ERS-Foreign 51

THE DOMINICAN REPUBLIC

• Agriculture and Trade

UNITED STATES DEPARTMENT OF AGRICULTURE
Economic Research Service
Regional Analysis Division

PREFACE

Since the fall of the Trujillo Government in 1961, the U. S. Department of Agriculture has had a growing volume of requests for information relating to the agriculture and trade of the Dominican Republic. To offset the general lack of published data, the author traveled throughout this Caribbean Republic in June 1962 gathering as much information as possible. This report is a brief description and analysis of the country's agricultural economy with particular emphasis being given to recent developments.

ACKNOWLEDGMENTS

Numerous officials of the Dominican Republic gave generously of their time and knowledge to give me a picture of the agricultural economy of their country. Representatives of our own Government in this country were of invaluable assistance to me, and I have drawn heavily on their experience as well as their reports and appraisals of the current situation and the prospects for the future.

Washington, D. C. August 1963

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EXPLANATION OF TERMS

Weights and Measures

Unit	U. S. equivalent
Area:	
1 tarea	0.1554 acre
1 hectare	2.471 acres
Capacity, liquid:	
1 botella	.7608 quart
1 liter	1.0567 quarts
1 galon	.8560 gallon
Weight:	
1 libra	1.0 pound
1 arroba	25.0 pounds
1 quintal	100.0 pounds
1 paca	110.23 pounds
1 metric ton	2,204.6 pounds

Currency

Currency unit	Dominican Peso
Units per U. S. dollar	1.00
Equivalent sub-unit	100 centavos

Year Notations

A crop or fiscal year is denoted by a slash, for example, 1960/61. An average is written with a dash: 1959-61 or 1959/60-1961/62.

SUMMARY

The Dominican Republic's foreign trade is growing rapidly, and the United States is sharing in the increase. The United States is the country's principal market for agricultural exports as well as the major source for its farm and nonfarm imports alike. With recent wage increases and the decline in unemployment, the purchasing power of the people has increased and new demands for imported products have resulted. Purchases of agricultural products from abroad, after declining for several years, rebounded sharply in the first months of 1962, and reached record levels by mid-year.

The Dominican Republic is basically an agricultural country. Although other sectors of the economy have become increasingly important in the last decade, agriculture still dominates the country's economy. It contributes two-fifths of the national income, employs about 55 percent of the labor force, and furnishes nine-tenths of the value of all merchandise exports.

The expansion of the sugar industry and general economic policies of the Trujillo Government during the 1950's, though leading to increased exports, had an adverse effect on the economy as a whole. The effect would not have been so great if the returns from exports had been retained and invested within the country, but heavy expatriation of capital in these years contributed to the critical economic and social problems which were prevalent when that government fell in 1961.

Despite the overall increase in agricultural output, neither the production of food crops for domestic consumption nor food imports kept pace with the rapid population growth during the decade 1950-60. Heavy government interest in the major export crops led to mobilization of agricultural resources largely for the production of these commodities. While agricultural exports averaged about $140 million annually in the late 1950's, food imports lagged. The average diet of the Dominican people has been cited as being among the poorest in Latin America.

After the fall of the Trujillo Government in mid-1961, the Dominican Republic began the task of developing and diversifying its agriculturally based economy. In January 1962, the economic sanctions that the Organization of American States had placed on the country during the last year of the Trujillo Government were lifted, and this important Caribbean Republic joined the active ranks of the Alliance for Progress.

A month later, the Dominican Government received a credit of $25 million provided by the United States through the Agency for International Development (AID) under the Alliance for Progress. Signing of this credit agreement coincided with the re-establishment of an AID Mission in the country. This mission, functioning as part of the U. S. Embassy, is coordinating U. S. economic and technical assistance.

Additional credit was received later in 1962 including loans totaling $6.5 million from the Inter-American Development Bank and a $10 million line of credit from the Export-Import Bank. In March 1963, AID granted $22.75 million to the Dominican Government for economic and social development projects which will contribute to the economic rehabilitation of the country. About $12 million of this grant is to be used for agricultural credit, $5 million for livestock development, and $3 million for farm-to-market roads.

Early in 1962 a National Board of Planning and Coordination was created to draw up plans for the country's economic and social development. In view of the limited number of

competent adminsitrative and technically trained personnel presently in the country, special attention is being given to programs of highest priorty, such as land reform and farm credit.

Since March 1962, a variety of agricultural development programs, including land reform, agricultural education, research and extension, farm credit, improved livestock and poultry, farm-to-market roads, soil conservation, and reforestation, have been started.

While substantial progress has been made during the past year it is too early to assess either the potential or the overall results of these programs for several are just now getting underway. Given a reasonable degree of political and economic stability the agricultural sector is expected to contribute greatly to the country's economic development in the immediate years ahead. A primary task is to meet the sharply expanding local demand for food.

Until recently the Dominican Republic had been practically self-sufficient in the production of most food items. This was possible not because of high production of food products but because of inadequate levels of consumption, the result of the low purchasing power of most of the Dominicans. Demand for food has risen sharply, however, during the past 2 years in response to the substantial increase in wages and the decline in unemployment, and shortages have appeared. Furthermore, at current levels of consumption any future increase in purchasing power will be reflected largely in a corresponding increase in food purchases.

The Dominican Republic is a valuable and growing U. S. trading partner. With the exception of relatively small quantities of corn, rice, cotton, and beef, exports from the Dominican Republic are complementary to those of the United States. Because of greatly increased local demand, Dominican exports of corn, rice, and beef have fallen sharply, and are expected to be of lesser importance for the next few years.

U. S. exports to the Dominican Republic, both total and agricultural, dropped sharply in the period 1959-61. Chiefly responsible for the decline were the economic depression, the restrictions on imports, and the economic sanctions placed on the Trujillo Government by the Organization of American States. Since these sanctions were lifted, U. S. farm exports have been increasing rapidly totaling $9.9 million for 1962, four times the 1961 level.

The Dominican Republic is an important source of U. S. agricultural imports. Sugar is the principal import followed by coffee, cocoa, bananas, and cigar-type tobacco. U. S. imports of farm products from this country totaled $140 million in 1962.

The small proportion of the Dominican population now consuming the food products the country imports highlights the large potential market in the country that could develop with any overall improvement in the economy. This is particularly true for wheat and certain fruits and vegetables not produced in the country. Therefore, there should be a continued need for both larger domestic output and increased imports of foodstuffs. Large imports of breeding cattle, baby chicks, feed grains, seeds, and similar items will also be needed to implement the agricultural development programs.

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THE DOMINICAN REPUBLIC--AGRICULTURE AND TRADE

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INTRODUCTION

The Dominican Republic, situated in the heart of the Caribbean, is often termed the "Cradle of the Americas." Santo Domingo, the capital, is the oldest permanent settlement of European origin in the Americas. While the Spaniards were pushing out toward continental America, this settlement became the hub of Spanish influence in the New World.

The original Indian strain found in the country has long since lost its identity in the population. Today the principal racial strains are comprised of the descendants of the early Spanish colonists and of Negro slaves imported from Africa. About 15 percent of the population is white, 15-percent Negro, and 70 percent of mixed blood.

Like most of the Latin American countries, the Dominican Republic depends on a small number of agricultural products for its income. Agricultural activities have long been directed largely to the production of the major export crops, particularly sugar. Not only does the country lean heavily on sugar exports to provide foreign exchange, but internal trade and employment are widely influenced by the foreign market which determines how much, and at what price, sugar can be sold abroad.

The industrial sector is small but growing. Processing sugarcane is the principal industry, but other established plants are turning out cement; glass; textiles; bags, rope, and binder twine of sisal; such products as soaps, detergents, and toothpaste; cement and asbestos water pipe; furfural; flour; and meat and dairy products. In addition, there are several shoe and leather goods factories, garment factories, and many other smaller industries in the country. The Government is encouraging foreign investment, and in October 1962 passed a law which provided greater protection to agents of foreign firms.

Principal products mined and exported are bauxite, salt, gypsum, and iron ore. The country contains fairly large deposits of nickel-bearing ore that are being developed. Although drilling for oil continues, so far it has not been discovered in commercial quantities. As there is no coal, gas, or oil produced in the country, fuels most commonly used are bagasse (used in some sugar mills) and locally produced charcoal.

Fishing is a relatively unimportant industry in the country though efforts are being made to expand activities in ocean fishing. The chief fishing ports, all on the southern coast, are Azua, San Pedro de Macoris, and La Romana.

The country's gross national product is distributed as follows: Agriculture, 41 percent; commerce, 17 percent; manufacturing, 15 percent; government, 7 percent; and other, 20 percent. Per capita gross national product was about $240 in 1962.

Overall agricultural development in the Dominican Republic has progressed relatively slowly during the past 3 decades. Notable increases in a few export crops have not resulted in any economic betterment of the rural people. Although some agricultural diversification took place between 1930 and 1950, it was more than offset by the rapid expansion of the sugar industry during the 1950's. Present agricultural policy points toward greater development and diversification with particular emphasis on livestock and poultry, tobacco, peanuts, rice, and other food crops.

PHYSICAL ENVIRONMENT

The Dominican Republic, occupying the eastern two-thirds of the island of Hispaniola which lies in the Caribbean Sea between Cuba and Puerto Rico, shares the island with the Republic of Haiti. The country extends about 240 miles from east to west with a maximum width of about 170 miles. It has a coast line of about 1,000 miles, and a border in common with Haiti of almost 200 miles. Its area, including small adjacent islands, is 19,332 square miles, a little larger than the States of New Hampshire and Vermont combined.

Topography

The terrain is rugged with four almost parallel mountain ranges traversing the country in essentially an east-west direction. The Cordillera Central, the largest mountain range, divides the country into almost equal parts. It extends into Haiti, acts as the country's chief watershed and determines the direction of the rivers. Pico Duarte, the tallest mountain in the West Indies (10,206 feet), is in this range. In the north, the Cordillera Septentrional runs from Monte Cristi in the northwest across the tip of the Samana Peninsula. Two small ranges, are in the south, the Sierra de Neiba following a northwesterly line from the Bay of Neiba and the Sierra de Bahoruco rising through the center of the southern peninsula.

The largest and most fertile valley in the country, the Cibao, is located in the upper central part of the country lying between the Cordillera Central and the Cordillera Septentrional. It is about 150 miles long and 10 to 30 miles wide. Almost one-half of the inhabitants of the Dominican Republic live in the valley, which is often called the "Food Basket" of the country. The bulk of the rice, corn, beans, and other crops grown for domestic consumption are produced here as is the bulk of the cocoa, tobacco, and coffee produced for export. A watershed near the city of Santiago divides the Cibao into two distinct geographical and climatic regions, the eastern and the western.

Between the Cordillera Central and the southern coast of the country is a large coastal plain. Most of the sugarcane is produced on the eastern sector of this plain which also supports many of the country's cattle. The San Juan Valley in the interior upland is important agriculturally. This valley forms the eastern extension of the Central Plain of Haiti and lies between the Sierra de Neiba and the Cordillera Central.

Rivers in the Dominican Republic are seldom navigable and then only for short distances. Their main utility is, therefore, as sources of water for irrigation and for potential power. All the principal rivers rise in the Cordillera Central. In the north the Yaque del Norte, longest river in the country, winds some 250 miles westward from a point in the Cibao Valley south of the city of Santiago, emptying into the ocean near Monte Cristi. The eastern slope of the watershed near Santiago is the source for the Yuna River which runs to the east through the same valley

and empties into Samana Bay. On the southern side of the Cordillera Central flows the Rio Yaque del Sur, which drains a large part of the southwest part of the Republic. This river, along with its branches, empties into the Bay of Neiba at the eastern end of the Enriquillo Valley. The Artibonite River rises in the Dominican Republic and flows westward across Haiti, draining a large area of the Cordillera Central in the two countries. Other rivers having their sources in the Cordillera Central flow south across the coastal plain.

Lake Enriquillo, a salt lake some 140 feet below sea level and said to be saltier than sea water, is the largest lake in the Republic. Located between the Sierra Neiba and the Sierra de Bahoruco, it is constantly receding because of evaporation.

Climate

Climate is as varied as the topography of the country. Temperatures generally decrease at higher altitudes but many of the numerous intermont areas are situated in such a manner that there is a wide range in temperatures at similar altitudes. Although the country lies wholly in the tropics, the temperature seldom exceeds 90° F. owing mainly to the constant trade winds. The annual average in the coastal cities is about 78° F. with little seasonal variation throughout the year.

The rainfall pattern also varies from region to region. Approximately two-thirds of the annual rainfall comes during the rainy season, between May and November. However, the rainy seasons differ in various parts of the country. On the north coast the season is exactly opposite to that in the south. Annual rainfall averages 57.15 inches. It is distributed as follows:

	Inches		Inches
January	3.42	July	4.58
February	1.95	August	5.27
March	2.11	September	5.91
April	3.42	October	5.49
May	7.93	November	7.99
June	5.16	December	3.92

On the north coast and in the Cibao Valley the rainy season starts in October. The region of heaviest rainfall is from Puerto Plata to the Peninsula of Samana; the greatest rainfall recorded for any part of this region is in the Province of Duarte, the point that is most exposed to the direct trade winds. Rainfall decreases as the wind progresses to the northwest coast line. The average in the eastern part of the Cibao is 64.24 inches against 30.50 inches on the northwest coast.

From La Romana to San Pedro de Macoris in the southeast there is a short narrow belt which records an annual rainfall of only 40 inches, but inland a few miles rainfall increases considerably. Excluding this narrow strip, the annual average rainfall for the southeast coastal plain is about 60 inches.

Rainfall progressively decreases west of Santo Domingo all the way to the Haitian border. While the eastern half of the country receives well over 60 inches of rainfall annually, the western

half receives only slightly over half this amount. The following tabulation indicates the average annual rainfall at selected stations in the Dominican Republic:

	Inches
Samana	108.34
Sanchez	75.00
Puerto Plata	67.57
La Vega	66.42
El Seibo	61.26
Boca Chica	58.70
Santo Domingo	57.47
Santiago	40.08
Monte Cristi	34.87
Barahona	32.29
Azua	30.35

Source: Robiou, S. A. Special Report on Climatic Conditions in the Dominican Republic. Meterological Service, Cuidad Trujillo, D. N. 1941.

As the Dominican Republic lies within the hurricane belt, hurricanes constitute a major weather hazard particularly from August through October. Santo Domingo, was virtually destroyed by the country's worst hurricane on September 3, 1930.

Soils

The Dominican Republic has a wide variety of soils. Since soils vary widely within a comparatively small area, programs for agricultural development should be considered only after carefully studying the soil types.

Soils in the Cibao Valley, are for the most part, very fertile. In the eastern part of the Valley extending from the swamplands at the head of Samana Bay nearly to Santiago, the soil is characteristically a black clay underlain by a yellowish-brown calcareous clay subsoil. Besides this extremely fertile district, however, there are other areas in the eastern Cibao where fingers or ridges of yellow or yellowish-grey soils, some of them several miles in width, extend into the Valley from both the north and the south. These ridges have little or no depth of topsoil, and are low in fertility.

Irrigation is frequently essential for economical agricultural production in the western section of the Cibao Valley. The broad delta and flood plain of the Rio Yaque de Norte occupies a large part of this sector of the Valley. Between the low country and the foothills of the mountains to the south lies a strip of higher land dotted with gravelly knolls. The soil in this area varies from grey to reddish-brown clay. In general, soils in the western end of the Cibao are fertile, but since rainfall is sparse, the natural vegetation consists of thornbushes and cactus.

The San Juan Valley, some 60 miles long and 10 to 12 miles wide, consists of low hills, rolling plains, and fairly level prairies. Soils are reddish-brown to light-gray sandy loams to

sandy clay loams, with the alluvial soils on valley floors being above average in fertility. Although rainfall in this area is insufficient and poorly distributed, irrigation makes production of rice, yuca, tobacco, and other crops possible.

The soils in the Enriquillo Basin range from greyish-brown alluvial fine sandy loams to clay loams. The topsoil frequently exceeds a foot in depth. Although soils in this area are relatively high in salt content, large areas are irrigated for sugarcane production, particularly in the vicinity of Barahona.

The Coastal Plain area in the southeast part of the country is characterized by the presence of limestone rocks and, in general, is above average in fertility. In some areas large bare limestone rocks protrude through the topsoil, while in others the rocks are broken up and together with reddish or brown loams form the topsoils. In places where channels have been cut by streams, flood plains of rich alluvial soils are found.

POPULATION

The latest official census (1960) gave the population of the Dominican Republic as 3,013,525. Population growth has accelerated during the last decade, and the present annual growth rate is about 3.5 percent, among the highest in Latin America. This rapid growth in population has greatly aggravated the problem of providing an adequate food supply as well as posing other social and economic problems.

Although there has been considerable migration of the rural population to the cities in recent decades, almost 70 percent of the population is still considered rural (table 1). While the average population density today (1963) is about 170 per square mile, most of the people are concentrated in the agriculturally rich Cibao Valley and along the southern coast. According to the population census of 1960, 7 cities had populations over 20,000. The capital city, Santo Domingo, was by far the largest city with a population of 367,053 followed by Santiago with 83,523.

Table 1.--Rural and urban population of the Dominican Republic, selected years 1920 to 1960

Year	Total population	Rural population		Urban population		Population density, persons per sq. mile
		Rural total	Rural percentage of total	Urban total	Urban percentage of total	
1920	894,665	745,771	83.4	148,894	16.6	46
1935	1,479,417	1,212,852	82.0	266,565	18.0	77
1950	2,135,872	1,627,464	76.2	508,408	23.8	110
1960	3,013,525	2,095,544	69.5	917,981	30.5	156

Source: IV Censo Nacional de Poblacion, 1960.

The labor force was estimated at 900,000 in 1961. It was distributed as follows: agriculture 57 percent, manufacturing 5 percent, commerce 5 percent, construction, transport, and communications 4 percent, services 8 percent, and all other 21 percent. Underemployment rather than unemployment characterizes the manpower situation. Although there is a large reservoir of unskilled and untrained labor in the country, there is at the same time a shortage of semi-skilled and skilled workers. The lack of agricultural technicians is perhaps the greatest obstacle to the future development of agriculture in the Dominican Republic.

LAND USE AND TENURE

According to the 1950 agricultural census, only 48 percent of the total land area of the Dominican Republic was in farms 1/. Of the 2.3 million hectares in farms, land in crops accounted for 26 percent, managed pasture lands also 26 percent, unmanaged permanent pasture lands 12 percent, fallowland 10 percent, forests 19 percent, and the remainder in brush or left idle.

While no complete data is yet available, preliminary information from the 1960 agricultural census indicates that the area in farms increased by about 15 percent in the decade 1950-60. Land in crops has expanded about one-third since 1950 reflecting not only the increased area in farms, but also greater utilization of land through irrigation and other improved practices.

The 1950 census showed a marked concentration of landholdings. Less than 1 percent of the farms accounted for over two-fifths of the land in farms (table 2). On the other hand, 75 percent of the farms accounted for only 14 percent of the total area in farms. Three-fifths of the farms covering 58 percent of the total farmland were owner-operated (table 3).

Most of the large landholdings are located in the eastern provinces, particularly in the heavy sugarcane producing areas and cattle-raising sections. Medium-sized, owner-operated farms in the Cibao Valley produce most of the food crops marketed locally and most of the coffee, cocoa, and tobacco grown for export. Smaller farms, predominantly subsistence-type operations, are typical of those found in the isolated areas throughout the country, particularly along the Haitian border.

Preliminary data from the 1960 agricultural census indicates no betterment in the uneven land tenure pattern since 1950. Although the 1960 census showed about 175,000 more farms in 1960 than 1950, this expansion was largely due to sharp increases in the number of very small subsistence-type operations. For example, there were 131,795 more farms of less than 1 hectare in size listed in 1960 than in 1950. The number of small farms between 7 and 20 hectares in area actually decreased by about 10 percent and medium-sized farms between 20 and 100 hectares declined almost one-fifth during this decade (appendix table 14).

After the fall of the Trujillo Government the extensive landholdings belonging to the Trujillo family and others involved in the dictatorship came under state ownership. This land is now being distributed to landless farmers under the land reform program.

MARKETING AND TRANSPORTATION

Marketing, storage, and transportation facilities in the Dominican Republic for agricultural products other than sugar are inadequate. Major deficiencies include lack of grain warehouses, refrigerated wholesale and retail handling facilities, on-the-farm storage, and local or farm-to-market roads.

1/ An agricultural census was conducted in 1960. Selected preliminary data from that census are shown in the appendix.

Table 2.--Distribution of farmland by size of farm, Dominican Republic, 1950 1/

Size of farm	Number of farms	Percentage of total	Total area included in this size farm	Percentage of total farm area
	Thousands	Percent	1,000 hectares	Percent
Less than 1 hectare	92.9	33.5	47.9	2.0
1 to 5 hectares	116.6	42.1	270.4	11.7
5 to 10 hectares	32.9	11.9	224.7	9.6
10 to 20 hectares	17.2	6.2	245.9	10.6
20 to 25 hectares	9.8	3.6	297.7	12.8
50 to 100 hectares	3.2	1.2	223.5	9.6
100 to 500 hectares	1.8	.6	344.4	14.8
500 hectares and over	.3	.1	673.7	28.9
Total	274.7	100.0	2,328.2	100.0

1/ Excludes "farms" of less than 1 tarea (1 hectare = 15.9 tareas) of which the 1950 census reported 2,100 with a total area of less than 100 hectares.

Source: National Agricultural Census of 1950.

Table 3.--Number and area of holdings, by tenure, Dominican Republic, 1950

Tenure of class	Farm units		Farmland	
	Number	Percent	Area	Percent
			1,000 hectares	
Owner-operators	164,552	60	1,348.1	57.9
Managers	4,798	1.7	232.5	10
Rented on fixed cash basis	4,594	1.7	22.2	.9
Rented for a share of the product	12,460	4.5	34	1.5
Operated by colonato (colonist)	4,390	1.6	13.8	.6
Operated gratuitously 1/	36,122	13.1	97.8	4.2
Operated in concession	17,507	6.4	79.5	3.4
Operated under mixed forms of tenure	21,745	7.9	248.2	10.7
Operated under all other forms of tenure	8,580	3.1	252.1	10.8
Total	274,748	100.0	2,328.2	100.0

1/ State lands used for agricultural purposes on a no-rent basis.
Source: National Agricultural Census of 1950.

Lack of farm-to-market roads is a major obstacle to increasing agricultural production. Agricultural products are usually brought from isolated farming areas by human or animal power to central points and later transported to more populous centers by truck. This slow process results in substantial loss through spoilage, particularly for such highly perishable farm products as fruits, vegetables, milk, and eggs. Large towns and cities have daily markets, but villages usually have only one market day a week (fig. 1).

Figure 1.--Typical roadside stand near La Vega.

The Government has announced a program for the construction of access roads during 1963 and 1964. A Division of Access Roads has been created within the Ministry of Agriculture to undertake the study, construction, and maintenance of these roads. Plans call for the construction of 250 miles of access roads in 1963 and over 300 miles in 1964. This program is expected to alleviate partially the critical problem of transporting farm produce to market before spoilage takes place.

Railroads and highways do provide a relatively good nationwide transportation network between most of the principal towns and cities. There are 772 miles of railways of which 152 miles are 42-inch gage government-owned public lines, and 620 miles are 42-inch and 30-inch gage private railroads, mostly on sugar plantations. In 1961, there were 3,735 miles of improved roads, with over two-thirds of the total mileage paved. However, many of the roads are badly in need of repair.

The Dominican Republic has a small but growing merchant fleet with plans for its continued increase in size. Estimated gross registered tonnage is 27,013 (1958). Santo Domingo is the country's leading port with Puerto Plata, La Romana, and San Pedro de Macoris next in importance. Port improvements are being carried on continuously with modern dock equipment available to the larger ports. There is no significant inland water transport system in the country.

Marketing and storage cooperatives are being stimulated, particularly for rice, corn, and beans. Wide annual fluctuations in prices and frequent shortages of these products are due largely to inadequate storage. Small local food-processing industries are critically needed to provide incentive to increase local production and avoid large scale losses at peak harvest periods.

AGRICULTURAL POLICIES AND PROGRAMS

The present agricultural policy of the Dominican Republic is to maximize agriculture's contribution to the future economic development of the country. Along this line programs are being implemented to achieve sizable increases in farm output by enhancing the efficiency of agriculture through the introduction of advanced technology on a broad front. Particular emphasis is being given to establishing a more widely based agricultural economy which will be less subject to the world market fluctuations of its major export commodities.

Land Reform

Prior to the passing of the Agrarian Reform Law in April 1962, no substantial progress had been made to provide for a change in the uneven land distribution pattern and to increase the number of individual farm owners in the Dominican Republic.

A law passed in 1905 provided for the grant of state lands for agricultural use. Under this law the right to utilize land, gratuitously, for a period of 10 years was granted to any individual or agricultural corporation. At the end of the 10-year period the possessors of state lands were required to pay rent.

An Agricultural Colonization Law, passed in 1927, facilitated the establishment of colonies upon public lands or property purchased for this purpose by the Government. During the first 5 years the state could deprive the colonist of his land if he failed to comply with the conditions and requirements of the law. At the end of the 5-year period the grantee was to acquire title to the land.

In essence the colonization program provided for the settlement of landless campesinos in sparsely populated areas, particularly along the Haitian frontier. This land colonization policy also included settling foreign agricultural immigrants, mainly Japanese, Spaniards, and Hungarians. Although some 37 agricultural colonies consisting of 11,600 families were established over the years, generally, they were not successful because of lack of planning, credit, and technical assistance.

After the fall of the Trujillo Government in 1961 much of the extensive agricultural property of the Trujillo family and certain other persons associated with that government came under state control. Plans were made to distribute a large portion of this land to landless farmers in order to create a large number of owner-operated farm units of such size as to provide an adequate livelihood for the farmer and his family and also to have such productive capacity as to permit a continuous progressive improvement of the family.

The Agrarian Institute (see below) has undertaken the task of preparing an inventory and classification of all lands now owned by the state, and which can be considered as being available for the land reform program. Such a compilation is considered basic to the development of a sound long range agricultural program. By the end of 1962 the inventory and classification had been completed in 12 of the 26 provinces.

In April 1962, the Dominican Government passed a comprehensive Agrarian Reform Law. This law created an Agrarian Institute as an autonomous organization to administer the agrarian reform (fig. 2). The Institute is to have an agrarian reform fund for use in implementing the program. Income for this fund is being provided by the sale or rent of property assigned to the Institute, sale of products from property under the Institute's control, bank loans, donations, allotments from the national budget, and the sale of bonds issued by the Institute. The Institute has contracted the services of International Development Services Inc., a U. S. firm, as advisors on agrarian reform.

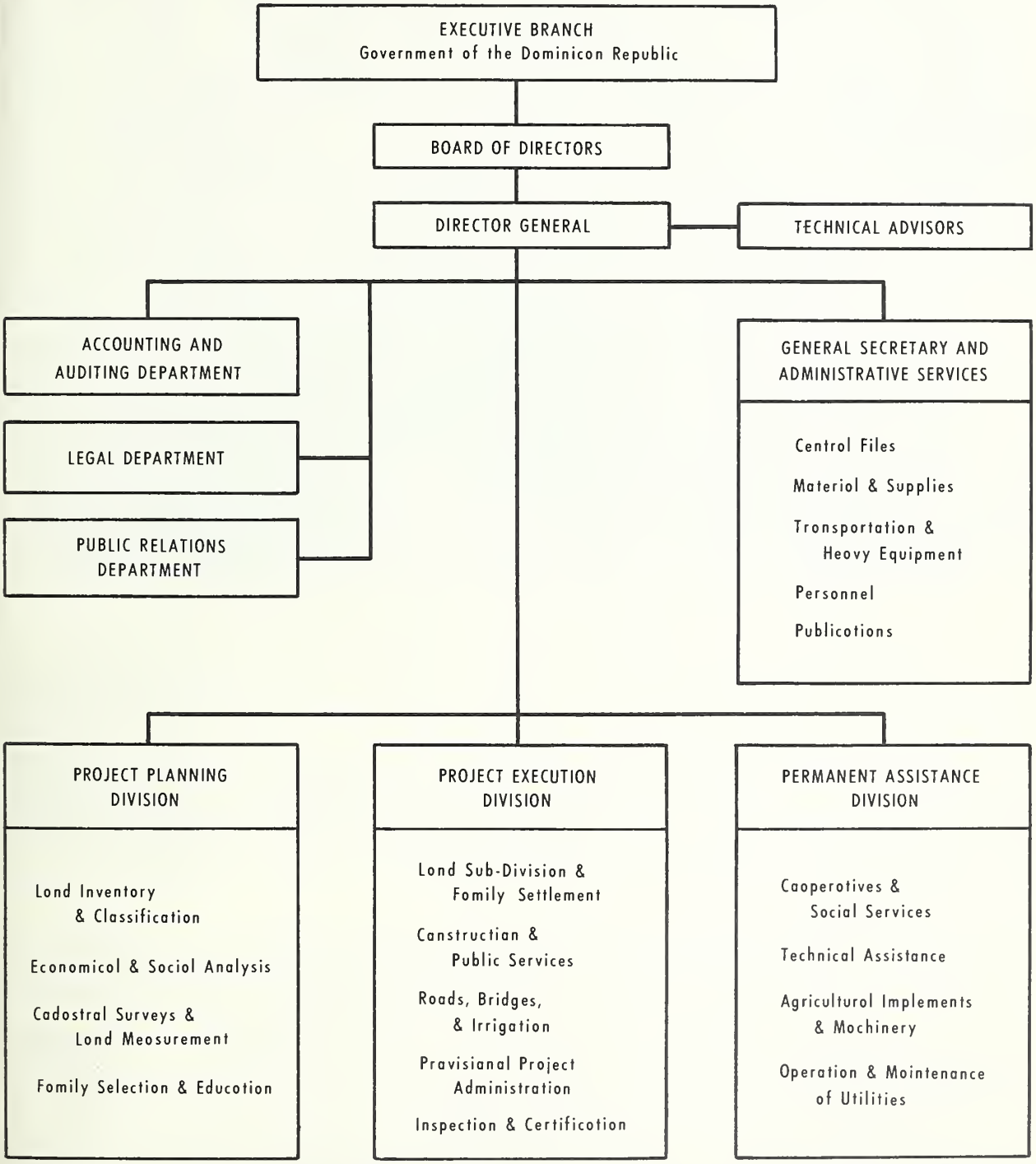
Provisions of the Agrarian Reform Law include among others: distributing land to landless farmers, developing and assisting in the operation of a supervised farm credit program, establishing programs for agricultural education, providing seeds and certain types of farm equipment, assisting in marketing agricultural products, stimulating farm and marketing cooperatives, and promoting agri-industries throughout the country.

Land parcels are to be distributed by "conditional sale" according to terms established by the Agrarian Reform Institute. In order to qualify for one of the lots an applicant must be over 18 years of age and less than 50, agree to work the property himself or with the aid of his immediate family, and not own sufficient property to support his family. Priority is to be given to those farmers who are already working the land to be distributed, persons displaced from their land by the land reform program, farmers experienced in the type of product to be grown, heads of families having dependents with productive potential, persons who can read and write or those willing to learn, and persons interested in participating in educational activities, in forming cooperatives, and in community development. Parcels are to be distributed by drawing lots (fig. 3). The conditional sales contract includes provisions restricting the beneficiary from selling, leasing, mortgaging, dividing, or in any other way altering or affecting the title to the parcel, without previous express written authorization from the Institute. According to the law, these restrictions shall cease as soon as the beneficiary obtains clear title to his parcel.

The land distribution program was initiated soon after the law was passed, and by mid-1963 about 2,100 farm families had already been settled. Supervised credit loans were made to the new landowners, and community development services were provided. The farmers were provided food from the United States under Title II, P. L. 480 until their first harvest (fig. 4). The long-term program is to include some 15 to 20 projects throughout the country. Plans are being implemented to settle 25,000 farm families between 1963 and 1967 and a total of 70,000 families by 1970.

The land is being granted in such parcel sizes as to satisfy the criterion of an economical or family-size unit. On irrigated land with a high production potential the parcel size is from 10 to 15 acres. On non-irrigated land with high potential the size varies from 15 to 20 acres. On other lands not suitable for intensive farming and having a lower potential, the parcel size is to be proportionately larger.

ORGANIZATIONAL CHART OF THE DOMINICAN AGRARIAN INSTITUTE, 1962



SOURCE: INTERNATIONAL DEVELOPMENT SERVICES, INC. SANTO DOMINGO, DOMINICAN REPUBLIC.

Figure 2

Figure 3.--Farmers receiving land titles by drawing lots.

Because it is possible to grow two or more crops a year on the irrigated land and since much of the cultivation is now done either by hand or with the aid of oxen, the size of the distributed parcels appears adequate for present levels of technology.

The goal of the Agrarian Institute is to settle the farm families and provide technical assistance and credit at an average cost of about $1,200 per family. The Bosch Government has stated that land reform is the core of its economic development program and plans to give it top priority in the immediate years ahead.

Agricultural Credit

In the past agricultural credit has not been available to the small farmer except at very high rates and on a short-term basis. This has limited the capacity of the small farmer to use his land and labor effectively to contribute to an increase in the national production of agricultural products for domestic consumption or export. An Agricultural and Industrial Credit Bank was created in the mid-1940's and began granting credit to agricultural enterprises. However, these loans were generally restricted to large commercial farms.

In view of the urgent need for agricultural credit to the small farmer, a national supervised agricultural credit program was initiated in March 1962. The prime objective of this program is to provide both short- and intermediate-term credit for the small farmer in amounts up to $3,000. Under this program total charges--interest rate, surcharge, or fees--cannot exceed 8 percent per year. Small farmers are defined as those who own or rent property but who do not utilize more than 3 additional farm laborers.

Figure 4.--Farmers receiving PL 480, Title II food on land reform project in Juma-Caracol Region, 1963.

The recently reorganized Agricultural Bank is the responsible agency for providing loans and the necessary technical supervision to operate the supervised credit project. During 1962 the Inter-American Development Bank furnished several technicians to assist in developing the rural credit system. The program is to be carried out in cooperation with the new Extension Service, which will provide the additional technical support not available from the staff of the Bank. The Bank is striving to implement its loan programs in areas where the Ministry of Agriculture has initiated an Extension Service.

During 1962, 37,086 loans totaling $11.2 million were made to farmers. Most of the loans were for financing production of rice, tobacco, and peanuts. The Government plans to expand the farm credit program sharply during 1963.

Agricultural Extension and Education

Education in general and agricultural education in particular has long been neglected in the Dominican Republic. Although primary education is free and obligatory between 7 and 14 years of age, only about 45 percent of the population 10 years old and over are literate. Secondary, normal, vocational, and special schools are either wholly maintained by the state or state-aided.

Before the Faculty of Agronomy was expanded at the University of Santo Domingo in mid-1962, there was no adequate program available for agricultural education at the university level within the country. In November 1962, the first classes were held. Most of the 80 students

enrolled came from the rural regions of the interior of the country, some of them from wealthy land-owning families but most from families with smaller holdings. The first of 4 years of classwork will consist largely of preparatory instruction, but soil studies and other courses more directly related to agronomy are to be given in the second and later years of the course.

In August 1962, the Dominican Government began construction of a vocational agricultural school near Santiago to serve as a pilot project for similar schools in other parts of the country. The target date for opening this school and initiation of the first class of 75 students is September 1963. A 3-year curriculum, beginning at the ninth grade level will be offered. The school will have classrooms and dormitory facilities to accommodate a total of 200 students.

An agricultural extension program was started in the Dominican Republic in 1932, but it never contributed much to agricultural development because of lack of government support.

A new National Agricultural Extension Service was established within the Ministry of Agriculture in July 1962. Its basic objective is to educate the rural people through practical methods to increase the efficiency and quantity of production and to improve the home and community.

Initiation of the program in the field began shortly after July and received impetus with the establishment of two field agencies, one at Bani and the other at San Jose de las Matas, late in the year. These two offices are to be used as training centers for establishing additional field stations.

Since July 1962, some 130 agriculturally trained U. S. Peace Corpsmen have arrived in the country to assist in community development. Most of the corpsmen are concentrated in the Cibao Valley (fig. 5). Along with a number of Dominicans, who trained with them in Puerto Rico, the volunteers are undertaking such activities as: reforestation, formation of rural youth organizations, well digging, and elementary agricultural education.

The major obstacle facing the Extension Service is the critical lack of trained agricultural technicians. The Agrarian Reform Institute is currently conducting training programs for project managers, soil specialists, farm management technicians, and others for employment in the Extension Service. Puerto Rico's Extension Service is supplying instructors to teach rural development techniques.

Agricultural Cooperatives

The agricultural cooperative movement in the Dominican Republic until recently had not been significant. Cooperatives were developed in some of the colonies formed during the 1930's and 1940's, but their activities were limited.

A principal duty of the Agrarian Reform Institute is to stimulate agricultural marketing, storage, and processing cooperatives. The Agricultural Bank, the financing organization for the newly created cooperatives, has designated $500,000 to initiate the program.

In August 1962, the Cooperative Development Authority of Puerto Rico agreed to assist the Dominican Ministry of Agriculture and the Agricultural Bank in the development of farm cooperatives. Under the agreement Dominican participants will receive training in Puerto Rico, and advisors will be provided to implement the program within the country.

Figure 5.--U. S. Peace Corps volunteer demonstrating soil test.

U. S. Peace Corpsmen are also assisting in creating cooperatives. Some 30 volunteers are currently engaged full time in cooperative activities throughout the country.

AGRICULTURAL PRODUCTION PRACTICES

Agricultural practices in the Dominican Republic range from the outdated procedures used on the subsistence farms to modern cultural methods on many of the large commercial farms. During the last two decades some progress has been made in farm mechanization, fertilization, seed improvement, and disease control. Perhaps the most notable progress has been in expanding the area under irrigation. However, very little has been accomplished in soil conservation.

Soil Conservation

Although comprehensive soil conservation programs are planned. most farmers are not now acquainted with even the most rudimentary procedures for reducing soil erosion and maintaining soil fertility.

Forests are disappearing at an accelerated rate. Removal of large areas of forests has accentuated the soil erosion problem. Originally, the forest vegetation retained a large part of the rainfall, and water would seep down the slopes gradually. Now, however. large areas are denuded of trees largely because of uncontrolled burning and clearing by squatters. As a result,

water runs off at a greater velocity, carrying along with it large quantities of topsoil. Few measures have been taken to impede the swift runoffs; hillside fields of corn and other crops are often planted in rows running up and down the slopes. Only a small number of progressive farmers have introduced sound cultural practices, such as contour plowing, strip cropping, conversion of gullies to grassed waterways, crop rotation, and terracing.

In mid-1962, a National Forest Service was established. Fire control, policing, conservation, and better utilization of the forest reserves are targets of the new forest service. A comprehensive reforestation program is planned for areas best suited to forests.

Irrigation

Almost one-third of the country is too dry to produce crops without irrigation. However, a wide network of irrigation canals has been constructed throughout the country during the last 3 decades, and further works are planned.

An Irrigation Service (Servicio de Irrigacion) was established in 1932. At that time there were only a few irrigation canals watering less than 4,000 hectares. The area under irrigation expanded rapidly in the 1940's and 1950's. It totaled about 75,000 hectares in 1952 and rose sharply to some 160,000 hectares in 1961.

With a large part of the irrigated land planted to rice, the sharp rise in rice production during the past two decades has corresponded closely to the expansion of irrigation. Other crops irrigated include tobacco and sugarcane, particularly in the vicinity of Barahona.

Ditch irrigation is the system most commonly used. In 1961, there were some 80 canals with a total length of about 1,500 miles. However, some of the canals were unserviceble because of siltation and lack of machinery for maintenance. Lack of capital has been the primary obstacle to expansion of irrigation in the past. In March 1963, however, the Government announced an agreement with a European banking consortium for a line of credit of up to $150 million. Among the major projects to be financed by this loan are hydroelectric plants at Tavera and Valdesia and associated irrigation systems. It is expected that irrigation will be expanded sharply in these areas upon completion of the two large dams.

Crop Fertilization

Little use was made of chemical fertilizers in the Dominican Republic prior to World War II. This was due largely to high cost, abundant fertile land in relation to population, and relatively low prices on world markets for the country's principal agricultural exports. In the postwar period higher world prices for agricultural exports and increased use of available land have resulted in a gradual adoption of fertilization of crops, particularly on the large commercial farms.

On June 22, 1956, a law was passed (Law No. 4480) encouraging the use of fertilizer. Article 1 of that law stated: "The use of fertilizers for all crops that are basic to the national economy is declared to be in the national interest, as a means of increasing the yield and the quality of crops and reducing their costs of production." Although the law was never put into full operation, it did result, at least temporarily, in a sharp increase in fertilizer imports. Imports rose from 13,200 metric tons in 1955 to 44,400 tons in 1957 but dropped thereafter and totaled only 19,600 tons in 1960. About half of fertilizer imports are sulphate of ammonia and most of the rest superphosphate.

There is only one large chemical fertilizer company in the country, and it imports virtually all the raw material used to produce fertilizer. Production started in 1952 and expanded rapidly, reaching a peak of 48,561 metric tons in 1959. It then fell sharply to only 20,738 metric tons in 1960 principally because of slackened demand.

Most of the chemical fertilizers are applied to sugarcane, tobacco, and rice. Low income and general lack of technical knowledge regarding application of fertilizers under improved cultural practices have impeded their use for corn, beans, and other crops grown on most small farms. The new supervised farm credit program has been granting loans to small farmers for fertilizer purchases; its use in the future will depend largely on the availability of additional credit and technical aid in demonstrating its proper use.

Farm Mechanization

The small size of most farm units combined with the high initial cost and maintenance expenses restricts the use of farm machinery in the Dominican Republic. The usual implements found on the many subsistence farms are the machete and the hoe, while oxen provide the chief traction power (fig. 6). According to the 1950 agricultural census, there were only 1,227 tractors being used for agriculture in the whole country. Some 250 tractors were imported between 1950 and 1952 in response to a government mechanization drive but imports dropped in succeeding years. It is estimated that about 2,000 tractors are presently being used in agriculture.

Figure 6.--Oxen team at work in field near La Vega.

Most of the farm machinery is utilized in the production of sugar and rice. Servicing agricultural machinery is a major problem because many areas lack sufficient tractors and other equipment to justify the existence of specialized repair shops. Practically all the tractors and other farm equipment are imported from the United States.

AGRICULTURAL PRODUCTION

Agricultural development and diversification in the Dominican Republic suffered a setback during the decade 1950-60. The rapid expansion of the sugar industry during this period, though greatly increasing exports, disrupted the organization of agricultural resources. Production of certain food crops fell during this period, and food output for local consumption as a whole did not keep pace with the 42-percent population increase registered during this decade (table 4). Present agricultural production policy points toward greater development and diversification, with particular emphasis on livestock and poultry, tobacco, rice, peanuts, and other food crops.

Crop Production

Sugarcane is the Dominican Republic's principal crop; production of sugar its largest industry. For many years this country has been one of the world's leading exporters of sugar. Exports, principally in the form of unrefined sugar, averaged about 500,000 metric tons annually in the period 1950-54 but rose sharply thereafter, reaching a peak of over a million tons in 1960. Since that record year, exports have been averaging about 800,000 tons annually. Sugar and derivatives now make up about 60 percent of total exports (fig. 7). Because sugar plays such an important part in the entire Dominican economy, changes in either the volume or the price of sugar exports are reflected in all phases of the country's trade.

Table 4.--Principal crops: Estimated production of principal crops, Dominican Republic, average 1952/53-1954/55, annual 1957/58-1961/62 1/

Crop	Average 1952/53-1954/55	1957/58	1958/59	1959/60	1960/61	1961/62
	1,000 metric tons					
Sugar, centrifugal	618	787	902	859	873	872
Coffee	29	39	26	35	30	36
Cacao	36	35	31	39	35	35
Tobacco	18	21	18	18	23	26
Rice (rough)	93	111	125	116	136	144
Corn	90	94	89	84	86	83
Beans	21	18	21	27	24	17
Peanuts	27	61	65	62	45	55
Sweet potatoes	85	79	80	80	80	80
Yuca	130	138	154	159	168	188

1/ Production data for beans, sweetpotatoes, and yuca are for the calendar year ending December 31 of the first year shown; rice, cocoa, coffee, and tobacco are harvested mainly in the first year shown of the split-year combination; sugar, corn, and peanuts are harvested mainly in the second year of the split-year combination.

Source: Economic Research Service, Regional Analysis Division. Indicies of Agricultural Production for the 20 Latin American Countries. U. S. Dept. Agr., Econ. Res. Serv. ERS-Foreign 44. November 1962.

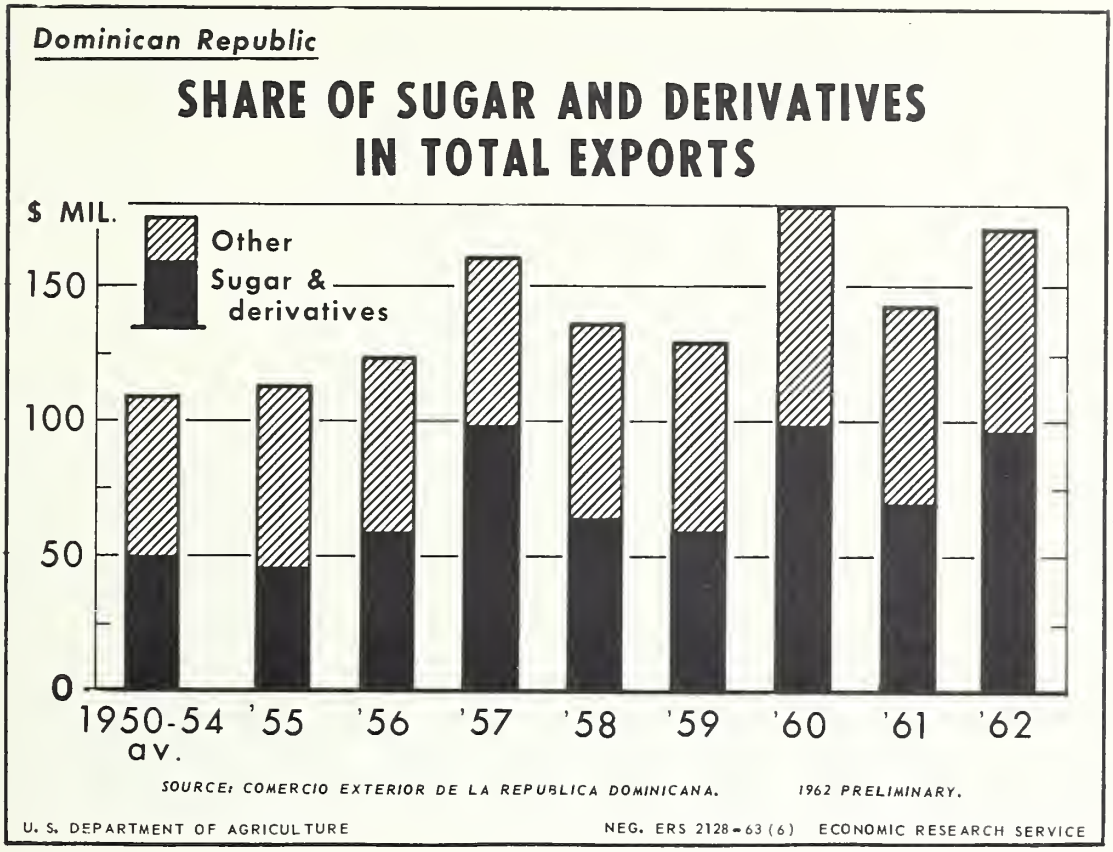


Figure 7

In the early 1950's, after 15 years of relatively stable production and despite growing world supplies of sugar, the Dominican Republic began to increase production of sugar and to expand total investment in the industry. Much of this increase was directly attributable to the Trujillo family's interest in sugar. By the late fifties, the Trujillos controlled two-thirds of the entire sugar industry.

Perhaps this sugar expansion policy would not have been an obstacle to overall development of the Dominican economy if the return from the exports had been retained and invested within the country. But heavy expatriation of capital in the period 1950-61 was largely responsible for the critical economic and social problems prevalent at the time of the fall of the Trujillo Government.

Despite the country's favorable climate and fertile soils, yields of sugarcane are low. In 1960, the average yield of sugarcane was only 55.7 metric tons per harvested hectare (table 5). If more intensive cultivation practices were used, such as more frequent replanting of cane fields and greater use of machinery, fertilizers, and irrigation, yields per hectare could be greatly increased.

Sugar processing, on the other hand, has been highly developed with several large modern mills built during the past decade. Of the 16 mills operating in 1960, the two largest and most modern of them accounted for about half the total cane cut and processed (table 5). Current milling capacity exceeds present sugar output by a substantial margin.

Table 5.--Area of sugarcane harvested and yields of cane and sugar, by specified sugar mill, 1960

Mill	Area harvested	Yield of cane per hectare	Yield of sugar per ton of cane
	Hectares	Metric tons	Kilograms
Amistad	1,427	51.74	86
Angelina	2,443	56.86	105
Barahona	16,567	55.15	109
Boca Chica	6,212	53.86	125
Caei	3,717	56.78	112
Catarey	6,372	55.00	118
Consuelo	11,417	56.14	107
Cristobal Colon	4,753	53.60	107
Esperanza	4,050	58.06	75
Monte Llano	5,301	57.75	103
Ozama	9,712	55.35	121
Porvenir	9,072	54.41	103
Quisqueya	5,551	56.15	112
Rio Haina	41,556	55.85	110
Romana	49,940	55.87	109
Santa Fe	5,123	55.10	104
Total or average	183,213	55.65	107

Source: Estadistica Industrial de la Republica Dominicana, 1960.

About 85 percent of the sugarcane is grown in the southeastern part of the country and the rest is grown mostly near Puerto Plata on the north coast and in the Barahona area in the southwest. Most of the cane grown in the southeast and near Puerto Plata is produced on non-irrigated land, whereas the major portion of the cane in the Barahona area is irrigated.

Planting is done by hand, an expensive and slow operation, but, only about 15 percent of the total cane area is replanted each year. Before planting, the land is prepared with large diesel tractors (fig. 8). Furrows are then opened and cuttings of cane stalks, each with several joints, are placed in the furrows by hand and covered. Seeds from the sugarcane plant cannot be used for planting, because they do not produce cane with the same characteristics as the parent plant.

Several varieties of cane are grown in the Dominican Republic, the principal variety being P. O. J. 2878. Since the mid-fifties, particularly in the southeast near La Romana, plantings have been largely Barbados varieties which are gradually replacing the P. O. J. hybrids.

The planted cane sprouts at the joints and, with sufficient moisture, appears above the ground in about 2 weeks. The cane is then cultivated to control the weeds, sometimes by tractors, but normally by ox-drawn light cultivators. In some areas the cultivation is done entirely by hand hoeing. After the cane is tall enough to shade the ground, cultivation is no longer required. Spraying to kill weeds is becoming a common practice.

The plant cane, or gran cultura as the first crop is called, is harvested about 14 to 18 months after planting. After that the cane grows perennially from the same root structure pro-

Figure 8.--Worker preparing land for planting sugarcane.

ducing a crop, called ratoons, every 12 months for a number of years. The first crop has the highest yield while yields of subsequent crops gradually decline to a point where it becomes more economical to replant.

Since harvesting is largely a manual operation, a great deal of manpower is required during the zafra (cane-harvest period) which normally begins in early December and ends in June. In the past some 12,000-15,000 laborers were brought in from Haiti each year to assist in the cutting, but the number of Haitians used in 1962 was reduced in order to provide greater local employment.

The dense, tall, and heavy growth of cane is cut off by hand at the base of the stalk with a machete. Leaves and tops are then stripped off, and the cane cut into lengths of about 4 feet. It is then loaded onto ox carts, or in some areas, onto tractor-drawn trailers or trucks and taken to loading stations where the cane is transferred by hand, or by cane derricks, onto railroad cars or trucks for transport to the mills (fig. 9). If the mill is nearby, the cane is taken directly there from the field.

Mechanical field loading of the cane onto trucks, trailers, and carts is expanding, and experiments on mechanical cutting have been conducted (fig. 10). However, to date cane-cutting machines have not performed satisfactorily and all the cane is still cut by hand.

Yields of cane vary widely between the first crop (plant cane) and the later crops (ratoons). Yields of 80-95 metric tons per hectare are frequently obtained from plant cane while average

Figure 9.--Sugarcane arriving at mill for processing.

yields of 40-45 metric tons per hectare on the ratoons are considered good. Such yields are low compared with those obtained in Hawaii, Peru, and Indonesia where cultivation is much more intensive.

Some nine-tenths of the 1959/60 sugarcane crop was grown on land owned by the sugar mills; the rest being produced by colonos (cane growers) on privately owned land. Several of the smaller mills grow their entire cane supply while the two largest mills, Romana and Rio Haina, purchased 18 percent and 13 percent, respectively, of their cane supply from nearby colonos in 1959/60.

Sugarcane diseases most prevalent in the Dominican Republic include mosaic, a virus disease, and ring spot, a fungus disease. The only insect that causes any significant damage is the sugarcane moth borer (Diatrea sacharalis). A program for the biological control of the moth by a fly parasite, the Cuban fly (Lixophaga diatrea), is underway. Special laboratories have been established for artifical breeding of the fly in the country.

All but about 10 percent of the sugar crop is exported. Until recently Great Britain was the principal market for Dominican sugar, but since the cessation of U. S. sugar purchases

Figure 10.--Sugarcane being loaded into wagons by machine.

from Cuba in mid-1960, sales to the United States have risen sharply. As a consequence of the reallocation of sugar shortfalls and increases in the estimates of U. S. consumption, the total exports of Dominican sugar to the United States for the year 1962 amounted to 781,574 metric tons, raw value.

Sugar production in 1962/63 is expected to decline to 790,000 metric tons, a reduction of about 80,000 tons from the 1961/62 crop. Labor problems are given as the principal factor in limiting production. The recent rise in the world price for sugar has led to labor demands for higher wages and disputes have resulted.

Cutting sugarcane by hand is arduous work and provides full time employment for the majority of the sugar workers only during the seven month period December-June. As development and diversification of the economy progresses and other employment opportunities become available, it will be increasingly difficult to find Dominican workers to meet the seasonal labor demands of the sugar industry.

The future of the country's sugar industry depends heavily upon resolving the labor problems. It is expected that greater emphasis will be given to mechanization, particularly to cane loading and handling, in the immediate years ahead.

Coffee

Coffee ranks second among export crops. Cultivation of coffee began in the Dominican Republic about the middle of the 18th century, and for many years coffee has been one of the

country's principal exports (fig. 11). Before World War II the bulk of Dominican coffee was marketed in Europe, but today about four-fifths of the coffee exports are sold to the United States.

Figure 11.--Workers spreading coffee beans on a drying platform.

Most of the coffee is grown in the mountains bordering the Cibao Valley with over half of total production coming from La Vega, Salcedo, Santiago, and Duarte provinces. Sizable quantities are also grown in the Barahona area. Production trended upward during the early 1950's but has leveled off since 1959.

A Coffee and Cocoa Administration was established in mid-1961. The Administration is responsible for all matters relating to the development and improvement of production of coffee and cocoa. About $400,000 has been budgeted for coffee rehabilitation and cultural programs, including extension work and establishment of several coffee experiment stations. Emphasis, however, will be on extending coffee cultivation into new areas, principally in the higher altitudes, not presently cultivated. In the past, poor transportation and marketing facilities were major obstacles to coffee expansion, but these obstacles are expected to be reduced by the program for construction of access roads.

The 1962/63 coffee crop totaled 550,000 bags compared with the previous year's crop of 600,000 bags (132.3 pounds each). Normally, the winter coffee crop is harvested from October

through December by migratory labor moving progressively from the lower to the higher altitudes as the beans ripen. Unusual weather in October 1962, however, caused virtually all the crop to ripen at once, and the demand for labor was greater than the supply available. Thus, the growers were faced with both a storage and a labor problem. As a result there was some loss in the quantity and quality of coffee harvested. The 1963/64 crop is forecast at 650,000 bags.

Cocoa

Normally, cocoa ranks third in export crops, but sometimes exceeds coffee in relative position (fig. 12). An average of four-fifths of the total production of cocoa beans is exported as raw beans or in the form of chocolate slab and byproducts.

Most of the cocoa is produced in the fertile Cibao Valley in the north-central sector of the country, with over one-third of total output coming from Duarte Province. The climate and soil in that area are excellent for cocoa culture. Production has held relatively stable in recent years, averaging 35,000 metric tons in the period 1957-62. Exports of cocoa beans, cocoa butter, and chocolate, practically all going to the United States, totaled 25,474 metric tons in 1961.

The Coffee and Cocoa Administration is stimulating cocoa cultivation. In September 1961, a special fund was established to expand the industry, and the outlook is for moderate annual increases in production.

Bananas

Commercial banana production for export is a relatively new industry in the Dominican Republic. Exports expanded sharply during the 1950's from an average of 1.8 million stems in the period 1951-55 to about 8 million stems in 1962, valued at over $11 million (fig. 13). Although bananas are grown for local consumption in many areas throughout the country, commercial production is primarily concentrated in the northwest near Monte Cristi. Almost 90 percent of the commercial production is exported to West Germany, the United States, and the Netherlands.

Tobacco

The Dominican Republic, potentially an important producer of high quality cigar tobacco, hopes to improve even more the quality of their tobacco to capture some of the U. S. market formerly supplied by Cuba. In the past there has been no effective grading system based on quality, nor was any premium paid for quality export leaf. Because of these factors, the farmer had little incentive to raise the standard of his product.

In June 1962, the Government created the Tobacco Institute of the Dominican Republic, principally to promote greater tobacco cultivation. The Institute offers technical assistance to growers and attempts to obtain credit and stabilize markets for tobacco growers. In February 1963, an experimental station and tobacco training school was inaugurated near La Vega.

Dominican tobacco is of the dark, air-cured types known as "criollo," most of which is exported, and "olor," which is consumed locally.

Production of tobacco has been trending upward since the late 1950's and totaled 26,000 metric tons in 1961. Normally, about 80 percent of the tobacco produced is exported. In the past,

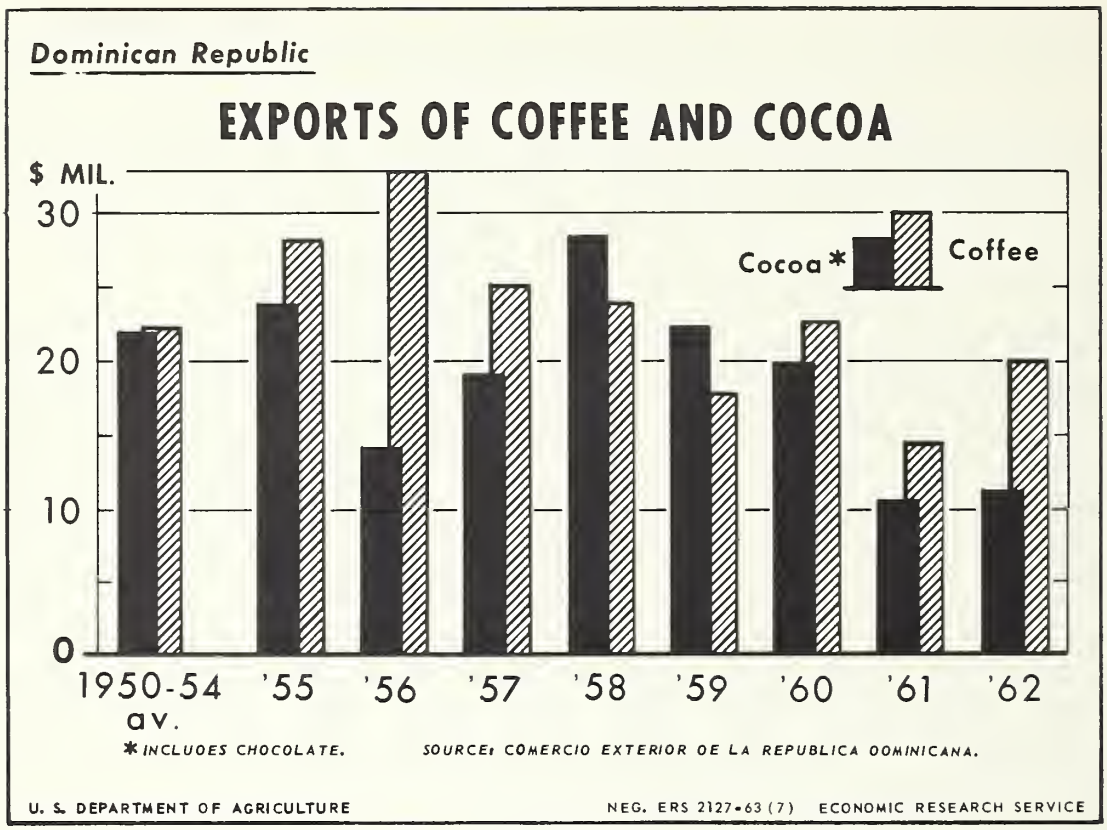


Figure 12

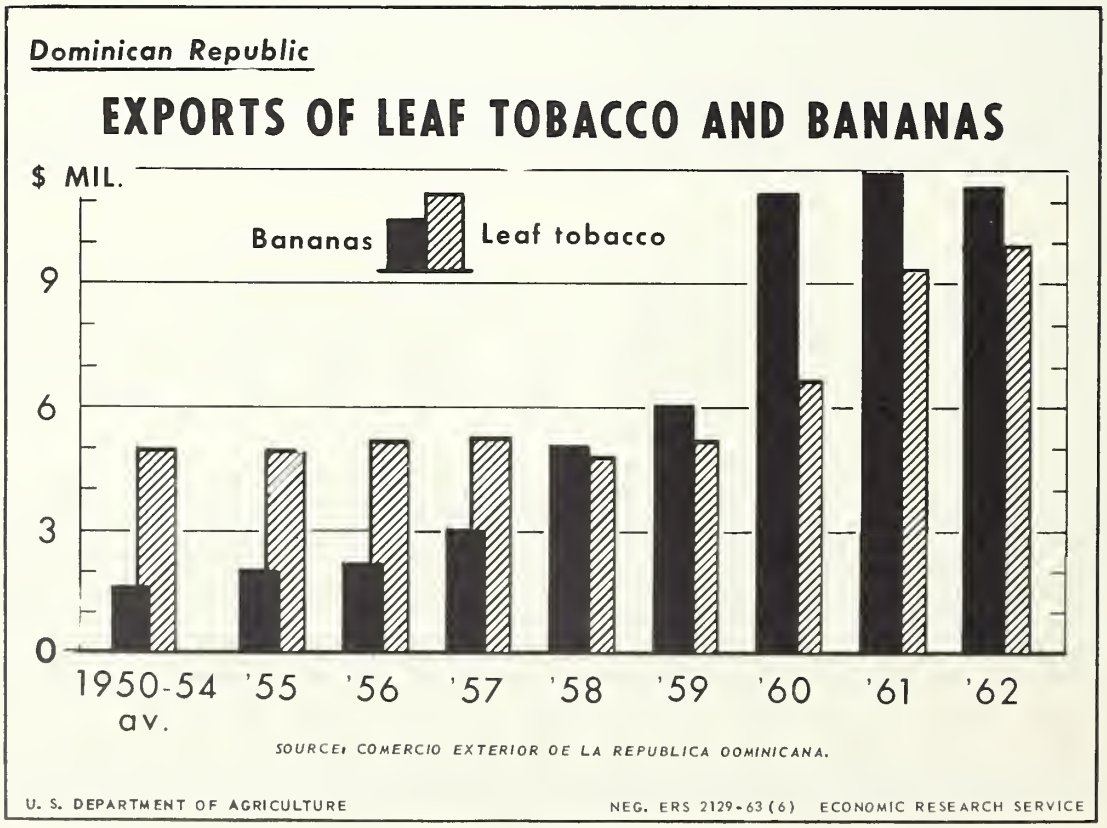


Figure 13

exports have gone principally to Spain, the Netherlands, West Germany, and Belgium, but since 1961 the share going to Puerto Rico and the United States has increased sharply.

In August 1962, the Tobacco Institute launched a broad program for expanding and developing the tobacco industry. Production in 1963 is expected to total about 32,000 metric tons, and the Government hopes to raise production to 45,000 metric tons in the near future. Most of the tobacco is produced in the Cibao Valley in the north-central part of the country with over half of total output grown in Santiago Province. Tobacco, normally planted between September and November, is harvested from January through April.

The Tobacco Institute reported in early 1963 that cigarette consumption in the Dominican Republic increased from approximately 800 million pieces in 1961 to over 1,280 million in 1962. A new cigarette factory is being built in Santiago to help meet the new demand.

Rice

Rice is the most important staple in the Dominican diet. Until World War II, rice was largely imported, but since then domestic production has steadily trended upward. Much of the effort on agricultural development, excluding the major export crops, has been directed toward increasing the rice output, with large areas of land being brought into cultivation through irrigation. A large part of the land distributed thus far under the land reform program has been planted to rice.

The Government has also initiated a rice production program to provide technical assistance, credit for small farmers, and machinery for larger plantations. With most of the country's rice grown in the Cibao Valley, particularly in the area between La Vega and Santiago, a central rice experiment station was established in La Vega Province to perform such activities as finding better adapted rice varieties and to test responses to fertilizers. Current plans call for establishing four branch stations in other areas of the country.

Although rice production increased 10 percent during 1962, domestic consumption expanded so sharply that no rice was exported as in previous years. Furthermore, rice was imported from the United States under a December 1962 Title IV, P. L. 480 agreement in order to avoid a severe shortage and rising prices. Some 30,000 metric tons will be imported by the Agricultural Bank and sold at regulated prices. The local currency received from such sales will be used by the Bank to build warehouses, and refrigeration facilities, to purchase cattle for breeding, to make loans to farmers, and for other agricultural purposes. The first shipment of rice under this agreement arrived late in December 1962.

Corn

Two out of three Dominican farms grow some corn, but production has been relatively stable for a decade. About two-thirds of the corn produced is consumed as food, mostly in rural areas and by low-income groups in urban areas.

Corn has been a relatively important export crop, going chiefly to Puerto Rico. Exports of corn during the 1950's fluctuated between 15,000 and 20,000 metric tons annually and totaled 17,144 tons in 1961. The Government is encouraging the expansion of feed-grain output to provide concentrates for the growing poultry industry. Yields are expected to increase sharply

with the use of additional fertilizers and better adapted varieties. Exports of corn are expected to decline to low levels in view of the expanding local demand. Imports may even be necessary until domestic production can catch up with the growing market.

Peanuts

Production of peanuts has tripled since 1950 and peanut oil has replaced lard as the traditional cooking fat. The principal factor leading to this expansion has been the Government's drive to become self-sufficient in the production of fats and oils. Practically all peanuts produced in the Dominican Republic are used for cooking and table oil. Only small amounts are consumed directly as peanuts.

There are two plantings of peanuts in the Dominican Republic. The "winter" crop is planted in November and harvested in April and May, and the main crop, which is about twice as large as the winter crop, is planted in April-May and harvested in late summer.

In 1962, 3,600 metric tons of crude peanut oil were imported to ease the shortage created by the sharp increase in domestic consumption.

The production of peanuts in 1962 was estimated at about 52,000 metric tons. A Government program designed to increase the area devoted to peanuts by at least 10 percent in 1963 was not completely successful, and the 1963 crop is forecast at 55,000 metric tons. Large imports of crude peanut oil are expected to continue for at least the next year or two.

Root Crops

Yuca, sweetpotatoes, and yams, important items in the diet of the rural population, are grown throughout the country primarily for local consumption. Almost every small farm has its little patch of one or more of these crops. Large quantities of these crops are consumed in urban areas also, especially by the low-income groups. Outdated cultural practices are generally followed in producing these crops; fertilizers, sprays, and similar production aids are rarely used.

Other Food Crops

Other fruits and vegetables grown principally for local consumption include beans, peas, tomatoes, plantains, coconuts, pineapples, mangoes, and oranges. Small quantities of these products are normally exported, principally to neighboring islands.

Vegetable Fibers

For some time the Dominican Republic has shown considerable interest in developing its cotton production. In the mid-1950's the Government passed a resolution which provided financial and technical assistance to the textile industry. Under the terms of this resolution the industry was exempted from paying any type of surcharge, duty or tax, on agricultural machinery, transportation equipment, and any other instrument necessary for developing and operating the cotton production program. Until 1959/60, production of cotton, for all practical purposes, was on an experimental basis. That year output expanded sharply and totaled about 1,000 metric tons. Production continued to increase in 1960/61 and 1961/62 crop years with exports totaling about 1,500 metric tons annually during this period. The Dominican Republic is expected to continue expanding cotton production. Exports may increase substantially above the current levels.

Small quantities of henequen and sisal are exported, but the value of these exports has dropped sharply since 1958, and totaled only $12,000 in 1961. There have been no new plantings of sisal of any consequence in the Dominican Republic during the past 2 or 3 years. As a result, a large part of the domestic requirements for fiber was met by imports from Haiti and Mexico in 1962. The failure of the sisal industry to prosper has been attributed to a miscalculation of the amount of rainfall in the planted areas, defective planting stock, the prevalence of insect pests and diseases, and high labor costs. It is reported that all of the present sisal area will eventually be diverted to the production of cotton, except for an experimental plot of about 100 hectares which will be used to produce kenaf fiber on an experimental basis.

Livestock and Poultry Production

Livestock raising is one of the most important economic activities in the Dominican Republic. It is expected to play a major role in future agricultural diversification and development programs. Production of cattle has special promise because of the combination of suitable land and climate.

Cattle

Largely because of the increased purchasing power of the Dominican people, meat consumption expanded sharply in 1962. According to government reports, excessive slaughtering in response to demand, combined with the clandestine killing of some cattle formerly owned by the Trujillos, has resulted in a serious reduction in cattle numbers, including breeding stock. Exports of beef, practically all to Puerto Rico in the past, were curtailed in mid-1962. It is unlikely that beef exports will be of any significance for at least 4 to 5 years, the length of time necessary to rebuild the herds.

In August 1962, the Dominican Government launched a comprehensive livestock development program. The program includes plans to import 20,000 head of breeding cattle during the next 2 years to upgrade the local stock. Plans also call for a large-scale pasture development program and a campaign to reduce livestock losses from animal diseases and parasites.

The Inter-American Development Bank is presently considering a request from the Dominican Agricultural Bank for a $6 million loan for livestock and poultry development. The Dominican Government is providing $5 million from its own funds to implement the program.

Because of its geographic location, the Dominican Republic has many natural advantages as a cattle-raising country. They include the mild climate which permits animals to be pastured the year round without protection against extreme weather, large natural grazing areas, and adequate and fairly well distributed rainfall in the chief cattle-producing regions. The chief disadvantage is the subtropical climate which aggrevates certain diseases and parasites in cattle and requires a careful selection of adaptable breeds.

The 1950 agricultural census showed that 26 percent of the land in farms was managed pasturelands and another 12 percent unmanaged permanent pasturelands. The criteria for this breakdown are not fully known, but well-managed pastures are rare. Controlled grazing is critically needed, for undergrazing during periods of swift pasture growth results in an overgrowth of low protein, nonpalatable feed, and overgrazing during periods of scanty rainfall frequently kills available grass. The principal grasses are Guinea and Pangola, with about half

of the pastureland in the former and about one-third in the latter. Pangolagrass, which has a very high livestock carrying capacity when managed properly, is being established on the better soils without difficulty.

The Dominican cattle, mostly crossbreds with considerable native and Brahman blood, are hearty, tick resistant, and well adapted to the local environment. The Santa Gertrudis, Brangus, Brown Swiss, and Holstein breeds also perform well in the country (fig. 14).

Figure 14.--Cattle grazing in typical pasture near Santo Domingo.

While some excellent herds exist, they are in the minority as the general run of cattle are well below the standard which could be developed fairly easily through improved management.

Cattle are usually sold for slaughter direct from pasture, without receiving any other feed. Consequently, this dependence on pasture feeding greatly lengthens the time necessary to bring cattle up to slaughter weight. Additional quantities of preserved roughage, such as hay or silage, are needed during dry periods when grass is short and scarce. Better management of pastures, along with construction of trench silos is being encouraged. Feeding of grains has expanded in recent years, and a greater number of farmers are adopting this practice.

Cattle numbers remained fairly stable during the two decades 1930-50, but increased about 15 percent during the 1950's. The Agricultural Census of 1960 showed a cattle population of 1,002,139 head (fig. 15). Present programs plan to increase cattle numbers substantially during the next 5 years or so aided by large imports of purebred breeding stock.

Hogs

Few Dominican farmers specialize in swine raising, but practically all have a hog or two. Suitable feed for hogs is not as abundant or as cheap as pasture for cattle, and many of the animals are left to forage for themselves. Supplementary feeds consist mostly of palmiche nuts (from the royal palm) which are high in protein and fat, along with table scraps and any other available feed. Only rarely has large quantities of corn been fed to hogs.

Hog numbers rose sharply in the 1940's, from 783,015 in 1940 to 1,157,562 in 1950. However, unlike cattle, hogs did not increase in number during the decade 1950-60 (fig. 16).

Dominican pork is generally poor in quality. Carcasses are found to be frequently soft, oily, and poorly finished. These characteristics are attributable not only to the type of animal but also to poor feeding. Although increasing quantities of grains are being fed to hogs, additional amounts of balanced concentrates are needed if the quality of the pork is to be improved.

The livestock development program is planning a breeding service for hogs and a hog-cholera eradication program. Number of hogs, like the number of cattle, have declined in the last 2 years principally because of the increased demand for meat. Although strong efforts are being made to increase the hog population in order to meet the growing market for pork, it is not likely that this can be done within the next 3-4 years.

Other Livestock

Improved roads have permitted more areas to use automotive vehicles, but practically all farmers still use horses, mules, and donkeys for transport. Horses are generally used for riding, while mules and donkeys are used for hauling and light farmwork in addition to riding. According to the 1960 census, there were 252,673 horses in the country, a slight increase over the 1950 census. The number of mules and donkeys in 1950 (the latest data) totaled 69,044 head and 128,203 head, respectively.

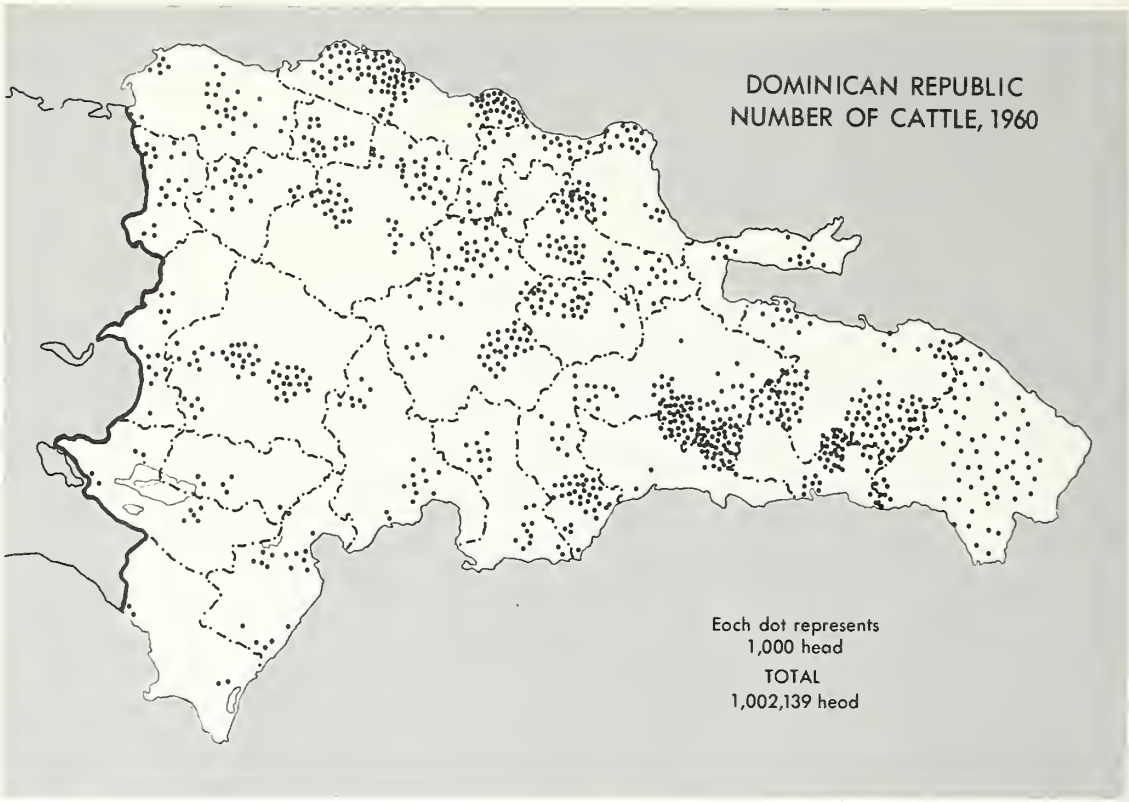
Goats are generally kept on small subsistence farms. They are also kept by poor families on the outskirts of the cities. The small herds, which furnish both meat and milk, are rarely fed hay or grain, but graze on whatever pasture is available. Goats numbered 596,406 in 1950, and the number has probably changed little since.

Sheep are not well adapted to the subtropical climate of the country. In 1950, they numbered only 48,934 head. They are kept primarily for mutton since the wool growth is usually not sufficient to warrant shearing.

Poultry

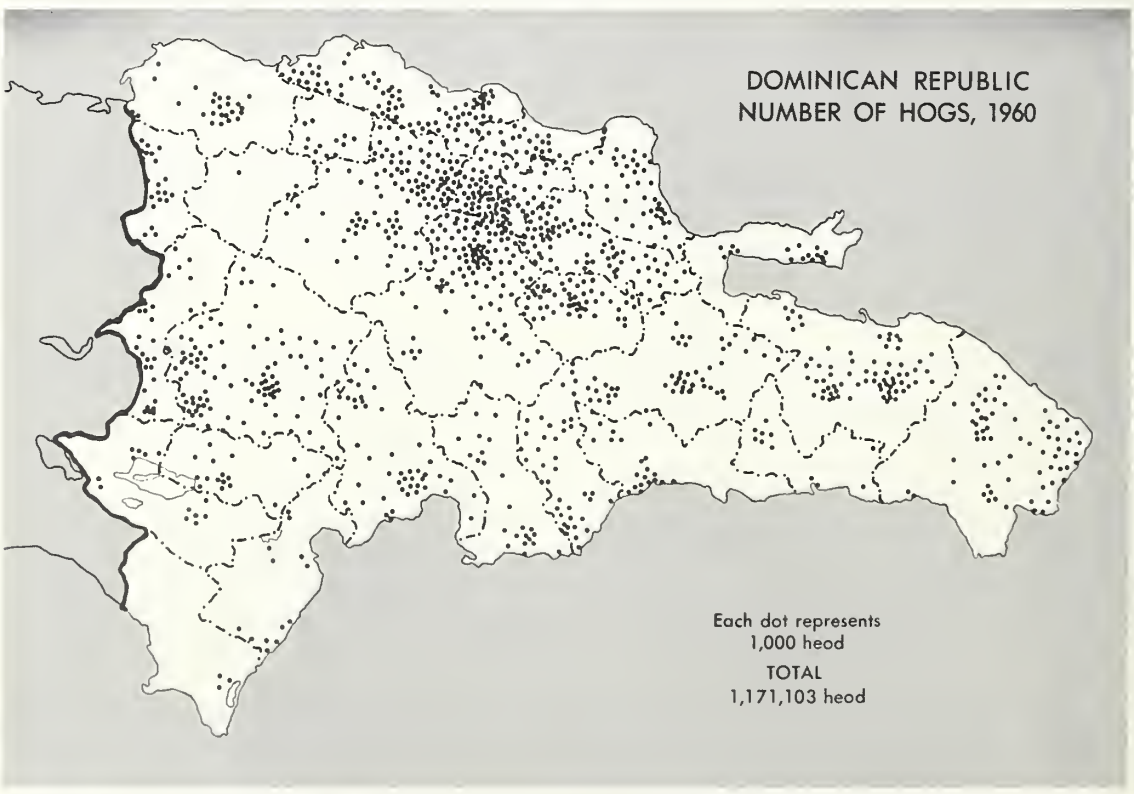
Poultry raising in the Dominican Republic is widespread and the rural home is rare that does not have chickens. Turkeys, guinea hens, and ducks are frequently raised along with the chickens. The 1950 agricultural census (the latest available data) gave the following figures: chickens 5,744,327; turkeys 118,996; ducks, 61,970; guinea hens, 50,099; and geese, 3,572.

Poultry production is receiving priority under the agricultural diversification program. Both poultry meat and egg output are expected to rise substantially in the future if the problems of diseases and an adequate feed supply can be solved. Chickens, which are mostly small native



U.S. Department of Agriculture Neg. ERS 1550-62 (11) Economic Research Service

Figure 15



U.S. Department of Agriculture Neg. ERS 1551-62 (11) Economic Research Service

Figure 16

stock called "criollos," receive little or no improved management. They are allowed to run freely over the farmstead, living mostly on insects and plant life. Frequently, disease wipes out the entire flock.

High retail prices of poultry meat and eggs place these items out of reach of the average consumer. Prices of poultry meat in mid-1962 averaged 65 cents per pound and of eggs 65 cents per dozen. Poultry meat imported from the United States is priced even higher, normally selling for 5 to 10 cents per pound above the local product.

Large numbers of broiler chicks are currently being flown in from the United States. They are being raised in plants near the capital city, which is by far the major market. Also, increasing quantities of frozen poultry meat are being purchased from the United States.

A principal obstacle to expansion of the poultry industry in the Dominican Republic is the high cost of mixed concentrates. Locally produced 18-percent laying mash sells for about $5.00 per cwt., and 20-percent growing mash, $5.20 per cwt. Imported mixed concentrates for poultry are sold at even higher prices, ranging from $7 to $10 per cwt.

Animal Products

The Dominican Republic's livestock industry is in part highly commercialized and in part close to subsistence in type. Meat, for example, comes from animals butchered in slaughterhouses ranging from the modern refrigerated packing plant in Santo Domingo down to small, crude rural slaughter sheds whose output along with that of farm-slaughtered animals is consumed locally. Much of the milk, poultry, and egg supply is also consumed close to the point of production.

Cattle provide most of the meat produced in the Dominican Republic. It is estimated that beef and veal together make up about 60 percent of all meat, including poultry, produced in the country. Sizable numbers of live animals and quantities of beef have also been exported. Exports of cattle in the period 1958-60 averaged almost 12,000 head annually; exports of beef during the same period averaged 2,300 metric tons. Total production of beef and veal in 1961 was estimated at 20,000 metric tons. Cattle slaughtered during the period 1950-60 is shown in table 6. Because of the decrease in cattle numbers, production of beef has declined since mid-1962, and meat supplies are short.

Pork and poultry are the other important meats produced. Hog slaughter and pork production remained fairly stable during the 1950's. Although no reliable figures are available at this time on the quantity of pork and poultry meat produced, output is roughly estimated at 8,000 metric tons for pork and about 4,000 to 6,000 metric tons of poultry meat annually.

The dairy industry is largely undeveloped and whole milk consumption, estimated at about 55 kilograms per person per year, is lower than the average for other Latin American Republics. Consumption of milk is mostly limited to the larger towns and cities, particularly Santo Domingo and Santiago.

A modern pasteurization plant in Santo Domingo receives about 30,000 liters of milk daily for which it pays producers about 15 U. S. cents per liter. A creamery and condensary is operated in connection with the pasteurization plant. In 1960, 1.116 metric tons of cheese, 236 tons of butter, 595 tons of ice cream, and 18 tons of canned condensed milk were factory produced.

Table 6.--Dominican Republic: Cattle and hog slaughter, 1950-54 average, annual 1955-60

Year or period	Cattle	Hogs
	Number	Number
1950-54 average	113,370	193,620
1955	113,992	188,106
1956	117,805	187,762
1957	120,118	186,748
1958	142,152	192,012
1959	145,462	194,635
1960	140,186	185,751

Source: Fifth National Agricultural Census 1960, Preliminary data.

Imports of dairy products, about half originating in the United States, increased sharply in 1962 over the low levels of 1961. While statistics are not yet available for the entire year, imports of dairy products during the 8-month period January-August totaled about $470,000 compared with $158,189 for calendar year 1961. Exports of dairy products consist of only small quantities of cheese.

With the exception of a few improved dairy herds near Santo Domingo, there is no general demarcation between dairy and beef animals. The criolla cow is milked until it becomes more economical to send her to slaughter. Most estimates place the number of cows now being milked at approximately 185,000 head. While no reliable figures are available, it is not likely that average daily production exceeds 3 liters per head. Most of the cows are milked only once daily, usually early in the morning. The milk is then taken to market before the heat of the day can cause it to deteriorate.

Low milk production is largely the result of widespread diseases and parasites (see Animal Diseases). Inadequate feeding, particularly during periods of low rainfall, is another major contributing factor to low production.

Plans for importing sizable numbers of dairy breeding stock are included in the livestock development program that was launched in 1962. Increased production through better breeding will take several years to show results. On the other hand, better disease and pest control coupled with improved feeding could show almost immediate gains. Greater attention also needs to be given to sanitation, transportation, and refrigeration in order to reduce losses due to poor marketing facilities and to provide incentives to farmers to adopt improved management practices, such as twice daily milking.

Animal Diseases

Like many Latin American countries, the Dominican Republic suffers severe livestock losses from a large number of animal diseases and parasite infestations. Parasites, particularly, reduce the productivity of livestock, and, except on a few of the more modern ranches and dairy farms, little progress has been made in controlling them.

Many of the diseases of major public health significance, such as brucellosis and tuberculosis, are widespread, and efforts made to control or eradicate them have been inadequate.

It was estimated in early 1962 that some 20 percent of the cows on the milk-producing farms of the country have brucellosis and 5-percent of them tuberculosis. In some areas the percentages are even higher.

Ectoparasities cause heavy losses in livestock both in irritating effect and in transmitting diseases such as anaplasmosis and piroplasmosis. A few of the more progressive ranches have installed dipping or spray facilities to combat flies and ticks, but the majority of the cattle are exposed to constant infestation. The high degree of tick infestation has forced many cattlemen to rely on the more tick-resistant Brahman and Brahman crosses.

The most serious swine disease is hog cholera. It has an estimated mortality rate of some 30 to 40 percent a year as swine raisers vaccinate less than 2 percent of all hogs. Internal parasites also seriously curtail efficient hog production.

Newcastle disease constantly threatens the poultry industry; prevention through vaccination is too costly for the small rural flocks, and is often neglected. This disease causes an estimated mortality of over 40 percent a year.

The veterinary services of the Dominican Republic have contributed little to effective disease control in the past, due largely to lack of government support and inefficient organization. A Department of Veterinary Medicine was established at the University of Santo Domingo in 1955, but the training has never reached adequate standards. Only a few of the provinces have established local veterinary services and only one veterinary laboratory, located near Santo Domingo, exists in the Dominican Republic. Current equipment and facilities limit the extent of diagnostic and investigational work, but plans are underway to obtain some modern equipment and to improve facilities.

There is a current critical shortage of veterinarians in the country, and substantial effort will have to be made to correct this situation if the planned livestock and poultry development programs are to succeed.

Forestry

Forests cover an estimated 45 percent of the total land area of the Dominican Republic, and a wide variety of forest products are produced.

Valuable cabinet and dye woods have been exploited almost since the country's discovery, but today their production is relatively small. Mahogany, once sought after for the construction of cathedrals and galleons, is no longer a significant export item. While these valuable hardwood species are still present in the so-called inaccessible forests, their low density makes logging expensive.

The chief interest today centers in the pine forests (covering some 875,000 hectares) of the Central Cordillera. This pine (Pinus occidentalis) is similar in its properties and uses to the yellow pines found in the southern United States. Since 1940, production of pine lumber has doubled. In 1960, it totaled 20-million square feet (about 36,000 metric tons).

Because of a lack of hard surface access roads in the country, hauling the logs to the sawmills is a major problem. Logging operations are frequently interrupted by rains which make the available roads impassable. The only river used for transportating logs is the Yaque del Norte.

The forests of the Dominican Republic, particularly the pine forests, have been disappearing at a sharp rate in the last few years because of uncontrolled burning and clearing by squatters. Loss of this resource is not only destroying a potentially important source of foreign exchange, but is also removing the protective cover of watersheds in areas where development projects are in progress or under consideration.

In view of the critical need, the Government recently established a National Forest Service. Necessary personnel are currently being trained to carry out programs of fire control, policing, conservation, reforestation, and rational utilization of forest reserves.

The Dominican Government has also contracted with AID for the services of several technicians from the U. S. Forest Service to conduct a forest inventory and a study of the lumber industry.

The country is practically self sufficient in lumber production. Exports of forest products totaled 5,497 metric tons in 1961 at a value of $491,000. About two-thirds of these exports were lignum-vitae, and most of the rest was pine lumber.

FOOD SUPPLY AND CONSUMPTION

According to the Dominican Government, 128,141 workers in industrial and commercial firms received wage increases of up to 60 percent in the year ending June 30, 1962, the average increase being 34 percent. These wages increases, combined with the drop in unemployment brought about by implementing an emergency works program, were accompanied by a smaller rise in the cost of living and resulted in increased food consumption. Since June 1962, relatively high employment has continued, and industrial and commercial wages have remained fairly stable. However, there has been a slight increase in the cost of living (table 7).

Sales of certain basic foods during the first half of 1962 surpassed those of the same period of 1961 by a substantial margin. The increases were on the order of 93 percent for rice and 79 percent for edible oil. Sales after mid-year continued at high levels. For example, sales of wheat flour (100-pound sacks) in the period January-September 30, 1962, totaled 511,023 sacks in comparison to 325,780 sacks for the similar period of 1961. The one flour mill (Molinos Dominicanos) during this period worked three 8-hour shifts a day, 5-1/2 days a week, and had plans for installing new machinery which is expected to increase capacity some 10 percent. Demand for meat, beans, and other food has also increased sharply resulting in shortages and, for many items, higher prices (table 8).

To ease the critical food supply situation the Catholic Relief Service began a food distribution program in late 1961 using U. S. farm products donated under Title III, Public Law 480. This program, doubled in March 1962, is continuing to expand. It now provides food for some 300,000 persons. In July 1962, CARE signed a contract with the Dominican Government to provide a school lunch program for the school year beginning in September 1962. The program began by feeding about 30,000 students, again using P. L. 480, Title III food, but the program was gradually expanded and was feeding about 140,000 students by the end of the school year. Plans call for feeding 300,000 students by the end of the 1964 school year. A social service program began in October 1962 by the Church World Service, and is currently providing food for some 20,000 persons.

Average per capita food consumption in the Dominican Republic during the decade 1950-60 was among the lowest in Latin America and well below the minimum nutritional requirement. The

Table 7.--Index numbers: Retail prices, wholesale prices, and cost of living Santo Domingo, Dominican Republic, annually 1950-61, monthly 1962

Year and month	Retail prices 1936-39=100	Wholesale prices 1941=100	Cost of living 1941=100
1950	232.5	235.2	219.7
1951	263.8	260.9	238.3
1952	267.7	267.4	240.6
1953	264.5	266.7	237.2
1954	260.3	252.0	232.4
1955	258.8	254.4	232.4
1956	257.9	251.5	235.5
1957	281.8	276.0	246.9
1958	271.6	273.7	242.1
1959	263.4	258.0	241.8
1960	255.3	267.7	233.0
1961	252.5	249.5	224.1
1962:			
January	261.6	257.7	237.5
February	263.2	270.1	239.6
March	269.4	258.2	245.9
April	278.9	270.2	249.1
May	281.8	275.1	252.3
June	278.2	275.6	250.9
July	282.4	275.6	250.2
August	280.6	282.1	250.3
September	278.9	281.1	250.0
October	278.2	280.5	248.2
November	278.3	277.0	249.3
December	281.4	284.5	252.3

Source: Boletin Mensual. Banco Central de la Republica Dominicana. October-December 1962.

average per capita daily diet, estimated to contain 1,950 calories in 1958, was deficient not only in calories but in protein as well. Almost half the calories were supplied by sugar, tubers, bananas, and plantains. On the other hand, less than 10 percent of the calories came from meat, milk, eggs, cheese, and fish combined.

Inadequacy of the Dominican diet may be attributed to several factors: Low purchasing power, habit, and traditions of the people; deficiency in transportation which restricts movement of foodstuffs from surplus to deficient areas; and lack of storage facilities to carry over food supplies from flush to lean years or even to maintain stable supplies throughout one consumption year.

Rice, corn, and cassava (yuca) are the staple foods. Potatoes are grown and consumed at the higher altitudes, while sweetpotatoes, plantains, and bananas are important sources of carbohydrates at lower elevations. Wheat flour is consumed principally by urban dwellers. Meat and fat consumption is greater in the cities and in the cattle-producing areas. Substantial quantities of both wild and cultivated fruits and vegetables are eaten in season.

Table 8.--Index numbers: Prices of selected foodstuffs, Dominican Republic, 1961 and (January-November) 1962

(1960 = 100)

Year and month	Rice per pound	Beans per pound	Bananas per dozen	Potatoes per pound	Beef per pound	Eggs, each	Fresh milk per botella 1/	Peanut oil per botella 1/	Wheat bread per pound
Average 1960 price-(cents)	14.6	13.3	11.2	10.0	36.3	5.0	16.6	63.1	9.0
1961:									
January	99	83	107	100	96	100	90	101	178
February	99	86	107	100	102	80	90	103	178
March	103	90	110	73	110	100	87	89	267
April	106	90	107	45	110	90	86	103	267
May	106	105	107	45	103	90	84	101	356
June	68	130	89	45	99	110	70	103	333
July	68	113	103	40	110	110	78	101	333
August	68	105	107	50	110	110	70	101	333
September	68	105	107	50	110	110	72	101	333
October	68	143	98	60	110	110	70	101	333
November	68	86	110	100	110	140	69	101	333
December	68	86	110	100	110	140	69	63	333
1962:									
January	75	83	107	120	77	120	72	63	377
February	75	100	89	100	74	120	84	95	377
March	75	105	125	110	77	120	78	95	377
April	75	128	125	110	74	120	90	95	377
May	75	120	110	115	74	130	87	95	377
June	77	124	128	110	80	140	88	95	377
July	82	107	110	140	83	124	87	107	333
August	89	120	134	120	83	120	84	95	333
September	82	113	134	120	96	100	84	95	333
October	86	113	125	100	93	120	73	91	333
November	82	113	121	100	77	120	78	95	333

1/ Botella = 0.76 quart.

Source: Boletin Mensual. Banco Central de la Republica Dominicana. October-December 1962.

FOREIGN TRADE

The recent sharp rise in the world price for sugar, the major export commodity of the Dominican Republic, and the expanded financial assistance being received from the United States and other sources have resulted in a rapid expansion in the value of the Dominican Republic's foreign trade.

Dominican exports during 1962 reached $172.5 million, up one-fifth from the 1961 total. 2/ Imports increased by an even wider margin, from $69 million in 1961 to $127.3 million in 1962. Further increases in both foreign purchases and sales are forecast for 1963.

Dominican exports of sugar and sugar byproducts in 1962, valued at $96.9 million, represented almost 60 percent of total exports. 2/ Income from sugar sales in 1963 is expected to be even greater than last year. While sugar production is expected to be less than in 1962, the increase in the price received for exports will likely more than offset the decline.

Recent receipt of substantial long-term capital will further increase the import capability of the Dominican Republic. In 1962, several long-term loan and grant agreements were signed. Among the loan agreements were a $25 million credit from AID, a $10 million line of credit from the Export-Import Bank, $6.5 million in loans from the Inter-American Development Bank, and a P. L. 480, Title IV loan of $4.5 million to finance rice imports. Only about one-third of the total value of these loans had been drawn down by the end of 1962.

In addition, an agreement was signed in March 1963 whereby the Dominican Republic will receive $22.75 million from the United States collected from the sanctions fee imposed by the United States on sugar imports from the Dominican Republic in 1960 and 1961.

The upward surge of Dominican imports in 1962 reflects the liberalization of Dominican import restrictions, the expanded effective demand of the population as a whole, and virtual exhaustion of consumer goods inventories in the country at the beginning of the year. According to estimates of the Dominican Central Bank, imports in 1963 are expected to rise to a total of $160 million.

During most of the past two decades United States-Dominican trade was well balanced (table 9 and fig. 17). However, U. S. exports to the Dominican Republic, both total and agricultural, dropped sharply in 1959, 1960, and again in 1961. Chiefly responsible for the decline was the economic depression, the restrictions on imports, and the economic sanctions placed on the Trujillo Government by the Organization of American States. Since January 1962 when these sanctions were lifted, purchases from the United States have increased sharply (table 10).

Agricultural Exports

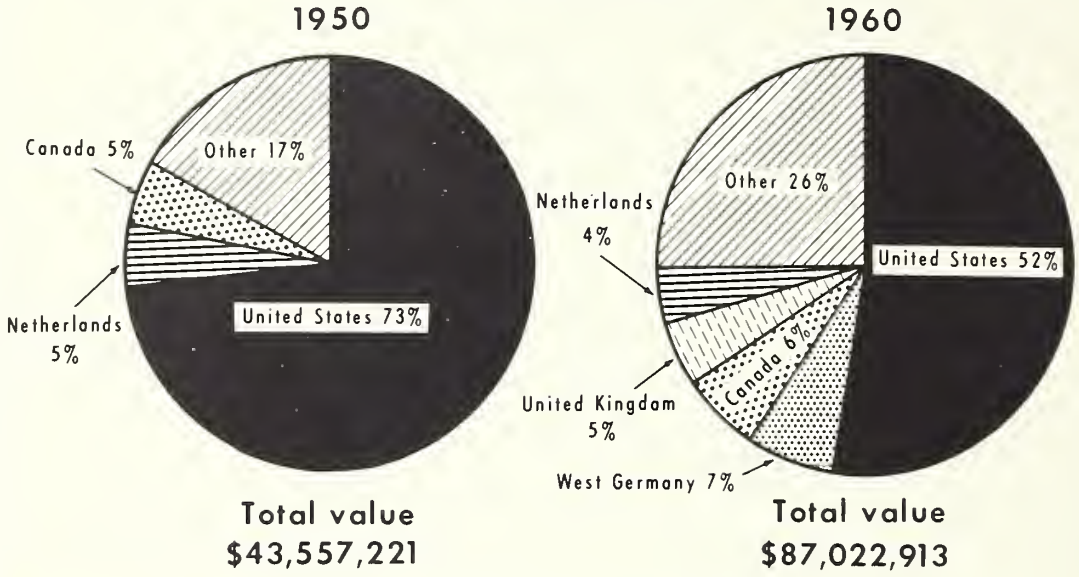
Agricultural products normally make up nine-tenths of total Dominican exports (table 11). With the exception of relatively small quantities of corn, rice, cotton, and beef, these exports are complementary to those of the United States.

Sugar is the key export of the Dominican Republic, one of the world's largest exporters of sugar. Since the United States ceased buying Cuban sugar in mid-1960, the position of the Dominican Republic in the U. S. sugar market has risen sharply. Practically all of the sugar marketed abroad in 1962 went to the United States at premium prices.

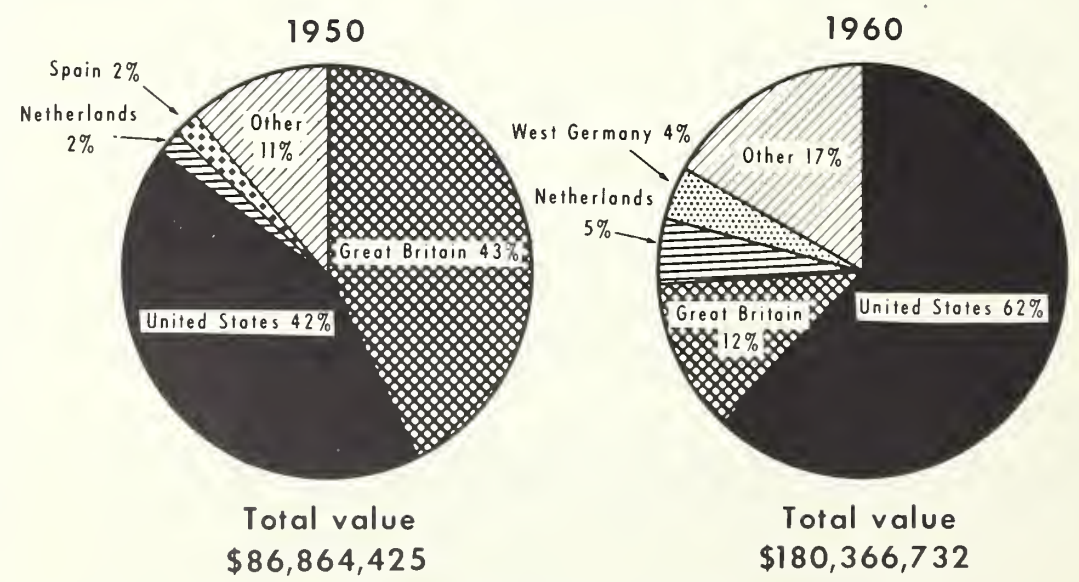
2/ All 1962 trade data are preliminary.

DOMINICAN REPUBLIC: DISTRIBUTION OF TOTAL TRADE, 1950 AND 1960

IMPORTS



EXPORTS



SOURCE: COMERCIO EXTERIOR DE LA REPUBLICA DOMINICANA.

U. S. DEPARTMENT OF AGRICULTURE NEG. ERS 2130-63(6) ECONOMIC RESEARCH SERVICE

Figure 17

Table 9.--U. S. trade: Value of exports and imports, Dominican Republic, 5-year averages 1935-54, annual 1955-62

Year	U. S. exports		U. S. imports	
	Total	Agricultural	Total	Agricultural
	Mil. dol.	Mil. dol.	Mil. dol.	Mil. dol.
Average:				
1935-39	5.5	0.7	5.9	5.6
1940-44	10.1	1.1	10.4	9.8
1945-49	36.3	3.7	25.1	23.9
1950-54	48.3	5.0	53.3	52.0
1955	59.9	4.8	62.2	58.5
1956	67.1	5.1	60.1	54.8
1957	73.9	6.0	63.0	55.7
1958	75.7	5.8	71.8	66.2
1959	59.5	5.7	75.2	62.3
1960	41.2	4.1	110.2	96.3
1961	29.1	2.5	88.4	76.2
1962 1/	70.3	9.9	154.4	140.0

1/ Preliminary.

Source: U. S. Department of Commerce, Bureau of the Census.

Under the 1962 United States Sugar Act Amendments, the quota for the Dominican Republic is 322,152 short tons of sugar for calendar years 1963 and 1964. In addition, the Dominican Republic receives 2.3485 percent of any growth in U. S. market requirements above 9.8 million short tons and may participate in filling the "global" quota and also quota deficits of domestic U. S. areas and of foreign suppliers. As of June 30, 1963, enough Dominican sugar in addition to the basic country quota had already been approved to bring the total for 1963 to about 600,000 short tons. This combined with the recent rise in the world market price for sugar will assist the country in maintaining a high income for sugar exports for at least the near future.

Coffee ranks second among export crops; and of this, too, the largest share--about 80 percent--goes to the United States. Cocoa, bananas, and tobacco are the other top farm exports. Cocoa, most valuable of the three, goes almost entirely to the United States, which also takes many of the bananas and an increasing share of the tobacco.

Agricultural Imports

The Dominican Republic imports a wide variety of farm products (table 12). Agricultural commodities normally account for 8 to 10 percent of total imports with about six-tenths coming from the United States and most of the rest originating in Canada (table 13). Agricultural imports declined in 1959, 1960, and again in 1961 after trending upward for several years, but rebounded sharply in 1962.

Wheat flour was traditionally the principal agricultural import until the completion of a modern flour mill in Santo Domingo in 1960. Since then wheat has replaced flour as the leading

Table 10.--U. S. trade in agricultural products: Value of exports and imports, Dominican Republic 1959-62

Product	U. S. exports			
	1959	1960	1961	1962
	1,000 dol.	1,000 dol.	1,000 dol.	1,000 dol.
Wheat grain	78	814	406	826
Wheat flour	1,473	644	14	124
Other grains and preparations	979	634	323	1,871
Vegetables and preparations	536	419	323	1,212
Fruits and preparations	513	324	233	705
Cattle, breeding	501	43	50	194
Tallow, inedible	474	431	397	582
Dairy products	248	149	117	302
Cotton	17	---	47	25
Meats and meat food products	144	103	58	438
Other agricultural	785	502	574	3,632
Total agricultural	5,748	4,063	2,542	9,911
	U. S. imports			
Coffee	15,056	19,096	11,386	16,988
Cocao beans	14,738	14,297	4,865	7,621
Chocolate	5,349	5,134	4,962	3,458
Sugar	14,130	43,058	35,046	96,723
Molasses	5,110	4,437	5,394	6,453
Bananas and plantains	3,474	4,235	2,629	1,447
Corn	1,220	1,123	1,089	1,025
Fresh beef	1,744	1,861	1,266	266
Cocao butter	37	606	3,224	2,056
Other agricultural	1,417	2,444	3,311	3,961
Total agricultural	62,275	96,291	73,172	140,028

Source: U. S. Department of Commerce, Bureau of the Census.

farm import. Purchases of wheat and flour almost doubled during the decade 1950-60 and are continuing to expand at a rapid pace. Most of the wheat flour is consumed in Santo Domingo but increasingly large quantities are being marketed in other cities and in rural areas.

Other important farm imports are cereal preparations, fresh and canned fruits and vegetables, prepared and condensed milk, tallow, olive oil, canned meats, and live animals for breeding.

AGRICULTURAL AND TRADE PROSPECTS

A substantial rate of increase in agricultural productivity in the Dominican Republic can be achieved largely through the more effective use of resources already committed to the agricultural sector. The country has the productive land base, favorable climate, and labor supply but investment of capital and technology in agriculture in the past has been inadequate and limited largely to the major export crops.

Table 11.--Agricultural exports: Quantity and value of principal agricultural exports, Dominican Republic, averages 1950-54, 1955-58, annual 1959-61

Commodity product	Average				1959		1960		1961	
	1950-54		1955-58							
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars
Sugar, raw 1/	506,544	47,460	652,855	60,002	670,130	49,714	1,101,505	89,211	761,344	61,578
Cane molasses, inedible	146,163	3,049	177,062	3,677	212,690	4,417	366,456	4,631	295,169	5,554
Cocoa beans	23,247	16,812	22,047	14,961	21,722	15,107	26,129	13,942	11,696	5,025
Chocolate	6,521	5,427	8,155	6,446	8,492	7,144	8,748	5,721	10,398	5,572
Coffee, raw 2/	20,742	22,607	24,587	27,509	21,870	17,514	29,241	22,576	20,094	14,353
Tobacco, leaf	13,500	4,906	12,358	4,988	12,238	5,194	15,194	6,734	21,960	9,462
Bananas and plantains	42,180	1,527	56,859	3,047	102,050	6,076	181,571	11,323	170,231	11,771
Other agricultural	---	5,385	---	7,457	---	11,322	---	10,326	---	13,052
Total agricultural	---	107,173	---	128,087	---	116,331	---	164,480	---	126,367
All exports	---	109,198	---	134,260	---	130,136	---	180,367	---	143,148

1/ Includes refined sugar in terms of raw equivalent (factor 1.07).

2/ Includes roasted coffee in terms of green coffee (factor 1.19).

Source: Anuario Estadisticas de la Republica Dominicana 1951 and 1952. Comercio Exterior de la Republica Dominicana. Various issues.

Table 12.--Agricultural imports: Quantity and value of principal agricultural imports, Dominican Republic, averages 1950-54, 1955-58, annual 1959-61

Product	Average				1959		1960		1961	
	1950-54		1955-58							
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars	Metric tons	1,000 dollars
Wheat	1,353	85	1,366	91	1,333	110	29,387	2,031	33,115	2,209
Wheat flour	16,094	1,881	20,699	2,185	23,705	2,456	7,317	814	32	6
Cereal preparations	2,903	478	3,976	615	5,415	745	2,591	420	1,233	219
Meats, including canned	281	301	390	415	400	409	222	271	124	161
Fruits, fresh and canned	832	230	850	275	797	257	675	214	210	74
Vegetables, fresh and canned	3,629	604	5,377	947	3,862	745	4,050	770	2,559	518
Milk, condensed, malted and fresh	975	507	1,571	848	695	433	127	117	188	113
Tallow	1,972	357	1,909	352	2,789	465	2,812	435	3,739	435
Nuts	65	35	1,784	356	3,115	499	61	36	60	32
Other agricultural	---	2,437	---	3,221	---	3,284	---	2,090	---	1,791
Total agricultural	---	6,915	---	9,305	---	9,403	---	7,198	---	5,558
Total imports	---	73,742	---	113,083	---	117,538	---	87,023	---	69,489

Source: Anuario Estadisticas de la Republica Dominicana 1951, 1952. Comercio Exterior de la Republica Dominicana, Various issues.

Table 13.--Agricultural imports: Quantity and value of principal agricultural imports, by country of origin, Dominican Republic, 1960 and 1961

Commodity and country of origin	1960		1961	
	Quantity	Value	Quantity	Value
	Metric tons	$1,000	Metric tons	$1,000
Wheat	29,387	2,031	33,115	2,209
Canada	16,359	1,110	27,090	1,814
United States	13,028	921	6,025	395
Wheat flour	7,317	814	32	6
Canada	960	106	0	0
United States	6,311	705	32	6
Other	46	3	0	0
Cereal preparations	2,591	420	1,233	219
United States	1,328	258	803	149
Canada	797	92	90	21
Denmark	200	30	134	18
Netherlands	198	31	173	27
Other	68	9	33	4
Meats, including canned	222	271	124	161
United States	115	133	50	72
Denmark	80	81	55	56
Other	27	47	19	33
Fruits, fresh and canned	675	214	210	74
United States	624	201	189	66
Other	51	13	21	8
Vegetables, fresh and canned	4,050	770	2,559	518
United States	1,687	245	1,009	153
Italy	1,711	402	904	240
Spain	181	31	213	46
Mexico	277	60	273	41
Other	194	32	160	38
Tallow, inedible	2,812	435	3,739	435
United States	2,758	428	3,577	416
West Germany	38	4	162	19
Other	16	3	0	0
Milk, condensed, malted and fresh	127	117	188	113
United States	86	96	67	76
Netherlands	18	11	107	31
Canada	13	4	13	5
Other	10	6	1	1

Source: Comercio Exterior de la Republica Dominicana 1960, 1961.

Of particular importance to the future of Dominican agriculture are the new programs for land reform and farm credit. Also significant are the many reconstituted programs for developmental services, such as agricultural extension, education, and research. All these programs are designed to broaden the range of alternative production possibilities available to farm operators and strengthen their capacity to make and to execute decisions on the basis of more adequate knowledge of agricultural technology.

While substantial progress has been made during the past year, it is too early to assess either the potential or the overall results of these programs as several of them are just now getting underway. Perhaps the major obstacle to agricultural development in the Dominican Republic is the critical lack of agricultural technicians and educational facilities. Although this country can draw on the fundamental agricultural research and knowledge accumulated in other countries, the identification of promising avenues of progress and the testing and adoption of improved cultural practices to local conditions are indispensable for realizing the gains that are attainable.

Given a reasonable degree of political and economic stability, the agricultural sector is expected to contribute greatly to the economic development of the country in the immediate years ahead. A primary task is to meet the sharply expanding demand for food. Also, increased agricultural exports could supply a large part of the capital necessary for industrial growth, but diversification of agriculture is necessary to reduce the country's heavy dependence on sugar with its radical price fluctuations on the world market.

Until the growing demand for food can be met by domestic output, large imports will be necessary to stabilize the food supply. The market for U. S. farm products is growing and should continue to expand if competitive prices and quality levels can be maintained. The small proportion of the Dominican population now consuming the products the country imports highlights that there is a large potential market in the country that should develop with any overall improvement of the economy.

SELECTED LIST OF REFERENCES

Banco Central de la Republica Dominicana, Boletin Mensual. Santo Domingo, D. N. October-December 1962.

Brookings Institution. Refugee Settlement in the Dominican Republic. Washington, D. C. 1942.

Direccion General De Estadistica y Censos. Censo Nacional Agropecuario, 1960. Datos Preliminares. Santo Domingo, D. N. 1961.

Flores, Paul S. Basic Data on the Economy of the Dominican Republic. U. S. Dept. Com., Bur. Foreign Com. Washington, D. C. September 1957.

Lankford, James F. Export Crops Show Big Increase in Dominican Republic. U. S. Dept. Agr. Foreign Agr., Vol. 22, No. 2. February 1958.

Mears, Leon G. Dominican Republic Today Is Active Alianza Partner. U. S. Dept. Agr. Foreign Agr., Vol. 26, No. 10. October 1962.

Meyers, Fred I. The Puerto Rico-Dominican Republic Sugar Manual. Gilmore Publishing Co., New Orleans. 1960.

Pan American Union, Division of Agricultural Cooperation. Agriculture in the Dominican Republic. Washington, D. C. February 1943.

Robiou, S. A. Special Report on Climatic Conditions in the Dominican Republic. Meteorological Service, Ciudad Trujillo, D. N. 1941.

U. S. Congress. House. Committee on Agriculture. A Study of the Dominican Republic Agriculture and Sugar Industry. Committee print, 84th Cong., 1st sess. U. S. Govt. Print. Off., Washington, D. C. 1955.

U. S. Department of Agriculture. Food and Agricultural Situation in the Dominican Republic. Foreign Agr. Serv., FATP-2-56. February 1956.

U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce. Agricultural, Pastoral and Forest Industries of the Dominican Republic. Washington, D. C. November 1943.

U. S. Department of Commerce. Economic Developments in the Dominican Republic, 1962. American Republics Div., OBR-63-72. March 1963.

U. S. Department of Commerce. Sugar Sales to U. S. Stimulate Rebounding Dominican Economy. In U. S. Dept. Com., International Commerce. Nov. 26, 1962.

Table 14.--Farms: Number by size of farm, Dominican Republic, 1950 and 1960

Size of farm	1950		1960	
	Farms	Percentage of total farms	Farms	Percentage of total farms
	Number	Percent	Number	Percent
Under 0.2 hectare	25,744	9.3	67,123	15.0
0.2 to 0.6 hectare	22,698	8.2	60,893	13.5
0.6 to 1.0 hectare	46,540	16.8	97,801	21.7
1.0 to 2.0 hectares	57,821	20.9	90,056	20.0
2.0 to 5.0 hectares	58,732	21.2	72,710	16.1
5.0 to 7.0 hectares	21,030	7.6	23,334	5.2
7.0 to 10.1 hectares	11,834	4.3	10,737	2.4
10.1 to 15.1 hectares	10,822	3.9	9,654	2.1
15.1 to 20.1 hectares	6,467	2.3	5,894	1.3
20.1 to 25.2 hectares	2,378	.9	1,671	.4
25.2 to 50.3 hectares	7,400	2.7	6,201	1.4
50.3 to 75.5 hectares	2,109	.8	1,882	.4
75.5 to 100.6 hectares	1,140	.4	748	.2
100.6 to 201.2 hectares	1,213	.4	954	.2
201.2 to 503.1 hectares	578	.2	456	.1
503.1 to 1,006.2 hectares	157	.1	108	1/
1,006.2 to 2,515.6 hectares	124	---	85	1/
Over 2,515.6 hectares	61	---	28	1/
Total	276,848	100.0	450,335	100.0

1/ Less than 0.1 percent.

Source: National Agricultural Census of 1950 and National Agricultural Census of 1960, Preliminary Data.

Table 15.--Rural population and area in farms, by specified province, Dominican Republic, 1950 and 1960

Province	Rural population		Area in farms (hectares)	
	1950	1960	1950	1960
La Altagracia	54,273	69,897	146,579	178,000
Azua	42,039	58,720	23,445	33,173
Baoruco	32,500	37,580	19,752	24,693
Barahona	37,937	45,232	52,459	58,729
Benefactor	93,610	121,870	61,409	93,112
Duarte	94,718	125,930	122,754	115,662
Espaillat	94,123	101,380	71,513	78,088
Independencia	13,737	16,275	8,103	11,871
Julia Molina	48,332	72,864	92,430	104,577
Libertador	22,756	33,106	44,681	52,980
Monte Cristi	30,711	42,433	77,419	110,338
Pedernales	1,909	4,693	5,295	10,585
Puerto Plata	115,365	137,806	162,607	176,379
Salcedo	51,859	59,404	29,812	32,173
Samana	22,732	36,696	39,756	45,282
San Pedro de Macoris	42,710	44,073	109,302	105,958
San Rafael	30,355	38,220	19,612	22,971
Sanchez Ramirez	47,656	86,500	83,790	84,084
Santiago	170,165	192,788	150,022	172,352
Santiago Rodriguez	30,243	35,672	34,394	37,494
El Seibo	86,333	98,066	246,103	270,510
Trujillo	147,462	213,926	209,746	300,198
Trujillo Valdez	65,508	84,099	76,535	84,932
La Vega	162,411	207,401	247,336	278,553
Valverde	30,109	35,774	57,054	55,294
National District	57,911	95,139	90,658	100,606
Total	1,627,464	2,095,544	2,282,566 1/	2,638,594

1/ Revised downward from 2,328,200 since 1950 census.

Source: National Agricultural Census 1960, Preliminary Data.

Table 16.--Rural population and area in farms, Dominican Republic, census years 1920 to 1960

Year	Rural population	Area in farms (hectares)
1920	745,771	1,086,588
1935	1,215,792	1,675,439
1950	1,627,464	2,282,566
1960	2,095,544	2,638,594

Source: National Agricultural Census 1960, Preliminary Data.

Table 17.--Cattle and hogs: Number on farms, by specified province, Dominican Republic, 1950 and 1960

Province	Cattle		Hogs	
	1950	1960	1950	1960
La Altagracia	80,281	76,733	62,487	63,699
Azua	18,187	19,245	43,470	45,003
Baoruco	5,964	5,598	20,769	16,075
Barahona	13,885	17,762	10,998	12,768
Benefactor	43,921	50,963	98,167	94,841
Duarte	38,619	43,952	63,982	73,666
Espaillat	24,205	30,268	54,283	65,844
Independencia	7,945	9,339	13,268	13,188
Julia Molina	25,665	39,868	31,491	41,837
Libertador	18,168	21,292	23,142	21,637
Monte Cristi	30,579	25,819	24,618	24,615
Pedernales	2,357	3,781	2,826	3,545
Puerto Plata	83,262	91,245	73,000	89,826
Salcedo	5,798	6,163	30,376	32,347
Samana	10,127	13,082	17,447	16,553
San Pedro de Macoris	33,803	43,656	13,657	10,950
San Rafael	12,356	12,706	33,144	29,392
Sanchez Ramirez	30,194	32,829	43,509	47,696
Santiago	55,521	56,540	115,205	106,672
Santiago Rodriguez	22,674	19,467	34,072	30,862
El Seibo	111,209	102,611	69,833	69,856
Trujillo	64,281	110,587	96,449	91,256
Trujillo Valdez	16,978	21,857	31,425	23,218
La Vega	62,437	77,759	101,024	112,474
Valverde	22,992	16,949	23,549	13,207
National District	43,929	52,068	62,487	63,699
Total	885,337	1,002,139	1,157,562	1,171,103

Source: National Agricultural Census 1960, Preliminary Data.