed that area harvested has been the best predictor of production of the supported commodities except for black beans and potatoes. Support price (the $X_4$ variable) was found significant only in cotton production.

Model "Two" showed that prior to the support price program, area harvested was also the best predictor of production for all supported commodities except black beans and potatoes.

Model "Three" showed area as the best predictor for all but cotton and sisal. When the $b$ values of this model were compared with the $b$ values of Model "One", it was observed that support prices were not significant in this model either.

Model "Four" showed area as the best predictor of production for the supported commodities except for cotton and sisal. The
$X_4$ variable was significant only for potatoes.

It was concluded after the analysis of the residuals of each one of these models, that the most accurate predictor for the production of the agricultural commodities was Model "Four".

Because it was difficult to accept that the support price program was not significant in the production of the analyzed commodities, especially when the historical series have shown that production of almost all of the commodities started to increase rapidly when the program started, it was necessary to continue the analysis.

Support prices were assumed to have a value of "zero"; i.e., that they were not significant in determining $Y$ and an $F$ test was made for each commodity. The conclusion was that support price was only significant in determining potatoes and cotton production.

From the foregoing results, it was concluded that area harvested was the best predictor of total production so it was necessary to know what factors had affected area harvested. To determine this, two models (Models "Five" and "Six") were developed. Area harvested was made a function of agricultural public credit, support price and technology. The latter was measured as the average yield of the former year.
Model "Five" showed that support price and public credit have been the best predictors for area harvested. This may be interpreted that the Venezuelan farmers cultivate these supported commodities more because of a guaranteed price and the availability of credit than because of the yield such commodities may produce. This might be taken as an index of lack of farm management understanding in the sector.

Model "Six" showed public agricultural credit as the best predictor of area harvested. The available data about loans made for sisal production is too incomplete, so the equation for this commodity could not be determined. Consequently, this model contains five rather than six equations.

The former reason and the analysis of the residuals indicated Model "Five" as the most accurate model to determine area harvested. But it does tend to underestimate the area harvested for corn and cotton.

Based on the multiple regression models analyzed, it may be concluded that the production of the supported commodities in Venezuela is a function of area harvested, and at the same time, area harvested is a function of support price, and public credit. This also means that production of the six supported commodities analyzed depends basically on public policy and not on market conditions--the government aside as a buyer. This large
dependency on government also may be an index of poor farm management because decisions on what to produce appears to be more of a public decision than a farm management one based on relative profitableness.

The increase in agricultural production as a whole also was found to conform to public investment in the agricultural sector and with this protection agriculture has kept a moderate rate of participation in the gross national product. The special attention of the government to the sector seems to be explained as a desire to increase the welfare of a large segment of the population who represents the lowest per-capita income in the country. However, agricultural policy in Venezuela has not been clearly defined; no clear-cut goals have been enunciated and clear objectives have not been specified. The productivity of the agricultural sector was estimated to be only .23 which is the lowest sector among all the segments of the economy.

In the analysis of the market, surplus was found in only one supported commodity--rice, but possibilities for surpluses in corn and potatoes exist in the intermediate run, if the same production trend continues.

It may be concluded from the analysis of the market, that the surplus disposition for rice, and the prospective surplus of corn, faces two significant problems. One is the low price
elasticity of demand in the domestic market which reduces possibilities to expand human consumption through price reductions. The other is the low price in the international market coupled with high costs of production and high support prices domestically. Because of the last situation and because of the lack of a clear definition of the purpose of the support price program, the government has made exportations of rice at a large loss estimated between 40% and 60% of the real cost of the commodity to the government.

The most relevant problems of the price support program were analyzed in Chapter V and it was shown that it is necessary to clarify the support price program through a realistic economic and/or social definition. It is hoped that this would allow the government to make adjustments in the program in an attempt to correct the disequilibrium created in agriculture, or at least reduce the loss, because these problems may constitute a bottleneck to the subsequent development of the sector. The actual program is misallocating credit resources to one commodity (rice) that does not have current remunerative markets and for the future faces an export market that is tending to decline (18). This misallocation of public funds is at the same time creating misallocation of resources at the farm level because farmers
use support price and public credit to guide their decision-making process and because rice culture requires special machinery that once purchased must remain trapped in producing this commodity. Because producers of supported commodities respond to public policy this misallocation can be corrected with a minimum harm to farmers.

Indications of very poor farm management was found among producers of these supported commodities. This principal factor, together with lack of public and private research and high input costs, partially explain the low yield found among all the supported commodities.

To clarify the scope of the support price program and to solve many of the problems associated with it, the following measures are recommended for thorough consideration:

1. The government should analyze the domestic demand of each commodity to be supported and establish the national consumption needs. This would permit the government to establish realistic production goals.

2. It should establish movable reserves of these agricultural commodities to cover any irregular variation, which would permit

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14/ Part of this work was made during 1962, but it needs to be actualized.
easy determination of surpluses.

3. The price elasticity of supply for each commodity produced in Venezuela has to be determined. It would allow the government to know what would be the response of producers at a given scale of prices.

4. Policymakers have to decide how much they want to be produced for consumption in the domestic market, and based on the price elasticity of supply, to establish a support price that is high enough to get producers to respond for that required amount. The support price has to be flexible enough to change according to the actual need of each crop for a given year and must be announced in advance of seeding time.

5. If the government or producers find that a commodity has remunerative international market (as the case of tropical fruits) or research has shown that there will be such markets in the near future, it should be government policy to encourage the production of such commodity. This calls for a re-appraisal of the actual system that has encouraged excess rice production which has to be exported later with a high subsidy, instead of taking advantage of a large market for commodities with comparative advantage.

6. If there is a secondary market for the produced commodity as in the case of rice and corn, a market discrimination
program should be established. The government would cover with price support the amount of production required by the first market plus the reserve at the level determined by the price elasticity of supply, and at a lower price the amount produced for the secondary market.

7. Because the support price program alone does not increase the aggregate of agricultural production, it is also necessary to increase the level of technology (13) and good farm management. Now, because the farm manager requires some public information to make his decisions, it is also recommended that basic research be conducted in soil classification and possible yields in such soils with different amounts and combinations of fertilizers and other cultural practices.

The market discrimination program is recommended because it may correct the disequilibrium in agricultural production if applied early before surpluses have become too large. It could help to correct misallocation of resources at the farm level and at the same time it could contribute to the development of industries that use agricultural products as raw materials.
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