LAND UTILIZATION IN WESTMORELAND, JAMAICA: THE INFLUENCE OF PHYSICAL AND SOCIO-ECONOMIC FACTORS ON AGRICULTURE



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> > Ъy

Seto Edward Scott

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ABSTRACT

The primary aims of this study are to analyze the climatic, physiographic, cultural and socio-economic factors which influence land use in Westmoreland. An examination is made of the major characteristics of plantation agriculture, the general economy of Westmoreland, land tenure and its influence on agricultural land use are emphasized. The historical forces influencing land use are studied as well as farm practices, agricultural problems and the attempts which are made to solve them.

A critical assessment is presented of the role of government, social and cultural organizations and institutions in providing credit, marketing facilities and guidance to farmers.

This thesis contains nine chapters. The "Introduction" describes the situation, size and main service centres of Westmoreland. Its chief subsection, "History of Settlement," shows the effects of migration, slavery and emancipation on settlement and the general pattern of land ownership. In addition, this chapter defines some terminology and explains the methods used in this study.

Chapters Two and Three discuss the human and physical resources, respectively. The first analyzes the population structure, its education characteristics,

attitude to manual work, growth trend, and its interrelationship with rural land use.

The nucleus of the thesis, Chapters Four and Five, contains discussions of "Plantation" and "Non-plantation Agriculture." These are defined, analyzed and compared. They include industries connected with agriculture, the technology, care of plants and animals, labour supply, land values and transactions, yield, land tenure and the economics of production.

"Marketing" and the chief "Cultural and Socioeconomic Factors Influencing Agriculture" are discussed in Chapters Six and Seven. The majority of the subdivisions will be listed under "Methodology." Domestic and foreign markets are discussed and the influence of price fluctuations on agricultural production. The role of the Government and social agencies in agriculture is given extensive coverage. Their functions in providing marketing facilities, farmer education, guidance, credit, seeds, fertilizers, subsidies, and land for cultivation and settlement are analyzed and criticized.

Jamaica's major problems are discussed in Chapter Eight with specific examples from Westmoreland. Attempted solutions are examined and suggestions made for their improvement.

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The Ninth Chapter summarizes the chief observations and conclusions. It discusses over-population, limited supply of arable land, under-utilization of physical and human resources, very unequal distribution of land, wealth and income, over-dependence on staple products and unfavourable attitude to manual work as the main problems of Jamaica.

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CHAPTER I

INTRODUCTION

This introduction is used to provide information about the situation and size of Westmoreland; the main centres providing service for farmers, a history of settlement, the methods used in this study and definitions of concepts which needed to be clarified in order to promote an understanding of the thesis.

1. SITUATION AND SIZE

Westmoreland is a parish in the West Indian Island of Jamaica. The parish, located on the southwestern portion of the island, has an area of 320.39 square miles.¹ To the north, it is bordered by the parish of Hanover; Saint James is on its northeast; Saint Elizabeth lies to the southeast; and the Caribbean Sea is the border on the south and west. Longitude 78°10' West of Greenwich passes west of Savanna-la-Mar, the capital of the parish. Little London lies just south of Latitude 18°15', north.

J. Stark, Soil and Land-Use Surveys No. 151, Jamaica, Parish of Westmoreland (Trinidad: The Imperial College of Tropical Agriculture, 1964), p. 4. This parish is one of the fourteen parochial divisions of Jamaica. It is administered for local government purposes from Savanna-la-Mar. Since this township is the service centre most widely used by the population of Westmoreland, the town's site and situation characteristics are related to the other important capitals which are visited by the farmers of the parish.

Montego Bay, Kingston and Spanish Town are the chief townships outside of the parish which are visited by Westmorelanders. These external service centres are listed in order of importance.² (See Map 1.) The primary centres within the parish are Savanna-la-Mar, Grange Hill, Frome, Little London, Seaford Town, Darliston and Bethel Town. Savanna-la-Mar is the service centre most widely used by the farmers of the parish. It is linked by bus route to the most important centres outside of the parish, as is shown by Table III. Savanna-la-Mar is the only centre defined as a town in Westmoreland by the 1960 census. Currently (1968), Grange Hill and Frome may have reached the lower limit (2,000 people) which is necessary for urban status according to that census.

The transportation cost for a single bus fare averages about thirty-three cents (2/6d) within the parish. The range

² Established from questionnaires.



is from 13ϕ (1/-) to 65ϕ (6/-).

TABLE III

ROAD AND TIME DISTANCE FROM SAV-LA-MAR TO THREE TOWNSHIPS³

Townships	Distance in miles	Time dis- tance by bus	Single bus fare	Conditions of roads
Sav-la-Mar to Kingston	145	8 hours	\$1.98 (15/-)	Paved all- purpose
Sav-la-Mar to Montego Bay	42	2 hours	\$.66 (<i>5/-</i>)	Paved all- purpose
Sav-la-Mar to Spanish Town	120	7 hours	\$1.85 (14/-)	Paved all- purpose

A work day is lost by most farmers who visit Sav-la-Mar although it averages two to three hours round trip for travel from most centres of the parish to the town. However, most districts are visited by the same bus twice daily, once in the morning and once each afternoon. As a result, the farmer is forced to wait and lose valuable time which could be used productively.

³ The Jamaican pound had an exchange value of \$2.64 Canadian at the beginning of 1968, when the above calculations were made.

2. SERVICE-CENTRES

Approximately seventy-four percent (74.4%) of the farmers interviewed purchase the facilities they require locally. Furniture is generally bought from Courts Furniture Company and Home Electric Furniture Supplies in Kingston or from manufacturers in Sav-la-Mar. The Kingston suppliers transport furniture on hire-purchase to the homes of customers. Fertilizers, farm implements and tools are obtained from Kingston by the large farmers. Others obtain these commodities from Sav-la-Mar, Darliston, Cambridge and Grange Hill.

As the capital of the parish and because of its proximity to farmers, Sav-la-Mar is visited for its shopping, business, banking, medical and recreational facilities. It has a hospital, doctors, a dentist, lawyers, a court house, four supermarkets, a Parish Council market, a Revenue Office, a police station, clubs and two cinemas. The inhabitants pay their rates, taxes and duties in this capital. This town is therefore the focus of activities for the farming and nonfarm population of the parish.

Goods which are not available in Sav-la-Mar or which are out of stock are purchased in Montego Bay. Social visits and travel for recreation provide other reasons for visiting Montego Bay. Farmers in the Bethel Town and Seaford Town

communities of Westmoreland rarely visit Sav-la-Mar. They frequently visit Montego Bay, a larger centre, since Sav-la-Mar and the St. James capital are almost equidistant from the two districts. However, Long Hill, which is about four miles from Montego Bay, has a skilful doctor who attracts patients from various parts of Westmoreland and the neighbouring parishes.

Kingston is visited most frequently on business by those farmers who own trucks or cars. A few "higglers"⁴ sell farm products and purchase other goods in this city. The majority of the farmers interviewed who visit Kingston make the journey in order to see relatives. Two are exceptional cases who go weekly on government business. These are members of the House of Representatives.

The service-centres (towns and villages) of Map 1 show the chief centres which provide services to the farmers interviewed. The distribution of these towns and villages is not emphasized because numerous small villages, which are unlisted for simplification, provide shopping facilities and residential functions for the inhabitants. Most districts have road junctions which are the nuclei of commercial and sometimes of recreational activities.

⁴ Pedlars who purchase farm products from farmers and resell the goods at the local markets or to housewives by visiting the homes are called higglers locally.

All towns and villages listed are multi-functional. The residential function is dominant but the cultural and commercial functions exist in varying degrees. Dwelling houses, schools, churches, and stores are the main structures satisfying the needs of residents in the villages.

It should be stated in summary that the service centres of Westmoreland provide the services required by the majority of the residents of the parish. Variations in the frequency of visits to them are related to proximity to the centres, the cost and time factor and the urgency or demand for visiting these centres. The largest centres visited are Sav-la-Mar, Montego Bay and Kingston. (See Table 4.) Spanish Town is of special importance to a few farmers who cultivate rice and transport it to the Agricultural Development Corporation. Business, social reasons and medical services are the chief reasons for visits. Recreation, especially the cinema, plays an insignificant role in the life of these farmers. They have neither the leisure nor the cash to spare.

3. HISTORY OF SETTLEMENT

Place names are evidence of the history of Spanish and English settlement in the parish. Although the permanent

TABLE 4

PROPORTION AND AVERAGE FREQUENCY OF VISITS⁵

TOWNSHIPS	NO. OF FARWERS WHO VISIT	PROPORTION OF 90 FARMERS WHO VISIT	NUMBER WHO VISIT LESS THAN ONCE YEARLY	AGGREGATE NUMBER OF VISITS	AVERAGE NUMBER OF VISITS	PERCENT AGE OF ALL VISITS
Sav-la-Mar	80	88.9%	10	3,675	45.9	81.7
Montego Bay	53	58.9%	37	067	9.2	10.9
Kingston	47	52.2%	43	335	7.1	7.4
5 B 0						

Each number of visits to a town was treated as the visits of one farmer. For example, the visits of a farmer to Sav-la-Mar and to Montego Bay (20 and 30 in each case) would be treated as the farmer's visits. That is, the visit of one farmer to Montego Bay and those of the farmer to Sav-la-Mar.

effects of European settlement are widely disseminated throughout the island, Amerindians were the first to utilize the land in some parts of Jamaica. The Arawaks, a gentle, peace-loving, agricultural people, planted cassava, corn, sweet potatoes and cotton. Yet only traces of their primitive tools and utensils in the museum remind the curious visitor of their former existence. Enslavement and exposure to European diseases to which they had not developed an immunity resulted in their extinction within about fifty years of the Spanish occupation.⁶ Their population is believed to have been about 60,000 at the beginning of settlement by the Spaniards.⁷ The parish was visited by a few of the primitive inhabitants who settled on its plateau edges.⁸

Columbus's voyages to the New World are a matter of common knowledge. The island was settled fifteen years after his discovery of Jamaica on May 3, 1494. The Spaniards were slow to develop the island because it possessed none of the

⁸ P. Cundall, <u>Historic Jamaica</u> (London: Ballantyne Press, 1915), pp. 3-4.

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⁶ Llewellyn Gordon, "A Study of the Factors Which Have Determined the Present Stage of Economic Development in Jamaica," (M. A. thesis, The University of McGill: Geography Department, August 1955), p. 38.

⁷ The Gleaner Company, <u>The Gleaner Geography and</u> <u>History of Jamaica</u> (Kingston, Jamaica: United Printers Limited, 1965), p. 37.

minerals for which they were searching. Gold, their main prize, was not found in Jamaica in commercial amounts. Agriculture began at the stage in the history of the island by Europeans when Jamaica was used as a base from which other lands on the mainland were conquered and as a provision ground for troops.9

The Spanish settlement in Jamaica was never large nor flourishing. In 1655, when it was conquered by the English, it totalled only 1,500 inhabitants, including slaves.¹⁰

Although they were few in number, the Spaniards adopted and improved the crops of the Arawaks. The majority of the crops on which the economy of the island depends today were introduced by the Spaniards. They brought sugar cane, bananas, citrus fruits, rice, and Castillian vegetables to the island. Cattle, horses, hogs, asses and goats were introduced by them. Crops indigenous to the New World such as maize, sweet potatoes (<u>Ipomoea batatas</u>), cassowa or manioc, yama (<u>Didscorea</u>), and cacao were first cultivated in Jamaica by the Arawak Indians.11

9 Gordon, op. cit., p. 37.

10 <u>Five-year Independence</u> <u>Plan</u> <u>1963-1968</u>, (Kingston: The Government Printer, 1965), p. 2.

11 E. Long, <u>History of Jamaica</u> (London: Lowndes, 1774), Vol. 1, pp. 238-239.

The Arawak and Spanish settlements were coastal. Oristan (Bluefields) and Savanna-la-Mar were the chief Spanish settlements in Westmoreland. The Cabaritta River is another place name that reminds Westmorelanders of the Spanish occupation.

British settlement was more permanent and effective. For this reason, evidence was more readily available of British occupation and land use.

The discussion which follows explains settlement in Jamaica as a whole. However, many evidences of this pattern of initial settlement exist in Westmoreland. These are emphasized in this discussion.

British occupation of the western parishes, Westmoreland, Hanover and Saint James, began in the early eighteenth century as offshoots from the older settled areas. The ports of the newly settled areas became important centres of direct foreign trade within thirty years.¹²

The British occupation of the island lasted from 1655, when it was captured from the Spaniards, until the sixth of August, 1962, when the colony was granted independence. As a result of this prolonged control the country possesses indelible impressions of British economic and cultural influence. Its language is English and the island's

12 Gordon, op. cit., p. 54.

largest sugar estate, the West Indies Sugar Company, Frome, Limited, of Westmoreland is owned by Tate and Lyle, an English company.

The Spaniards' negro slaves were freed by the British at the time of conquest in 1655. This did not mean an end of slavery. Negroes were still imported from Africa and they were not emancipated until 1838.

The majority of the freed slaves became peasant farmers in the hills, not caring any longer, once freed to work on the sugar plantations.¹³

Their refusal to work on the plantations was due to the illtreatment which they associated with slavery and the exceedingly low wage the planters offered for their services. They took to subsistence farming in which they had experience from slavery. A new element was added, independence.

Emancipated negroes who remained on land owned by Europeans were charged exorbitant rents for the huts they

¹³ W.I.S. Co. in Jamaica: A Brief History of Sugar in Jamaica and the Contribution made by Tate and Lyle Limited to the Development of the Industry in the Last Twenty-five Years (London: The West Indies Sugar Company, Ltd., 1963), p. 5.

occupied and others were evicted by some planters.14

Those landless and evicted freemen, who were unwilling to work for their former masters, colonized the less accessible hilly and mountainous interior and squatted on properties possessed by absentee landlords. These negroes eked out their existence on subsistence farms which were remote from markets and roads. Their primitive shifting agricultural practices contributed to the destruction of the most valuable stands of timber and to the twentieth century erosion problem of the island.¹⁵ (See Appendix VI, No. 1.)

14 A. J. Newman, The Times Geography and History of Jamaica (4th edition revised, Kingston: Jamaica Times, Ltd., 1944), p. 105. "Exorbitant rents" is an allegation as used in this context. The newly emancipated negroes would naturally have found most costs for rental high since the majority lacked the capital. In addition, the Europeans were accustomed to rates which they probably introduced in the new environment with little or no modification. Such rents would be too high where, initially, capital was scarce and land plentiful.

15 Gordon, op. cit., p. 63. Those stands would have been valuable in soil and water conservation as well as for lumber if they were properly harvested. Consequently, the population as a whole lost some of its resources through improper utilization.

Place names of the period of negro colonization often describe events, specify townships settled by the church, or explain the marginal character of the land.

The endings "pen," "field," or "bull" usually denote lands that were formerly parts of estates. Some were the less arable sections whilst others were estates that could no longer pay their way. The word "pen" is especially prevalent on the dry plains of the south which had gradually reverted to cattle ranches (pens) during the eighteenth and nineteenth centuries.¹⁶

Rose Hall, King's Pen, Farm Pen, Bath Pen, Bull Head and Bethel Town are examples in Westmoreland. All of these except Bethel Town were formerly parts of Estates. (Appendix X.) They were cattle ranches. Farm Pen's primary economic activity today is dairying. King's Pen and Rose Hall have combinations of the descriptive and the marginal. Rose Hall was a dense rose apple (<u>Eugenia jambos</u>) forest adjoining the property of one Mrs. Ethel Hall and an extensive swamp of which it formed a part. The forests have been almost totally removed and a part of the swamp is used for rice production.

King's Pen is a large valley which was named after a former owner, one Mr. King. It was used primarily for cattle ranching because of its inaccessibility. Formerly, it was accessible only via bridle tracks on steep slopes over

16 Ibid., pp. 64-65.

mountainous terrain. Trucks can enter King's Pen today but the road is still very poor. It was one of the worst gravel roads of the parish on which the writer travelled in July, 1967. The property has been acquired and subdivided by the government for land settlement purposes.

East Indians were brought in as indentured servants to replace the emancipated people of African origin on the plantations. Subsequently, Chinese and Lebanese immigrated to the island as merchants. The impact of these later immigrants was to stimulate expansion of settlement.

Frequent unions between masters and slaves, and racial intermarriages of subsequent periods have produced Jamaicans who are ethnically classified as Afro-Europeans, Afro-Chinese and Afro-East Indians. The island is truly cosmopolitan and its people live together harmoniously. This harmonious living of its peoples of diverse racial origin is appropriately proclaimed on the Jamaican Coat of Arms, "Out of Many One People."

The history of settlement and land utilization in Westmoreland has been traced from the primitive Arawak Indians to the present day. No traces of Arawak settlement exist today in the parish but two coastal centres are proven to be of Spanish origin. The site of Sav-la-Mar was well chosen by the Spaniards. Their introduction of sugar cane

and livestock was a major contribution to the economy of the parish. Sugar cane and its by-products are the chief sources of income and employer of labour in the parish.

The largest and most fertile acreages in the parish are owned by a British company and private individuals of European or Afro-European ethnic origin. They had the advantage of prior occupation when land was free or when it cost very little. This advantage has been perpetuated for generations in individual families by hereditary land tenure.

It is apparent that on the hilly and less cultivable areas much of the land is occupied by peasant farmers. A number of exceptions exist where extensive cattle farms are located on the white limestones.

Seaford Town is a unique community. Its settlement on the shales and conglomerates dates back more than one hundred years. Some German migrants were settled there by Lord Seaford, an Englishman. This community of peasant farmers is fairly prosperous. It is a major banana-producing area of the parish.

Settlements in Westmoreland it appears, were influenced by the Age of Discovery, conflicts in Europe which stimulated the migration of the Germans to the parish, colonial rivalries, overseas expansion and slavery.

4. METHODOLOGY

In order to achieve the objectives described in the Abstract, a deductive approach has been adopted. A responsive sample is used to supplement information obtained from census data, theses, agricultural surveys, manuscripts, annual reports, published literature, and interviews with specialists.

A preliminary study was made of the physiographic map of Westmoreland, a soils map and recent annual reports of the Ministry of Agriculture and Lands Extension Services in the parish. The research problem was defined on the basis of the writer's previous knowledge of Westmoreland (his home for the most of twenty-seven consecutive years), and the additional information obtained from the maps and literature.

After a definition of the problem, a base map of the parish was drawn and subdivided into three hundred quarterinch square units (each representing approximately 1.1 square miles) with the objective of completing fifty per cent of them. It was known that a substantial proportion of the plains are owned and occupied by the West Indies Sugar Company, Frome, Limited. This and the presence of agglomerated villages necessitated some flexibility and subjectivity

of approach in order to provide a representative sample in the limited time available. Problem areas and major projects were given special emphasis. The West Indies Sugar Company was separately studied as an example of plantation agriculture.

A questionnaire (see Appendix I) was used as the primary basis of the rural survey of private farms. One hundred and four farmers were interviewed. Ninety typed questionnaires were completed because they were only used during the second visit to Westmoreland. Each questionnaire consists of only a fraction of the many questions which were asked during the process of this study. As discussions progressed and different aspects of farmers: activities were revealed, impromptu questions often elicited relevant answers about the nature of the farms and projects observed.

Some answers to the questions on the socio-economic aspects of this study were obtained by interviewing specialists in particular departments, agencies and associations. Brief and specific questionnaires were prepared prior to these visits. They were completed in the appropriate offices. Specific schedules were used at the offices of the Ministry of Agriculture and Lands Extension Services, the Jamaica Agricultural Society, the All-Island

Cane Farmers' Association, Westend Cane Farmers' Association, Rice Growers' Association, Agricultural Development Corporation, the Agricultural Marketing Corporation, People's Co-operative Banks, Dr. Barry Floyd, Head of the Sub-Department of Geography of the University of the West Indies, 4-H Clubs, Ministry of Agriculture and Lands, City Planning Department, commercial banks, Parish Council, Revenue Office, the Land Development and Utilization Commission, the Jamaica Public Service and Government Land Settlement officers.

These interviews were made within the parish, in Kingston, at Montego Bay, and in Spanish Town.

Three weeks were spent in Kingston interviewing, collecting annual reports, books and manuscripts, and making notes from manuscripts and annual reports. Summaries were made whenever copies were unavailable for distribution in ministries or statutory agencies.

The West Indies Sugar Company is sub-divided into departments and widely separated farms. Different Department Heads and specialists supplied answers relevant to their specialties. The farm, factory, survey (for land reclamation project), transport and communication, recreation, housing and marketing were the chief subdivisions investigated.
Information on livestock production on the West Indies Sugar Company farms was available at Prospect Park and at Cornwall, two Company farms in Westmoreland.

A week was spent studying the agriculture and production of this Company. Part of the time was spent making notes from annual reports and observing various aspects of the Company's operations. The remaining five weeks were spent processing data, compiling a land use map and interviewing farmers. Progress was often impeded because of heavy afternoon rains which prevented continuation of the field work.

A second visit was made to complete the field work and to make a more comprehensive study of Government Land Settlement Schemes, marketing, and the water supply of the parish. Fortunately, the period January 22 to February 11, 1968 coincided with the low rainfall period. Ninety farmers were interviewed during this period. The weather was excellent and the most important sections of the parish were observed by the writer.

A vegetation and a land utilization map were completed from the preliminary map of the City Planning Department in Kingston. The base map of land use in Westmoreland was made with the aid of 1961 aerial photographs. Portions of the parish were mapped on three separate sheets. A scheme

involving twenty-one different types of land use compiled by the International Geographical Union (I.G.U.) was modified and used in a study of land utilization in St. Catherine, Jamaica by Mr. W. G. Collins of Leeds University.17 The classifications he used were utilized to produce a base map. After further modifications and generalizations the maps were produced.

Crops are often mixed and the degree of usage varies greatly. Attempts to categorize grasslands, for example, into improved or unimproved pasture may give a false impression of accuracy since farmers may simply remove harmful weeds by cutting pasture annually, and portions of the same field may be cultivated and fertilized while other sections may be unimproved. "Pure Cropping"¹⁸ or a mixing of crops may be practised. For these reasons, grass is generally used without any subdivision and crops are combined where more than one characteristic predominates.

The following are the chief governmental departments, private agencies and statutory bodies whose functions and

¹⁸ Planting of one plant such as sugar cane or rice in a field, that is, without mixing the crops.

¹⁷ W. Gordon Collins, "Aerial Photography Applied to Tropical Land Use, "<u>Chartered Surveyor</u>," Vol. 99, No. 5 London: Royal Institution of Chartered Surveyors, November, 1966), p. 255.

effectiveness are studied and assessed at the parish level:

- 1. The Ministry of Agriculture and Lands Extension Services.
- 2. The West Indies Sugar Company, Frome, Limited.
- 3. The All-Island Jamaica Cane Farmers' Association.
- 4. The Jamaica Agricultural Society.
- 5. Credit Unions, People's Co-operative Banks and commercial banks as sources of credit.
- 6. The Agricultural Marketing Corporation.
- 7. The Negril Development Project.
- 8. The Agricultural Development Corporation.
- 9. The All-Jamaica Banana Growers' Association.
- 10. Citrus Growers' Association.
- 11. The Livestock Association.
- 12. 4-H Clubs.
- 13. Trade Unionism and labour.
- 14. Land settlement schemes, other government schemes and important projects.

An assessment is made of farmers' attitudes to these bodies and the extent to which they utilize the available facilities. Finally, suggestions are made for the improvement of agriculture in the parish.

5. DEFINITIONS

Whenever the phrases "the parish" and "this parish" are used in this paper, they mean Westmoreland.

A <u>farm</u> is defined as all the land occupied by one person or corporation for agricultural purposes within a single parish. It may be composed of any number of parcels within the given parish, and the parcels may be occupied on any terms (owned, rented or rent-free).¹⁹ Units less than an acre are not recognized as farms unless they contain a minimum of one square chain of cultivation.

<u>Plantation</u> is another term which is defined. Initially, a plantation was used to mean the cleared and cultivated portion of a wooded area which derived its income from staple products. Plantations were usually larger than farms.²⁰ The West Indies Sugar Company's estate in Westmoreland derives its income from a major cash crop from which sugar and its by-products are produced. The enterprise is essentially commercial agriculture with hired labour under management supplied by the factory. It is an

19 Department of Statistics, <u>Agricultural Statistics</u>, <u>1961-1962</u> (Kingston: Department of Statistics), 1966, p. 3. This definition omits leases as a form of occupancy. The lease is included for the purpose of this study as a method by which land is occupied.

²⁰ Ralph H. Brown, <u>Historical Geography of the United</u> <u>States (New York: Harcourt, Brace and Company, 1948), p. 131.</u>

example of plantation agriculture which is more comprehensively defined in Chapter IV.

<u>Peasant farming</u>, on the other hand, is characterized by small acreage, a limited use of machinery, an extensive utilization of tools, excessive application of fire, and a generally low level of sophistication of cultural practices on the farm. "There are about 159,000 farmers in Jamaica of whom 154,000 are in the category of under 25 acres."21 "The average acreage per farm in 1961 in the categories 0 to 4 acres and 5 to 24 acres were 1.8 and 9.6 acres respectively."²²

At the parish level, 9.6 per cent of all farms are under 5 acres. 18.6 per cent of the farms fell within the category of five to under twenty-five acres. The average acreage of the smaller and larger categories were 1.4 and 5.6 acres respectively. 63.9 per cent of the aggregate parcels of land in Westmoreland were categorized as farms under five acres. A total of 94.1 per cent of the farm units are less than 25 acres and only 28.2 per cent of the total acreage falls in this category. These statistics demonstrate that a significant proportion of the farms are too small to

21 <u>Five-Year Independence Plan 1963-1968</u>, p. 96.
22 <u>Ibid.</u>, p. 17.

assure the farmers of a reasonable standard of living. They also show the poor distribution of land in the parish. The majority of farmers have only a small proportion of the total acreage. (See Tables 1 and 2.) All references to "peasants," "Small farmers," and "peasant farming" are made to those whose farm units are smaller than twenty-five acres. Although some products are sold, peasant farming is basically subsistence agriculture.

"Medium farms" range from twenty-five to one hundred acres. All farms of a hundred acres and above are classified as "large farms." The last category is based primarily on investigations of the Land Development and Utilization Commission and on the writer's observations.

It is the policy of the Jamaica Government to investigate land use in the island. The Commission previously mentioned was established toward this end. It is concerned only with properties of one hundred acres and above, these being generally considered to be economically viable agricultural units.

Observation has revealed that these units are often more mechanized than the others. Agricultural practices tend to be more scientific on the larger units than on the smaller farms of Westmoreland.

Another word which must be clarified by this paper is

"locally." It is used to mean the district or neighboring districts where the farmer purchases supplies. These districts are generally within a mile of the farmer's homestead. In the majority of cases, supplies are obtained in the same district as that in which the farmer lives.

References to dollars and cents are made by using the Canadian dollar, as the unit of value. The current (1968) exchange rate is \$2.64 Canadian: H Jamaican. Calculations are made on that basis in this study except for other years. In the latter example the average exchange value of the British pound is calculated in Canadian dollars for each year to which reference is made.

"Ruinate" refers to cultivable land which was covered with weeds during the observation period. It may consist of low trees but not dense woodland. Land which is covered with weeds on areas which are over fifty per cent rocky, in steep slopes or forested, are classified as "other" or as "woodland."²³

"Food forest" exists when there is a tall canopy of economic trees such as breadfruit (<u>Ortocarpus incisa</u>), star apples (<u>Chrysophyllum cainito</u>), guinep (<u>Melicocca bijuga</u>),

23 Department of Statistics, op. cit., p. 11.

and coconut (<u>Cocos nucifera</u>). These may be with or without a lower canopy of cocoa (<u>Theobroma cacoa</u>), coffee (<u>Coffea</u> <u>arabica</u>) and citrus (Citrus spp.).²⁴

Small holdings on which mixed cropping predominates and which are gardens in some cases are classified as horticulture. They are frequently hill farms and are usually associated with tree crops.

<u>Cultural</u>, as used in Chapter VII, means the factors contributing to mental and physical development by training; particularly training of the farming population and employees of industries connected with agriculture in Westmoreland. Some of this training is received directly via the agricultural educational institutions and social agencies and indirectly by communicating with trained persons in agriculture, banking, trade unionism and marketing which are of special interest to farmers. Culture is used in a general sense to include the major forces which contribute to human development. The socio-economic factors influencing agriculture are interrelated with the cultural. Consequently, they are inseparable and at times indistinguishable.

24 Ibid., p. 10.

TABLE 1

ACREAGE AND PROPORTION OF LAND IN WESTMORELAND BY SIZE GROUPS²⁵

PARISH TSI AND			SIZE GROUPS			
AND I TEMS	0 to under 5 acres	5 acres to under 25 acres	25 to under 100 acres	100 acres to under 500 acres	500 acres and over	Total acreage
WESTMORELAND	14,480	28 ₉ 143	13,834	19,900	75,186	151,543
ACREAGE IN CATE- GORY AS PERCEN- TAGE OF TOTAL ACRES IN WESTMORELAND	9.6	18.6	9.1	13.1	49.6	100
JAMATCA	198,000	389,441	167,607	185,596	770,786	1,711,430
WEST. AS PERCEN- TAGE OF JAMAICA'S TOTAL BY CATEGORY	7.3	7.2	8.3	10.7	9.8	8.9
WEST. AS PERCEN- TAGE OF JAMAICA'S TOTAL ACREAGE	ზ0 •	1.7	то •	1.2	4.4	8.9
25 Departmer (All pe the wr agricu	nt of Statisti ercentages and riter on the l ultural censu	ics, <u>Agricult</u> averages ir basis of the s.)	ural Statist 1 Tables 1 and statistics s	ics 1961-196 1 2 were cal upplied by	22, p. 113. culated by this	

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TABLE 2

TOTAL ACREAGE, NUMBER OF PARCELS, PROPORTION OF PARCELS AND AVERAGE

	ARÉA OF PARCI	ELS BY SIZE GROUP IN	I WESTMORELAND ²⁶	Ę
SIZE GROUPS	TOTAL ACREAGE	NUMBER OF PARCELS	PERCENTAGE OF PARCELS	AVERAGE SI ZE
Farms O to Under 5 acres	14 ₆ 480	10°549	63.9	OF FARCELS 1.4 acres
Farms 5 to Under 25 acres	28,143	5 , 019	30.5	5.6 acres
Farms 25 to Under 100 acres	13,834	740	4.5	l8.7 acres
Farms 100 acres to under 500 acres	19,900	115	۲.	173 acres
Farms 500 acres and Over	75,186	73	4.	103 acres
Total Farms in Westmoreland	151, <u>5</u> 43	16,496	100	9.2 acres
26 Ibid., pp.	. 95–99.			

CHAPTER II

POPULATION

The content of the following discussion includes: the age and sex structure, ethnic groups, density, distribution, marital status, education characteristics, mobility, attitudes and the growth trend of the population of Westmoreland. An explanation is given of the salient trend and population problems of Jamaica as a whole.

1. DENSITY, DISTRIBUTION AND ETHNIC CHARACTERISTICS

The 1960 census shows the population of Westmoreland as 109,606, a density of over 340 per square mile.¹ These people are widely distributed throughout the parish with major nucleations at Savanna-la-Mar, Grange Hill, Little London, Darliston, Bethel Town, Petersfield, Negril and Seaford Town. Savanna-la-Mar, the largest centre, has a population of about 10,000.² The population is distributed from Savanna-la-Mar in a linear pattern along the main roads leading to the other major centres of population within a

¹ Stark, <u>op</u>. <u>cit</u>., p. 10.

² Gleaner Geography, <u>op</u>. <u>cit</u>., p. 22.



ten-mile radius. (Relate Map 1 and Appendix X to Map 2.) This linear distribution is also visible along the west and south-west coasts. (See Negril on Map 1 and population distribution on Map 2.) Swamplands at the Great Morass and near Savanna-la-Mar as well as the dense tropical forest region are virtually unsettled. (Maps 2 and 6 and Appendix X.)

In 1954, G. E. Cumper wrote about Westmoreland:

... the population of the canelands is increasing faster than the rest of the parish. This reflects a considerable local migration from the peasant areas of the parish into the canelands.³

Until the 1930's, movement was toward the hilly areas. The reverse trend toward the fertile alluvial plains has been due to an increased prosperity of the sugar industry since 1938 and the failure of the inefficiently cultivated uplands to absorb further increases in the population.⁴

Certain limitations prevent a quantification of the distribution of the population on a mountain-lowland basis. The 1943 and 1960 censuses of Jamaica were taken during the sugar cane harvest when the population was concentrated on

3 G. E. Cumper, "A Modern Jamaican Sugar Estate," Social and Economic Studies (Kingston, Jamaica: United Printers Ltd., 1954), Vol. 3, No. 2, p. 121.

⁴ Alan Eyre, <u>Land and Population in the Sugar Belt of</u> <u>Jamaica</u> (University of the West Indies: Department of Geography <u>An.d.7</u>, pp. 1 and 2. See "Peasant Farming" for the reasons for the inefficient cultivation of the uplands. the plains. Another problem is that the parish is the basic census unit and differences in the population of lowland and hilly areas are concealed within this grid.

A third limitation is that intra-parish census divisions are subjected to changes without relating them to past censuses. This makes the correlation of intra-parish data from different censuses a complex and laborious procedure.⁵

An incidental reference was previously made to the cosmopolitan nature of the population of Jamaica in "History of Settlement." Westmoreland is no exception. People of "pure" African origin constitute 76.8 per cent of the population. Afro-Europeans are next in number with 14.2 per cent.⁶ East Indians are third in numerical importance. They constitute approximately 5 per cent of the total. Other races--Europeans, Syrians and Chinese--constitute a small proportion. The male and female constituents are almost in the same ratio as the ethnic groups. (See Table 5.)

2. AGE AND SEX STRUCTURE

The age and sex structure of the parish population

5 <u>Ibid</u>., p. 2.

⁶ O. C. Francis, <u>The People of Modern Jamaica</u> Kingston, Jamaica: Department of Statistics, 1960), Table 4-3.

reflects their fertility, mortality and migration experience.7 There was some modification in the proportionate importance of the youngest and oldest age groups of the parish during the inter-censal period, 1943 to 1960.⁸ The youngest group increased by approximately four per cent (4.2%) and the oldest experienced a decline of three-tenths of one per cent. A trend exists in the island toward an increase in the proportion of both groups of those under fifteen years of age, with the greatest increase in the under 15 age group because of the high and rising birth rate.¹⁰

An established sex ratio shows that the number of females is significantly larger than the number of males in the parish and in the island. In 1943, for every 964 males there were 1000 females in Westmoreland. By 1960 the male population had declined to 959 per 1000 females. There was a large decrease in the male to female ratio of the 15 - 44 year age group over the same period. The number dropped from 974 males per 1000 females to 894. A similar tendency existed in the total population of the island. Here, the

7 G. E. Cumper, <u>Preliminary Analysis of Population</u> <u>Growth and Social Characteristics in Jamaica, 1943-60</u> (Kingston, Jamaica: Institute of Social and Economic Research, $/\overline{n.d.7}$, p. 409.

- ⁸ <u>Ibid</u>., p. 408, Table 17.
- 10 <u>Ibid</u>., p. 398

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TABLE 5

PERCENTAGE DISTRIBUTION OF POPULATION BY RACIAL ORIGIN AND SEX FOR WESTMORELAND9

PARISH OF WESTMORE- LAND	AFRICAN	EAST INDIAN	CHINESE	EUROPEAN	AFRO- EUROPEAN	AFRO- EAST INDIAN	AFRO- CHINESE	OTHER	ALL RACES
Parish Total	76.8	4.8	0.2	۲.	14.2	2.2	0.2	0.9	100
Male	0°22	4.9	0.3	2.	13.9	2.1	0.2	0.9	100
Female	76.7	4.7	0.2	.6	14.5	2.2	0.2	6.0	100
9 <u>1</u> 6	<u>id., (Ext</u>	racted f	rom Table	4-3.).					

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decline was from 937 to 925 males per thousand females.ll

Approximately thirty-eight per cent (38.2%) of the population of Westmoreland are of age fifteen to forty-four years. This is lower than the national proportion, which is 40.1 per cent.¹² The large proportion of the population in this age group seems to justify Cumper's emphasis on the group.

3. MARITAL STATUS AND FERTILITY RATIO

The legally married males of Westmoreland are expressed as a percentage of the number of private households in the parish. These statistics deal with married males who are fifteen years of age or over. In 1943, the proportion was 35.3 per cent. This rose to 36.6 per cent in 1960.13 Both figures are slightly above the national average of 32.1 and 34.3 per cent in 1943 and 1960 respectively.

In an interview of 98 farm households, 68 per cent contained married farmers. Eighty-six per cent of these

- 12 <u>Ibid</u>., p. 424, Table B6.
- 13 <u>Ibid</u>., p. 409, Table 18.

^{11 &}lt;u>Ibid</u>., p. 408, Table 16. (The major source material, O.C. Francis' <u>The People of Modern Jamaica</u>, ceases to be re-printed for publication. Limited time and the phenomenal cost of Xeroxing copies in Jamaica prohibited a maximum use of this source. Hence, a secondary source material which is less comprehensive had to be utilized.)

farmers were males. The mean age of the farmers was fortysix years.14

The crude birth rate is an unsatisfactory measure of human fertility since no allowance is made for differences in the proportion of persons of child-bearing age in various populations at different age groups. This difficulty can be partly overcome by the use of the fertility ratio or the ratio of children under the age of five to women aged 15 to 44.¹⁵ There is a general increase in fertility in the island. The fertility ratio rose in Westmoreland from 62.2 per cent in 1943 to 88.4 per cent in 1960. This is well above the national average of 51.5 and 77.0 per cent¹⁶ during the corresponding periods but is similar to the increases in most parishes.

Westmoreland had a crude birth rate of 33.7 births per thousand in 1943 and 40.5 in 1958. This compares fawourably with 31.5 and 41.0 per thousand at the national level for the respective periods. The death rates fell from 14.7 persons to 11.4 per thousand between 1943 and 1958. These figures were higher than the death rates per thousand of the nation which decreased in the fifteen years from 14.1

14 Obtained from interview by the writer.
15 Cumper, <u>Preliminary Analysis</u>...., p. 401.
16 <u>Ibid</u>., p. 402, Table 9.

to 9.6 persons per thousand.17

4. EDUCATIONAL ATTAINMENT

This subsection discusses the academic, technical and vocational characteristics of education in the parish with special emphasis on that of the farmer.

The technical and educational attainment of the Jamaican farmer is generally very low. It is lowest among the peasant farmers who are the majority of the cultivators in the country.

The low educational level of the majority of farmers is a major factor responsible for poor standards of husbandry, and the bulk of the farmers lack the capacity to benefit fully from the training provided by the government extension services. Besides, the educational system has never been sufficiently closely identified with socio-economic development. The bias has always been towards a classical type of education modelled on the British system and with no particular relationship to the agricultural nature of the island's rural economy.¹⁸

An examination of the educational characteristics of the male population of fifteen years and over in the parish will give some concrete indication of the educational attainments of the farmers. The census data is used for males

17 Ibid., Table 10.

18 Central Planning Unit, op. cit., p. 96.

fifteen years and older because the fifteenth year is the elementary school-leaving age in Jamaica. This is the age when universal education, free of charge ends in the island. This is the termination of formal education for the great majority of the population. Males are also selected for another reason. They form the great majority of farmers of the country. Appendices II and III give a comprehensive summary of the educational characteristics of the male and female population from fifteen-plus to over ninety years in the parish. What follows is an interpretation of the major aspects of these statistics.

There were fifty-eight males and twenty-one females with university degrees in Westmoreland in 1960. They were, for the most part, professionals such as lawyers, doctors, teachers and engineers. Only a very small fraction of this number who work in supervisory capacities at the West Indies Sugar Company are directly concerned with agriculture as their main source of income. A few cultivate their own properties as part-time farmers.

Of the 29,461 males listed for the parish by the census, 27.8 per cent (8,180) were illiterates. The majority (68.2 per cent or 20,179 men) received only a haphazard elementary education of two to eight years which was punctuated

by frequent absences.¹⁹ Peasant farmers are primarily from those with an elementary education and from the group without any formal education. The sample made by the writer revealed an average education of Grade Five among the farmers of the parish.

Holders of the Third Jamaica Local Examination Certificate (Grade Ten), School Certificate (Grade Eleven), and Higher School Certificate (Grade Twelve) and other certificates generally gain entry to the professional colleges for further training to become teachers, nurses, agricultural officers, stenographers and commercial secretaries. A few are entering the University of the West Indies.

Others who pass the Second Year Jamaica Local Examination (Grade Nine equivalent), unsuccessful Third Year students and high school trainees who fail to obtain a certificate are often engaged in clerical and sales employment for private enterprises. These unskilled persons rarely seek employment on farms or consider farming as a vocation. Indeed, the great majority of these people would be offended if they were offered farming as their means of livelihood.

¹⁹ Education is non-compulsory at all levels in Jamaica. It is free only at the elementary level. A recent innovation is the extension of education in Junior High Schools, free of charge.

Because of this and an education system which needs to be modified to satisfy the needs of the community, the average level of education among farmers is exceedingly low.

5. ATTITUDE TO MANUAL WORK

There is a marked tendency for manual and menial tasks to be viewed disdainfully in Jamaica. Most of the youths of the land want white collar jobs although they are improperly qualified to hold these positions. A shortage of trained personnel exists in the trades and there is a scarcity of qualified farmers. Farm hands are exceedingly scarce, yet there are many young men who are without certificates and are unskilled and unemployed. These ablebodied men could probably be successful farmers or skilled tradesmen. However, they prefer to migrate from country to towns and cities in search of positions partly because of the stigma attached to manual work, the low subsistence level of the farmer, the limited technology on Jamaican farms, and the historic attraction of "white collar" jobs.

Historically, slavery bequeathed certain ills which have not been totally overcome. During the slave era the property owners and overseers were white men who received all the honour and respect. A negro who became a leader of a work gang was a few tiers above enslaved followers on the socio-economic ladder. He and their masters were at the same time respected, envied and feared. Their positions were the objects of all aspirations.

This high esteem for positions of authority was perpetuated by Jamaica's colonial masters during many decades after emancipation. Europeans and Afro-Europeans occupied the most remunerative and authoritative positions. They owned the most fertile land. Wages paid to their uneducated and unskilled employees were at a subsistence level.

As time elapsed, educated negroes penetrated the upper echelons of the society. These newcomers were no longer engaged in manual work. Their offspring and friends who emulated them began to emphasize the professions as the passport to progress. This attitude, though modified and changing, has continued through the generations.

The minimum wage rate for farm labour is still low and the low level of technology causes the farmer to rely too much on brawn and only to a limited degree on skills. These economic and technological factors, and the small farm units which prevent most peasant farmers from maintaining desired standards of living are the major reasons for the avoidance of farming by the young men.

Attitudes to the trades are slightly different. Some trainees are unwilling to endure the five-year apprenticeship period because salaries are low and there is little independence. High school educants without certificates regard it as socially unacceptable for them to learn manual skills. A high school graduate in Jamaica would be the exception if he considered a trade. Among the youthful population only graduates of trade schools and the Kingston Technical High School are likely to accept practical training with a positive attitude.

The current minimum wage rates for unskilled labour are \$1.98 (15 /-) per day for men and \$1.64 (12/6d.) per day for women.²⁰ A weekly income of about ten Canadian dollars is inadequate to provide the minimum requirements of the average Jamaican family.²¹ The seasonal characteristics of the employment that is available to these workers aggravate the plight of the farmer and the unskilled and some skilled employees who are "laid off" at the end of the sugar cane harvest.

It is true that the advent of the bauxite companies

20 Interview. L. G. Bahado, Organizer, National Workers Union, Western Area, August 11, 1967.

²¹ It appears as if no minimum income has been established for the average Jamaican family but it is believed that a net farm income of &8 to &9 (\$21.12 - \$23.76: Canadian) plus some subsistence crops would be satisfactory. <u>Five Year Independence Plan 1963-1968</u>, p. 116. There are no welfare programmes in Jamaica.

and the growth of the tourist industry are changing the socioeconomic status of tradesmen and farmers. Higher wages are paid by the bauxite companies for skilled and unskilled labour. An increased demand and higher prices in the tourist industry tend to raise the standard of living of some farmers. A rising cost of living and the low level of mechanization on farms tend to offset these advantages and make farming an unattractive means of livelihood.

Many peasant farmers till and weed with the traditional farm tools; the fork, hoe and machete. A spade and a fork are still the chief farm implements among small farmers for preparing drainage ditches. Eighty-four of ninety farmers interviewed reported that they weed their fields manually. Manual tillage was practised by 58 of the same group. Sixtyfive owned only the farm tools listed on their farms. Farm machinery was more satisfactorily distributed on the medium and large farms. Fourteen of the farmers interviewed possessed wheeled and crawler tractors.

It is not surprising that the young men migrate to Kingston and Montego Bay in search of an easier life once they possess the minimum amount of education. They are unwilling to expend a great amount of physical energy on very small farms on which it is barely possible to make a subsistence income. The human resources are available in the

parish but the levels of education and technology need improvement. Quantity and quality must combine in the population of Westmoreland to utilize the natural resources economically and effectively.

6. MOBILITY

The mobility pattern of the population of Westmoreland is characterized by three movements. One is intraparochial, the second is emigration overseas, and the third is immigration from foreign countries.

Migrants are chiefly young people. Migration tends to modify the population structure of each parish because of net gain or loss among parishes or to foreign countries.²² Westmoreland experienced a net internal migration loss of 7,000 people during the intercensal period 1943 to 1960 and an estimated overseas migration loss of 13,500 during the same period. This represented a net overseas migration of 13.6 per cent which was slightly higher than the national average of 12.43 per cent.²³

The evidence of internal migration had to be establish-

22 Cumper, Preliminary Analysis ..., p. 405.

²³ <u>Ibid.</u>, p. 406, Table 14. (The net overseas migration is expressed as a percentage of the mean population 1943-60).

ed indirectly by an examination of the relation between the parish of birth and the parish of residence of the population at the census date because there is no direct record of internal migration in Jamaica.²⁴ It was established, on this basis, that the population born and resident in Westmoreland was 90, 87 and 89 per cent in 1943, 1953 and 1960 respectively, of the resident population of the parish on those dates. This is well above the national percentage of 81, 80 and 77 per cent in the respective periods.²⁵ However. the high ascertained percentage of the population which was born and resident in the parish is similar to that of the majority of parishes. Permanent inter-parish migration does not seem to be very high except to Kingston and to Montego Bay. Some migrants from Westmoreland settle permanently in both urban centres. A length of stay of six months was used to denote permanent residence for census purposes.26

Overseas migration was the most important mobility factor in the period under survey. Britain was the chief recipient of emigrants from Jamaica. The effect of emigration on the island

24 <u>Ibid</u>., p. 403.
25 <u>Ibid</u>., p. 403, Table 11.
26 <u>Ibid</u>., p. 407.

...was to reduce the total population by an amount greater than the migration itself by lowering the crude birth rate which would have obtained in its absence.²⁷

Other effects were a relatively unimportant loss of skilled $labour^{28}$ and a rise in the ratio of the non-productive to the productive population.²⁹

Two unquantified additions may be made to the above observations of Gene Tidrick. It is believed that the migration of unskilled and semi-skilled males to the United Kingdom is one of the contributory factors to labour shortage on the farms of Westmoreland. One may argue convincingly that because of the poor attitude to manual work among the young adult males who formed the majority of male migrants, their presence in the parish would not have ameliorated the farm labour shortage substantially. Yet, their absence and its possible effect on the aggravation of the problem cannot be ignored.

28 Ibid., p. 35.

²⁹ <u>Ibid.</u>, p. 28. See "Labour shortage." It is shown in this subsection that the labour shortage may be exaggerated. The problem is partly a lack of communication between employer and potential employee and unwillingness on the part of the latter to work as farm hands.

²⁷ Gene Tidrick, "Some Aspects of Jamaican Emigration to the United Kingdom 1953 - 1962." <u>Social and Economic</u> <u>Studies</u> (Kingston, Jamaica: University of the West Indies, Vol. 15, No. 1, March, 1966), p. 28.

A change in the immigration policies of Britain in the 1960's is a factor which has already reduced emigration. Formerly, Commonwealth emigrants could migrate freely to the United Kingdom. At present West Indians, Pakistanis, Africans and Indians have to obtain work permits to enter Britain and a fixed annual quota is established for some countries.

This new policy has been effective in stimulating a drastic reduction of Jamaican emigrants to this main outlet. It will, undoubtedly, cause a measurable change in emigration from all parishes.

The United States and Canada have opened their doors a little wider than formerly to Jamaican emigrants but their emphases are on quality rather than quantity. Skilled and professional people are given priority. Although this will partially offset the impact of the drastic British reduction, the area which needs the assistance most, the semi-skilled and unskilled, will be almost unaffected. A further explanation of the American and Canadian attraction to emigrants is outside the scope of this paper, which attempts to explain the mobility of the population of Westmoreland primarily.

The immigration of foreigners to Westmoreland is a minor feature of population movement. A few properties have

been purchased by Americans who move between the parish and the American mainland frequently. Summer cottages in the tourist resort area of Negril are providing the potential for a future increase in this practice. The rare Englishman who joins the staff at the Frome sugar factory often makes Jamaica his permanent residence.

It is evident from this discussion that migration is greatest within the parishes and overseas. Most residents were born in the parish. Mobility is not as high as one might suppose. It has adverse effects on the labour shortage but is advantageous in reducing the total population growth and the population pressure on the land. Some skilled labour might be lost in the process. The amount of skilled labour lost through emigration is relatively unimportant because of the small proportion and the increased <u>per capita</u> income which is often experienced by the migrant who sends some of the money to relatives and dependents in Westmoreland.

7. POPULATION TREND

Demographers admit that they do not have all the answers relating to the future growth or decline of any population. Many factors may cause modifications of the fertility and mortality rates of a population. These changes

may be gradual or catastrophic. They may be the result of changes in the age, sex structure, epidemic diseases, wars, discoveries in medicine that tend to increase longevity, or simply improvement in diet, education and sanitation. Therefore, a prediction of population trend assumes that there will be no drastic changes in the death rate, birth rate, fertility ratio or population structure under investigation. This is a premise which is made on the basis of the present and past characteristics of the population. It is acceptable since demographers and geographers do not possess any prophetic powers. Allowances are made for changes in the prediction which follows but these changes are presumed to follow the existing population pattern.

Overseas emigration will tend to decline from Westmoreland and the other parishes because of the partially closed British outlet and the selective immigration policies of Canada and the United States.

The population of the parish will continue to increase. It increased by 20.70 per cent during the intercensal period (1943 to 1960) and there is no evident reason to suggest a discontinuance of this trend. A reliable government estimate suggests that the population increase is fairly rapid. Jamaica's population increased by

2.6 per cent in 1966.³⁰

8. THE POPULATION PROBLEM

As a result of a rapidly increasing population, the pressure of the population on the land will increase.

By the end of 1962 the island had a population density of 377 per square mile, higher than that of India. More significantly, Jamaica has a density of 1050 persons per square mile of agricultural land, and nearly twice that figure per square mile of agricultural land excluding permanent grassland.³¹

About one-fourth of Westmoreland, for example, is plains.³² It was previously established that the trend is toward migration from the hills to the plains because of soil exhaustion, low fertility, stoniness and erosion of the mountainous areas. When this trend is added to a rising population and the reduced emigration, it becomes evident that there will be an acceleration in the competition for the use of the land on the alluvial plains.

Associated with the increasing population are unemployment, the problem of providing schools, education,

30 Central Planning Unit, <u>Economic Survey Jamaica</u> <u>1966</u> (Kingston, Jamaica: The Government Printer, May 1967), p. 39.

31 Gene Tidrick, <u>op</u>. <u>cit</u>., Vol. 15, No. 1, p. 25.
32 The Gleaner Geography, <u>op</u>. <u>cit</u>., p. 22.

adequate water supply and other social amenities which will be discussed in appropriate subsections.

The government of Jamaica is currently attempting a birth control programme as a possible solution to the population problem. It is forced to proceed cautiously because the church is opposed to this measure and the public has to be educated to accept this solution. Prohibitive costs are other obstacles to the extensive implementation of the programme.

9. SUMMARY OF POPULATION STATISTICS

This parish, like the island, has a high population density. The density is highest on the agricultural land because approximately three-quarters of the parish are mountainous.

Westmorelanders are primarily of African and Afro-European ethnic origin. There are more females than males in the population. Farming is practised chiefly by men. Their average age is between forty and fifty years. The majority of those interviewed were married. The marital status of the majority is not surprising since they are the older men of the community.

Generally, their level of education is low and their

knowledge of scientific farming is very limited.

The medium and large property owners have a higher educational attainment. A few of them had college training in agriculture.

The average Westmorelander has a poor attitude to manual and menial tasks. This is partly the result of the historical influence of slavery but primarily because of the low remuneration associated with these jobs and the very low socio-economic status of such employees. These stigmas and attitudes are changing but they change very slowly.

Mobility of the population exists among the parishes and to foreign countries. Young adults migrate more frequently than do older members of the community. However, the great majority of the population is stable. Most residents reside permanently in the parish of their birth.

The trend is toward greater conglomerations of the population on the plains. As the population increases, the competition for the alternative uses of the land for settlement, industry and agriculture will increase. Overpopulation and many of its socio-economic ills are serious problems.

An attempt is being made to solve these problems but the opposition of the church, the low level of education

of that sector of the population which needs the assistance most, and the high costs will prohibit the effective use of birth control for future decades.

CHAPTER III

PHYSICAL RESOURCES

Westmoreland is endowed with diversified physical characteristics. It is the aim of this chapter to define these resources and correlate them with the agriculture of the parish. The main physical resources which will be discussed are the climate (rainfall, temperature and wind), the physiography, vegetation, soils and water supply. These combined physiographic and climatic factors influence agricultural land utilization in the parish.

1. CLIMATE

The parish has fairly uniform climatic conditions except for the inland hills on which the rainfall is greater than on the plains.

A. Rainfall

Table 6 consists of rainfall averages for Westmoreland which were calculated from recordings by the Jamaica Meteorological Office over a ninety-year period. It shows
TABLE 6

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WESTMORELAND AVERAGE RAINFALL 1870-1961¹

STATIONS	JAN.	FEB.	MAR.	APR.	МАҮ	JUNE	JULY	AUG.	SEPT.	ocr.	.vov.	DEC.	TOTAL
Bluefields	2.88	3.42	5.72	7.84	11.35	9.10	9.41	11.08	10.10	10.95	6.25	2.68	91.08
Darliston	3.09	4.06	5.87	11.16	18.05	11.32	11.86	15 • 50	14.48	15.53	7.49	3.17	121.58
Frome	1. 85	2.16	3.51	7.23	12.45	9.24	6.99	9.69	9**6	9.77	5.38	2.48	80.21
Grange Hall	2.89	2.96	4.61	7.87	13.26	JL.IL	11.19	11.91	11.87	11.73	5.49	2.88	67.77
Little London	2 . 05	2.65	3.88	6.23	10.59	8,98	8.02	7.83	9.01	11.12	4.48	2.31	77.15
Negril Pt. Light House	2. 03	2.59	2.72	3.46	6.61	5.56	5.66	6.24	7.44	7.91	3.64	2.04	55.90
Savanna- la-Mar	6. 96	2.08	3.03	4.77	3.16	6.45	6.21	1.4.7	7.19	8.64	3.59	2.03	61.52
Seaforth Town	0.33	2.80	10.18	16.98	15 • 5 5	7.84	14.48	17.67	9.48	16 . 25	5.50	2.08	41.9LL

the chief rainfall characteristics of major centres in the parish.

An average rainfall map of Jamaica divides Westmoreland into two general rainfall zones. The southern costal plains average 50 to 75 inches and the hilly interior 75 to 100 inches annually.² There are two precipitation maxima, May to June and August to November. In May and June, high convective activity is the chief cause of rainfall. Insolation is greatest in Jamaica during the northern summer, consequently there is the tendency for evaporation and condensation to increase. Because of the low pressure produced over the land by intense heating, the prevailing winds and seasonal easterly winds converge on the island. This results in some orographic rainfall on the windward slopes of the mountains. Rain fell on the mountains of Westmoreland on many days during June, July and August, 1967, when none fell on the neighbouring plains. However, convectional rainfall is the most prevalent form of precipitation in the parish.

The August to November maximum is due to convective activity, the passage of active easterly waves and a general

² Scientific Research Council, <u>The Rainfall of</u> Jamaica (Kingston: The Scientific Research Council, 1963), P. 5.

increase in the humidity of the atmosphere in the Caribbean area.³ This increased moisture content may be related to the shift in the pressure system and the resultant convergence over the land of maritime tropical air mass already mentioned.

December to March is the low rainfall period when modified cold air from the higher latitudes periodically influence the climate of Jamaica. Convective precipitation is reduced to its minimum and easterly waves are almost non-existent during winter in the northern hemisphere. Consequently, there is little rainfall from December to March. July is a transition period when the rainfall decreases slightly before the advent of the August to November rains.

Most of Westmoreland receives adequate rainfall for agriculture but annual and cyclical variations in distribution and amount are substantial and can cause serious problems. Droughts may be prolonged or severe, with resultant low productivity and hardship. This was the case in the first half of 1965 when the island experienced its most devastating drought in the modern history of Jamaica.⁴ Local production of root crops, sugar cane and livestock were adversely

³ <u>Ibid</u>., pp. 3 - 4.

⁴ The All-Island Cane Farmers' Association, <u>Twenty-</u> <u>Sixth Annual Report 1967</u> (Kingston: The Herald Limited, Printer), p. 3.

affected.⁵ Some livestock died as a result, despite emergency feed supplied by the government.

Excessive rains associated with hurricanes or those resulting in flash floods are sometimes disastrous. Flooding in the Great Morass is an annual phenomenon. This is the major area of the parish where flooding prevails as a menace. It will be solved when the current land reclamation project is completed.

B. <u>Temperature</u>

Tables 7 and 8 give some indication of the temperatures experienced on the coast and inland on the central plains. Generally, over 70° F. mean monthly temperature is necessary for the growth of tropical crops.7 The mean monthly temperatures of Westmoreland are generally above the 70° F. limit during the cultivation periods (March to about October) for most crops. Consequently, temperature conditions are suitable for tropical crop production. Temperature, in general, is closely affected by relief. However, in Westmoreland, because elevations range from just over 2,000 feet on the

⁵ The Central Planning Unit, <u>Economic Survey Jamaica</u> <u>1965</u> (Kingston: The Government Printer, April, 1966), p. 44.

⁷ The Economist Intelligence Unit and Cartographic Department of the Clarendon Press, <u>The Shorter Oxford Economic</u> <u>Atlas of the World</u>, 2nd ed. (London: Oxford University Press), 1959, "Introductory Section."

87.3 67.8 Dec. Dec. 85.9 70.1 82 54 88.0 68.5 87.5 71.8 Nov. Nov. \$T 65 87.9 89.9 73.3 Oct. 73.5 Oct. Taken from typed manuscript submitted by the Meteorological Office, Palisadoes, Jamaica. **\$**2 69 TEMPERATURES 1940-1961 Sept. Sept. 90.5 7.07 87.8 73.9 78°23 °W. \$2 69 90.5 70.3 89.1 73.3 Aug. Aug. MEAN MAXIMUM AND MEAN MINIMUM TEMPERATURES, FROME 1963-19666 85 68 Latitude 18°15'N. 90.3 6.69 88.7 73.2 July July 8 68 87.7 88.9 70.07 73.3 June June TABLE 7 00 NEGRIL POINT LIGHT HOUSE: **1**8 69 TABLE 88**.**3 88.5 72.3 May May \$ 68 83 Altitude 33 ft. 86.0 66.8 71.3 86.5 Apr. Apr. 8 65 Mar. 85.5 65.5 69.5 Mar. 85.5 64 0 81 62.7 85.7 68.5 Feb. 84.7 Feb. 83 83 63 86.0 64.7 68.5 Jan. 84.9 Jan. 8 61 Mean Max. Temp. Mean Min. Temp. Н. 7:00 а.m. 3:00 p.m. 0 44 о Ш Kind of Data Mean Max. Mean Min. 0 ц å å l

White Limestone Plateau to below sea level, there is little relief and its effect on temperature changes is of minor importance in agriculture. The temperature is often high for most months of the year; consequently, if precipitation, edaphic and technological requirements are suitable, tropical crops and livestock will thrive under the prevailing temperatures.

C. <u>Humidity</u>

High absolute and relative humidities are characteristic of the parish, as is the case over most of Jamaica. (See Table 8.)

The usual range of relative humidity is from saturation at 4:00 a.m. to 60 per cent to 70 per cent about 3:00 p.m.⁸

As is the case with the temperature, most commercial and subsistence crops of Westmoreland can tolerate high humidities. However, the combination of high temperatures and high humidities may provide optimum conditions for the rapid reproduction of diseases which attack plants, for example the Irish potato "blight."

Relative humidity tends to decrease inland from the

8 Stark, op. cit., p. 5.

coast but is highest on coastal districts, islands and mountainous countries. In General, the relative humidity of Westmoreland is probably uniformly high because of low elevation and a maritime tropical climate. Most districts are easily accessible to the modifying influence of the moisture-laden sea breeze. In the dry season a heavy formation of dew could be of importance to vegetation but high temperatures often reduce this gain.

D. Wind

High wind velocities are rare. The north-east trades which are the prevailing winds of Jamaica have limited influence on Westmoreland, which lies in the lee of the east west trending mountains. Periodic gales and occasional hurricanes, however--especially the latter--can be disastrous. Pimento blossoms may be blown off. Sugar cane may be lodged after which it rots. A hurricane may result in substantial reduction of production for a year or more.

Land and sea breezes are experienced regularly. Some substances heat up more easily than others. This property is expressed in physics as the specific heat of the substance.⁹ Land has a lower specific heat than water,

⁹ The specific heat of a substance is defined as the quantity of heat required to raise the temperature of 1 gram of the substance through 1° C.

consequently the land is heated quicker by the sun. Convection air currents are, therefore, set in motion at a faster rate over the land during daylight hours. As these air currents rise over the land the relatively denser cooler air from the sea flows in to fill the partial vacuum. Sea breezes, which are very refreshing to man and beasts on hot tropical days, are formed in this manner.

Conversely, because of the higher specific heat, water retains heat longer than land. As a result the wind tends to flow from the land to the Caribbean Sea since convection is greater over the Sea which is relatively warmer at nights. A land breeze is, therefore, produced.10

On the whole, the climate of Westmoreland is suitable for the production of tropical crops and for the rearing of animals adaptable to maritime tropical weather conditions.

2. PHYSIOGRAPHY

J. Stark has divided the parish into five physiographic units. They are Swamp, the Central Plain, the

¹⁰ It is realized that the above is a very simplified account of what occurs on a micro-scale with numerous variations. When this takes place on a continental scale monsoon winds are produced.

Coastal Plain, the Shale Hills, and the Limestone Hills and Plateau (See Map 3).¹¹

A. Swamp

The area classified as swamp is the part of the Great Morass which lies in Westmoreland. One estimate is that about 4,500 acres of land will be made available for agriculture and grazing by reclamation of this swamp.¹² There are many other swamps in Westmoreland which are omitted by this classification. Another source estimated that about 11,000 acres of the parish were in morass lands.¹³ Much of this land has already been reclaimed but substantial acreages of swamp were recently located in areas other than the Great Morass. Swamps amount to 1,270 acres of the West Indies Sugar Company's property,¹⁴ and a private farmer estimated that about 300 acres of his property are in swamps.¹⁵ Others were observed during the field work.

11 J. Stark, op. cit., p. 9.

12 Five Year Independence Plan 1963-1968, p. 109.

13 Gleaner Geography, op. cit., p. 22.

14 Interview: D. P. Beckford, Crop Control Officer, West Indies Sugar Company, Frome, Ltd., July 7, 1967.

15 Interview: Andrew Anguilar, Landed Proprietor, Ackendown, July 25, 1967.

Qrasia).



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About 550 acres of swamp have been reclaimed at Meyersfield for the cultivation of sugar cane by the West Indies Sugar Company and operations were in progress to reclaim another 200 acres of that farm in 1967.¹⁶

Most of the swamps of the parish are used as uncultivated pasture for grazing during the low rainfall period. Some are utilized for rice cultivation.

B. The Central Plain

Almost one-fourth of the parish is in alluvial plains.¹⁷ These plains are down-faulted areas veneered with deposits of loam, sand and gravel. Their soils are among the best agricultural lands of the island.¹⁸

Hills of limestone and shale partially surround the Central Plain. The exception is the Coastal Plain to the south. The Central Plain is drained by the Cabaritta, Morgan's Cut, New Savannah and Sweet Rivers. Artificial drainage lines remove excess water from backswamps on either side of the rivers. An important canal, the Styx, supplements

16 Interview: Keith Tavares, West Indies Sugar Company Surveyor, July 2, 1967.

17 Gleaner Geography, op. cit., p. 22.

18 F. Asprey and R. G. Robbins, "The Vegetation of Jamaica," <u>Ecological Monographs</u>, XXIII, (1953), 360-406.

the Cabaritta in the drainage of the lands to the west.

C. The Coastal Plain

Most coastal regions of Jamaica are down-faulted areas which are floored with unconsolidated alluvial and deltaic Pleistocene and recent deposits. Deposition is still in progress in most of these areas.¹⁹

The Coastal plain of Westmoreland consists primarily of mangrove swamps and salina.²⁰ Some of these swamps have been reclaimed and others will be reclaimed as this becomes feasible.

D. The Shale Hills

There are three areas of shale hills. They are in the north-east corner of the parish, the upper Cabaritta Valley and Morgan's Cut north of Grange Hill and the hills to the West. These shale hills of the Miocene and Pliocene periods are characterized by great dissection. Excessive

¹⁹ N. A. Zans, <u>Geology and Mineral Deposits of</u> Jamaica (Kingston, Jamaica: Government Printery, 1953).

 20 A salina is a lagoon from which the water has evaporated. <u>Batis maritima</u> is often found growing on them (<u>Ibid.</u>, p. 14).

runoff from them sometimes results in flash floods on the plains. Land slides are common on the slopes.²¹

E. The Limestone Hills and Plateau

The limestone hills and plateau varies from less than 1,000 feet to over 2,000 feet above sea level reaching its highest elevation at Grange Hill. There are spurs such as Negril Hill and other less prominent outcrops in the south.²² Uncultivated limestone areas of Westmoreland are generally occupied by dense low woodland or scrub.²³ (Compare Maps 3 and 6).

3. SOILS

Parent material, topography and climate are the main soil forming factors.

The soils of Westmoreland have been classified by Stark into the following general categories according to their location:

21 Stark, op. cit., p. 10.

22 Loc. Cit.

23 Lord Olivier, Jamaica The Blessed Island (London: Faber and Taber Ltd., 1931), p. 30.

- Soils on uplands of shales, conglomerates and igneous rocks.
- 2. Soils of limestone uplands.
- 3. Soils of coastal plains, inland basins and alluvial valleys.²⁴

These general categories are further subdivided into a multiplicity of specific soil types, many of which are of minor agricultural significance and occupy very small acreages of arable land. Only soils which cover sizeable acreages are included in the following discussion. (See Map 5).

A. Soils on Uplands of Shales, Conglomerates and Igneous Rocks

"Shoothill Clay and Belfield Clay are the only soils which cover sizeable acreages"²⁵ in this category. They are found in the Lamb's River and Seaford Town districts. Shoothill Clay is also located near Moreland Hill. Both soils have been subjected to severe erosion because they are located on steep slopes on which the drainage is rapid. Erosion tends to be intensified on the Shoothill Clay because of the unconsolidated characteristics of the soil, and the

24 Stark, <u>op. cit.</u>, p. 12.
25 Ibid., p. 13.

poor agricultural practices of peasant farmers who occupy portions of these lands. Belfield Clay, a yellowish-brown silt, is less susceptible to rapid run-off but possesses limitations similar to those of Shoothill Clay.

The Seaford Town and neighbouring districts are the only areas in the parish highly recommended for the production of bananas.²⁶ This is because of the presence of shales in the area. Shales are one of the three most important soil classes in Jamaica for banana production.²⁷ (See Map 4.) Seaford Town is the most important banana-producing district of Westmoreland.

Other soils which belong to this group are the Sudbury Clay, Pennants Clay Loam, Diamonds Clay Loam, Donnington Gravelly Loam and Marymount Clay. Some of these are of almost no agricultural use because they are acidic and of very low fertility. None of these occupy large acrea ages.²⁸ Waitabit clay, a very acidic yellowish clay found on steep slopes must be mentioned because it covers larger acreage than any of the latter group.

²⁶ Jamaica Agricultural Society, <u>The Farmers</u> <u>Guide</u> (Glasgow, Scotland: The University Press, 1962), p. 330.

^{27 &}lt;u>Ibid</u>., p. 332.

²⁸ Stark, op. cit., p. 13.



B. Soils of the Limestone Uplands

Carron Hall Clay which covers much of the transition zone between the Coastal Plain and the Central Plain is a well drained, fertile soil. Stoniness and limestone slopes of some elevations are in places limiting factors to agriculture.

Windsor Stony Clay an acidic soil that occupies basins in the White Limestone Area. "Much of the land is (in) poor pasture carrying livestock."²⁹

Another soil, Lucky Hill Clay, falls in this category. It is fairly fertile, with good moisture retention capacity. Citrus and pasture thrive on it.

There is extensive acreage of Bonny Gate Stony Loam in the parish. (See Map 5). This soil has a thin Ahorizon of substantial organic content which imparts a fair level of fertility. It is to be found at Negril Hill. It is mixed with different soil-types in other areas.

A fifth soil type, Nonsuch Clay, occurs in the limestone uplands. This is a black alkaline, imperfectly drained soil of medium to low fertility. It is also of importance on the plains. It is deficient in potash. Most

29 Ibid., p. 14.



Map 5

of the Nonsuch Clay is utilized in the production of the sugar cane.30

Bundo Clay, and Saint Ann Clay Loam are other subtypes of soils of the limestone uplands. The first is of moderate fertility but very low in phosphate. It is of poor natural drainage and highly acidic. Saint Ann Clay Loam is of low fertility and low acidity. This soil permits rapid run off consequently it experiences moderate to high erosion.31

C. Soils of Coastal Plains, Inland Basins and Alluvial Valleys

Some fourteen soil types are associated with this classification. Therefore, only those of special importance to agriculture and which constitute large acreage are given consideration.

One of these is the Frontier Clay, a poorly drained saline soil near the mouths of the rivers. Large areas are occupied by this soil. When the water is properly controlled, rice flourishes on Frontier Clay.

³⁰ Loc. cit. Although tropical soils are more commonly deficient in phosphates than in potash, the source gave potash as the deficiency.

31 Ibid., p. 22.

Fontabelle Clay Loam is used for the cultivation of sugar cane. It is a fertile, dark grey-brown, deep alluvial soil.

The Shrewsbury Ball Clay and Wallens soils are other soils belonging to this group which support sugar cane. Wallens soils develop from alluvium derived from the limestone areas. Shrewsbury Ball Clay has a dark-coloured top soil which is rich in lime. Both types are important in the middle portion of the Central Plain.

Some soils which occupy large acreages must be drained to make them productive. Agulta Clay and Silty Clay Loam, Roaring River Clay, Four Paths Loam and Tulloch Silty Clay Loam are examples of such soils. Sugar cane thrives on the first and second when they are properly drained. Roaring River Clay and Four Paths Loam must in addition be neutralized for best results since they are acidic. Tulloch Silty Clay Loam surrounds the Cabaritta River as it starts crossing the plain. It is of brown colour with some mottling at depth. This soil is derived from very mixed alluvium. It is also acidic.³²

Riverhead Gravelly Loam, Heartease Stony Gravelly Loam and Yallahs Stony Loam are located at Prospect Park and in neighboring districts. These soils are light in

32 Ibid., p. 14.

texture, very gravelly, and lie on old river terraces. Drought is often intensified on these soils located on undulating to hilly terrain because the soils have very limited water retention capacity and the slope results in large volumes of run-off during heavy rains. The West Indies Sugar Company utilizes these soils and terrain for pasture production and animal husbandry.

Around the edges of the Great Morass is Morass Peat. It is very rich in organic content. The chief vegetableproducing area of the parish is located on this soil.³³

4. VEGETATION

As previously mentioned in the "history of settlement," the majority of the commercial and subsistence crops are non-indigenous. The sugar cane (<u>Saccharum Officinarum</u>), banana (<u>Musa sapientum</u>) and plantain (<u>Musa paradisiaca</u>), citrus (Citrus spp.) cocoa (<u>Theobroma cacao</u>) and ackee (Blighia <u>sapida</u>) were discussed as the chief examples.³⁴

^{33 &}lt;u>Ibid.</u>, pp. 14-15. (The soil classifications are based on the research of the frequently acknowledged sources, the most comprehensive of which was the work of J. Stark. However, the correlation with agricultural land use is primarily the work of the writer who had the satisfaction of observing the main areas under discussion.

³⁴ William Fawcett and Alfred Barton Pendle, <u>Flora</u> of Jamaica, Vol. 5, Part 3 (London: British Museum, 1914), p. 160.

Some ornamental plants and flowers were also introduced from other countries. Examples are Poinciana and tulips. The most important cultivated grasses were brought into the parish. Pangola (<u>Digitaria decumbens</u>) and Guinea grass (<u>Panicum maximum</u>) are the more highly productive grasses.³⁵ Others are Seymour grass (<u>Andropogon pertusus</u>) and "Piano grass" (<u>Themeda arguens</u>).³⁶

Dense forests still prevail on the higher reaches of the uplands and on parts of the high White Limestone. Special efforts are being made by some large property owners, the government and the West Indies Sugar Company to retain the forested areas near the summits for water conservation purposes.

The calabash (<u>Crescentia cojete</u>), trumpet tree (<u>Ceropia peltatia</u>), mahoe (<u>Hybisias elotus</u>) and cedar (<u>Cedrela toona</u>) are some examples of the widely scattered stands to be found in these forests.

Most of the land in the parish has been cleared of its primeval forests and is presently grazed, cultivated or settled. Extensive areas are covered by scrub of varying density. Sections of the scrub-land with its low growing

> 35 The Jamaica Agricultural Society, <u>op</u>. <u>cit</u>., p. 662. 36 Stark, <u>op</u>. <u>cit</u>., p. 10.

evergreen plants are cleared and cultivated in gardens. Some parts are settled. Scrub occurs mainly on the limestone hills of Westmoreland (See Map 6).

5. WATER SUPPLY

Water collected from rivers, rainfall and springs forms some of the primary sources of domestic water supply in the parish. The population on the hilly to mountainous three-quarters of the parish is over-dependent on these sources, which vary considerably in dependability of supply from one season to another.

The Parish Council maintains a number of catchment tanks but the great majority of them were constructed to satisfy a demand which has long exceeded the supply. They become dry early in the December to March low-rainfall period.

This lack of foresight of the initial planners causes undue hardship and inconvenience to the population and their livestock during the dry season each year. Attempts made by the Parish Council to supplement the limited supply by trucking water to homes are very unreliable, inadequate expensive and time-consuming. (Appendix VI, No. 2)

In the townships on the plains and in some districts,



piped water is more widely distributed than on the hills where even stand pipes are scarce. The problem of the inhabitant of the plains may be as great as that of his fellow man on the hills. Stand pipes (by roads) may be over a mile from some farmers. Often the water pressure is too low for the precious liquid to ascend the slightest gradient. Savanna-la-Mar, the chief town, has an inadequate water supply. Other important centres such as Grange Hill and Little London rely on stand pipes which flow intermittently. Little London has pipes which are connected with the main source of piped water for the parish, the Roaring River. However, its pipes are often without water for most hours each day when the total demand is greatest. The pressure proves insufficient at such periods.

The National Water Authority has a plan to increase the pressure and the supply of water in the parish at an estimated cost of \$102,180 (L 39,000)³⁷

The 1960 population census shows that approximately one-third of the households which had water piped into the yards or dwellings were centred in Savanna-la-Mar. Almost forty per cent (39.9%) of all the households of the parish depend on river, stream, pond and well for their water supply.

37 Interview: The Assistant Superintendent, Public Works Department, Sav-la-Mar, February 6, 1968.

Pipes in yards and homes, stand pipes and catchment tanks (as a group) supply the greater percentage (59.1%) of the households with water for domestic purposes. Ponds are probably the chief source of water in the parish for livestock. (See Table 9)

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Westmoreland's water supply as a whole is inadequate. Total potential annual supply is adequate but the storage facilities need improvement.

TABLE 9

PRIVATE HOUSEHOLDS CLASSIFIED BY THE KIND OF WATER SUPPLY AND THE PLACE OF RESTDENCE 36

						1
PLACE OF			KIND ()F WATER SI	JPPLY	
RESIDENCE	TOTAL PRIVATE HOUSE- HOLDS	PIPED INTO DWELLING	PUBLIC SUPPLY PIPED INTO YARD	PRIVATE CATCH- MENT NOT PIPED	PUBLIC STAND PIPE AND PUBLIC TANK	RIVER STREAM POND AND WELL
Westmoreland	26,565	166	5,149	1,442	8,389	10,594
Sav-la-Mar	2,669	296	1,746	Ħ	597	19
Rest of Westmoreland	23,896	695	3,403	1,431	7,792	10,575
Sav-la-Mar as Percentage of Westmoreland	OT	29.9	33.9	w.	7.1	5
Total in each category as Percentage of 26,565 Households	100	3.7	19.4	5.4	31.6	39.9
36 Jamai (Ki (.ca Tabulat .ngston, Ja (Percentage	ion Centre, maica: Dep calculatic	<u>Census o</u> artment cons ns were n	f Jamaica, f Statisti ade by the	Vol. 2 Part cs, 1960), p.	an m

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CHAPTER IV

PLANTATION AGRICULTURE

Cumper and Norton give the approximate geographic limit of plantation agriculture in Westmoreland as the 250-foot contour. The region, thus enclosed, consists of an extensive area of alluvial soils on level or rolling terrain on which large scale sugar cane cultivation is practised.¹ (See Maps 7 and 8.). On Map 7, number 4 depicts the alluvial plain which is the area of plantation agriculture. There is a substantial amount of peasant farming in the parish but the predominant activity in the defined region is the cultivation of sugar cane on large farms situated on alluvial soils.

Plantation agriculture is practised by a corporate firm, the West Indies Sugar Company, Frome, Limited (Appendix VI, No. 3). Its factory is the leading sugar processor in the island. Agriculture as practised by this Company possesses certain peculiarities. It is the objective of this chapter to define and explain them. A presentation

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¹ A. V. Norton and G. E. Cumper, "'Peasant,' 'Plantation,' and 'Urban' Communities," <u>Social and Economic Studies</u>, Vol. 15, No. 4 (University of the West Indies, Jamaica: Institute of Social and Economic Research, December 1966), p. 342.

is made of the following in order to achieve the above aims:

- 1. Definition, advantages and limitations of the plantation system.
- 2. Its history and development.
- 3. The structure of the enterprise.
- 4. Sugar cane and livestock production by the Company.
- 5. Mechanization on the Frome Estate.
- 6. Trends in plantation agriculture.
- 7. The Company's role in settlement.
- 8. Its recreational land use.
- 9. The contribution of the Company to the economic, social and cultural life of Westmoreland.
- 10. A summary of the plantation system.

1. DEFINITION, ADVANTAGES AND LIMITATIONS OF THE PLANTATION SYSTEM

Plantation agriculture has been defined as a type of cultivation which derives its income from staple products. The key feature of the plantation system is the use of hired labour under management supplied by the factory. It is a large-scale processing unit which secures its necessary volume of raw materials by engaging in a collateral largescale enterprise.²

Some general advantages of the plantation system are its easy access to capital and its superior management and cultural practices. Cross-hauls are eliminated because independent growers are not favourably situated in relation to any other mill. The plantation as a whole benefits from the economies of large-scale production. Sugar canes respond well to modern land use technology.³ This is an important factor in favour of the large-scale producer whose easy access to capital enables the entrepreneur to make the necessary expenditure. Consequently, above average yields are often achieved.

Its chief limitations are high overhead costs which may become oppressive in periods of low prices. Frome has a near-monopoly as the exclusive market for growers' sugar cane, and full control of the rail network in the parish. The near-monopoly of the market is modified by government control. Government agencies and trade unions negotiate with management to grade the juice and fix the price which is paid to the grower. Prices are established on the basis of the sucrose content of cane and in relation to the price of world sugar.

³ <u>Ibid.</u>, p. 72.

² Vladimir P. Timoshenko and Boris C. Swerling, <u>The</u> <u>World's Sugar Progress and Policy</u> (Stanford, California: <u>Stanford University Press</u>, 1957), p. 70.

2. HISTORICAL DEVELOPMENT OF SUGAR PRODUCTION AT FROME

Jamaica received her first sugar canes soon after the Spanish colonization of the island in 1509. An early record of sugar production in the country dates back to 1527.⁴ Spanish occupation of Westmoreland was coastal and was limited in extent. This limited Spanish occupancy continued until the British conquest (1655). During the intervening fifty years Westmoreland was seldom visited by the British. The Spaniards had returned to Spain soon after their defeat.

British colonization began in the early eighteenth century. Initially, during the British occupancy many small sugar estates and factories were scattered over the George's Plain. At the end of the nineteenth century, twenty-two factories were operating.⁵ In 1937, eleven estates and three factories, Frome and Masemuir in Westmoreland, were consolidated through purchase from one James Charley by the West Indies Sugar Company. The "Morris Group," consisting of three factories at Shrewsbury, Friendship and Blue Castle,

⁴ E. F. Tacke and A. S. Stepanov, <u>The World Sugar</u> <u>Economic Structure and Policies</u> (London: International Sugar Council, 1963), p. 8.

⁵ C. A. Bloomfield, <u>Sugar in Jamaica</u> (Lionel Town, Jamaica: W. I. S. Co. Printery, Ltd., <u>/n.d.</u>, Appendix I.

and five estates were also purchased in that year. A seventh factory and farm at Mint completed the acquisition. In 1938, the Company constructed Frome Central and demolished the seven small factories which had a combined production of some 22,000 tons.

The new factory's capacity exceeded the available supply of raw cane. In order to expand the supply, free technical advice, loans and better varieties of cane were provided to small and large farmers by the Company.⁶ Frome Central has continued its expansion. The number of farmers and the percentage of production they deliver to the factory has increased significantly. Processing facilities were expanded significantly in 1954 and again in 1960. Another tandem was added and the boiling capacity was increased in 1960. It is the only factory with two tandems in the island.⁷

A 1967 purchase of the George's Plain property has added to the holdings of the Company. Some 2,458 acres were bought, together with the existing equipment.⁸

⁶ The West Indies Sugar Company, <u>W.I.S. Co. in Jamaica</u>..., p. 8.

7 <u>Ibid</u>., p. 11.

⁸ Unpublished typed manuscript: Land Utilization Commission "Total Acreage of Agricultural Units Listed and Acreage Believed Idle or Under-utilized by Parishes--1967."

As its largest enterprise, the factory has become the focal point of economic activity in the parish.

3. STRUCTURE OF THE ENTERPRISE

As can be seen from the above discussion, the Company's property in Westmoreland is divided into a number of farms with the Frome factory as the focal point. Frome, Masemuir, Barham, George's Plain, Cornwall, Mint, Shrewsbury, Prospect Park and Meyler's Field are examples of these subdivisions. Each farm has a general overseer, a scale, one or more cranes, an office, and employees' residences. Most farms are linked by Company-constructed tranways to Frome Central.

A general manager supervises the entire system. Specialists - university graduates or well-experienced employees - head the several administrative divisions. Examples of these are the factory, cultivation, communication and transport, survey, industrial relations and livestock department.

The Company's property today aggregates 29,014 acres.9

⁹ Interview: D. P. Beckford, Crop Control Officer, W. I. S. Co., July 7, 1967.

4. SUGAR CANE AND LIVESTOCK PRODUCTION

The production and processing of sugar cane are the major activities of the Frome estate. Livestock rearing is its only other important agricultural activity. There are non-commercial plots of citrus, bananas and vegetables for employees' subsistence use. Small citrus groves and ornamental plants are maintained by the Company. Its well tended hibiscus hedges are beautiful additions to the cultural landscape. Some commercial crops are also produced by employees. Rice (<u>Oryza sativa</u>) and ground provisions¹⁰ belong to this category.

Table 10 shows the distribution of crops by acreage, other forms of land use and "non-cultivated"¹¹ land which is owned by the West Indies Sugar Company in Westmoreland. Sugar cane occupies 49.6 per cent and pasture 17.3 per cent. Of the 950 acres of grazeable land at Prospect Park, approximately 630 are improved and 320 unimproved.¹²

10 Ground provisions are tubers. They are starchy foods such as yams (<u>Dioscorea spp</u>.), cocoes (<u>Colocasia</u>), and dasheen (<u>Colocasia antiquorum</u>) which bear in the earth.

ll "non-cultivated" is used to mean lands which are currently unsuitable for tillage by mechanical methods. Most of the area is designated as forests.

12 Interview: G. Boothe, Overseer, Prospect Park, July 6, 1967. Pasture could be subdivided into improved and unimproved categories but this classification was only available for Prospect Park, one of the major livestock farms.
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TABLE 10

WISCO CLASSIFICATION OF FULLY UTILIZED AND NON-UTILIZED LAND IN WESTMORELAND-196715

		CATEGO)RIES		
Ful	ly Cultivate	ed land	-uoN	cultivated	l land
Type of Use	Acreage	Percentage of Total Acreage Owned in Parish	Description	Acreage	Percentage of Total Acreage Owned in Parish
Sugar Cane	13,174	49°6	Forests	3,670	13.8
Pasture	4,590	17.3	Swamps	1,270	4.8
Factory and other, e.g. clubs, offices	802	3.0	Other: ponds, ruin- ate, etc.	102	4.
Sublet for various uses	1,042	3.9	6	e I	8
Playgrounds	100	4.			
Settlement (estimated)	200	& •		8	4 1 1
Roadways and intervals	1,606	6.0			8
Total	21,514	81.0	Total	5,042	19.0
15 D. P.	Beckford,	om. cit.			

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A. Livestock Production

The management of the Company's cattle production hinges on the rearing of beef cattle, mostly range-fed, feedlot operations, and the maintenance of an experimental farm.¹³ The degree of implementation of these factors varies from one farm to another. Much depends on the initiative and efficiency of the overseers. One overseer, a Jamaica School of Agriculture graduate, explained that he followed the principle that the least expensive feed for cattle is grass and the most economic method of harvesting it is to let the animals reap it themselves.¹⁴ Prospect Park, which he supervised, was one of the most successful livestock farms visited in Westmoreland. Its luxuriant Pangola (<u>Digitaria decumbens</u>) pastures and well-fed herds justify the policy for that location.¹⁶

The chief livestock farms of the Company are at Cornwall, Prospect Park, Shrewsbury, Friendship, Masemuir, Dean's Valley and Meyler's Field. The total number of cattle

13 Interview: L. W. Pringle, Overseer and Acting Livestock Supervisor, Cornwall, July 10, 1967.

14 Interview: G. Boothe.

16 The Jamaica Agricultural Society, <u>The Farmers</u>^{*} <u>Guide</u>, pp. 286-287. (Pangola grass is a hardy, highyielding and nutritive fodder.)

on all Company farms in June, 1967 was 2,060 head.17

Careful research has established that the foundation for cattle production in Jamaica is grass. It is believed to be more economical to produce cattle on fertilized grass than on feed lots by feeding concentrates to cattle.

Experiments at Grove Place Animal Production Research Station are showing that Pangola pasture top dressed annually with 2 cwts. Sulphate of Ammonia and 1 cwt. Muriate of Potash to the acre are carrying for an entire year an average of 2.5 steers per acre which actually means an average gain of 1000 lbs. live weight to the acre.¹⁸

However, the uses of the feedlot cannot be ignored. It currently takes 30 months for heifers and steers to weigh 1,000 pounds on non-irrigated farms without feedlots. On irrigated farms of pangola (<u>Digitaria decumbens</u>) and guinea grass (<u>Panicum maximum</u>) where the application of fertilizer is heavy, that weight is achieved in 24 months. Cattle bred in feedlots are yielding 1,000 pounds per head in 18 to 20 months. Because of the higher feed conversion ratio and probably the better quality beef produced in feedlots than on pastures, some large Jamaican farmers are fattening livestock in feedlots during the final three or four months before marketing the cattle.¹⁹ It is a useful means of saving time

17 Interview: L. W. Pringle.

18 The Jamaica Agricultural Society, <u>The Farmers</u>^{*} <u>Guide</u>, p. 661.

19 P. L. M. "Feedlot - a Revolution in Beef Production," The Farmers' Weekly (Saturday, August 5, 1967), p. iv. by providing surroundings for animals to enable closer observation and experimentation. Major disadvantages are high capital costs for buildings and the cost of concentrated feeds.

The Company fattens steers in the feed lot at Cornwall and on pastures at Meyler's Field. Cornwall is an experimental farm for various species of grasses and in artificial insemination. Selective breeding and the weaning of calves are other aspects of livestock rearing on this farm.

Jamaica Black, Charolais and Jamaica Brahman are the types of beef cattle raised on the farms of the Estate.²⁰ Selection of animals with varying percentages of Aberdeen Angus, Brahman and "Creole" has produced the Jamaica Black. It is suitable to Jamaican climatic conditions and is an intermediate between the Zebu and the Brahman. Jamaica Black are exported to South American countries where they thrive well in feed lots and on pastures. They produce a reasonably good quality of beef. At maturity, bulls weigh 1,200 pounds and cows 1000.²¹

21 Jamaica Agricultural Society, <u>op</u>. <u>cit</u>., pp. 655-656. "Creole" cattle are the descendents of the livestock brought to Jamaica by the Spaniards. "Jamaica Black" is both singular and plural like "sheep."

²⁰ Interview: L. W. Pringle.

Charolaise is a French breed which is doing well and is gaining popularity in the island.

Indian cattle were introduced to Jamaica in the early eighteenth century. They continue to bear the names of their native provinces, Nellore, Hissar, Giyrat and Mysore. In 1948, efforts were made to develop Indian breeds, except the Mysore, by selective breeding into a beef cattle. Success has resulted from these efforts and cows are being produced which weigh to 1,200 pounds. Mature bulls may weigh 1,800 pounds. Jamaica Brahmans, the derivation, are among the most efficient producers of beef under Jamaican conditions.²² The Company is pursuing a successful breeding programme based on them.

(a) Care and Management of the Livestock Farm

Care and management are key factors in livestock production. Beef cattle husbandry demands a comprehensive knowledge of breeding and feeding methods. It is through the medium of care and management that the scientific principles of genetics and nutrition are applied.

On the livestock farms of the Frome estate, special

22 Ibid., p. 665.

attention is paid to the cultivation and care of pasture, selective breeding, rotational grazing, feed lot maintenance, and control of cattle pests and diseases.

(1) Pasture Care

One pre-requisite of cattle rearing is the establishment of pastures. Livestock operations should be begun only after good pastures are established. Pangola (<u>Digitaria</u> <u>decumbens</u>) pastures, when well prepared, can be grazed in two months. Unprepared soils take a year or two to grow adequate stands, depending on the moisture, soil and slope characteristics.²³

Plantation agriculture, as represented by the Frome Estate, possesses the space, capital, technology and managerial skills which permitted the farms to be established and cared for efficiently.

Barbed wire fencing of paddocks,²⁴ frequent eradication of weeds, and fertilization are expensive aspects of the maintenance of these pastures. Commercial fertilizers are added twice yearly on the Prospect Farm at the rate of four hundred-weights per acre each year. Noxious plants

23 Ibid., p. 661.

 24 A paddock is a pastoral division of fifteen acres.

are controlled by the application of herbicides. Hay or Wire Grass (Sporobolus indicus), Shame-bush or "Dead and wake" (Mimosa pudica) and Piano Grass (Themeda arguens) are the chief noxious plants on these farms.²⁵ Wire grass, when young and succulent, is a useful fodder but as it gets old it becomes wiry and almost useless to animals.²⁶ Mimosa pudica have very sharp spines and their habit of spreading makes it difficult to eliminate them mechanically.27 Although Piano Grass (Themeda arguens) is a valuable plant when cultivated for fodder, it is regarded as a noxious grass when found where it is not wanted. It is a resistant plant which is difficult to control and competes with Pangola (Digitaria decumbens) for moisture and nutrient. Therefore, the Company tries to eradicate Piano Grass (Themeda arguens). Mixtures of a herbicide, sodium trichloracetate, is recommended for the control of this species.28

Proper nutrition and care are very important managerial practices in order to build up the resistance of animals

25 G. Boothe, op. cit. (The botanical names were established from The Farmers' Guide, pp. 778-781.

²⁶ The Jamaica Agricultural Society, <u>The Farmers</u>^{*} <u>Guide</u>, p. 274.

> 27 <u>Ibid</u>., p. 778. 28 <u>Ibid</u>., p. 781.

to disease and to control insect pests. Management is a major factor in the elimination of animal diseases.

(2) Control of Pests and Diseases

Continuous care is taken to control cattle pests and diseases. Animals are sprayed with insecticides such as Coopertax and Assuntal mixtures. It is essential to change the chemicals used regularly because ticks and other external parasites develop immunity to them. Regular spraying has resulted in effective control of tick fevers on the West Indies Sugar Company farms.²⁹ Tick fevers, <u>Anaplasmosis</u> (gall sickness) and <u>Piroplasmosis</u> (Red Water fever or Texas fever) are caused by protozoal parasites which infest the bloodstream.³⁰ Ticks are external parasites which, apparently, are carriers of the internal ones.

Blackleg or symptomatic anthrax, a fatal disease caused by the organism <u>Clostridium chauvoei</u>, has been almost totally eradicated on farms of the Frome estate.³¹ Cattle are most susceptible to blackleg between the ages of four months, and two years and six months, but all age groups have been affected. Heavy soil under permanent pasture

29 Boothe, <u>op</u>. <u>cit</u>.

³⁰ The Jamaica Agricultural Society, <u>op</u>. <u>cit</u>., p. 929.
³¹ Boothe, <u>op</u>. <u>cit</u>.

appears to be the most conducive environment for the blackleg bacteria.³²

Special care is taken to eliminate <u>Mimosa pudica</u> on W. I. S. Co. farms because of its leaf spikes which pierce soft animal tissue and lead to infection. The conditions known locally as "lumpy jaw" (<u>Actino mycosis</u>) and "wooden tongue" (<u>Actino basinosis</u>) are the adverse effects of such infection.³³

(3) Selective Breeding

Other less spectacular aspects of the care of cattle are the inspection of herds, the rearing of the calves and pedigree sires, and selective breeding to produce steers which gain weight rapidly. Great emphasis is placed on the maintenance of bull and herd. If the thriftiness and pedigree of the sire are unsatisfactory, the progeny may not produce adequate weight gains to ensure the economic productivity of the enterprise. Sires which are not favourably endowed are, therefore, discarded. Accurate records of calving are very vital to show the productivity of the herd. It permits

32 Jamaica Agricultural Society, <u>op</u>. <u>cit</u>., p. 878.

33 Boothe, op. cit.

the elimination of less desirable animals. A minimum of one calf per year should be obtained from each mature cow. The Company obtained a calf crop of 87 per cent in 1965.³⁴ This was good but can be improved. Some large Jamaican farms have calf crops of 90 to 95 per cent.³⁵

Artificial insemination is practised at Cornwall with the objective of upgrading the herds. Semen is sometimes imported and used for cross-breeding purposes.³⁶

(4) Rotational Grazing

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Rotational grazing is practised on the Prospect Park and Meyler's Field farms in the following manner: the property is divided into 15-acre paddocks, three of which paddocks form a "block." Each herd of forty to forty-five cattle or their equivalent grazes one paddock for three or four days before it is driven to a new pasture.

Most characteristics of the rotational grazing practice are similar to the recommendations of the Jamaica Agricultural Society. Two exceptions are the size of the

34 The West Indies Sugar Company, <u>Annual Report for</u> <u>Beef Herd for the Year Ending 30th September, 1966</u>, p. 1. 35 Jamaica Agricultural Society, <u>op</u>. <u>cit</u>., p. 671. 36 Pringle, <u>op</u>. <u>cit</u>. paddocks and their carrying capacity. The Society had suggested five-acre paddocks. In addition, the carrying capacity of six to ten animal units per paddock is considerably greater than that of the Estate.37

It is not possible to state the average carrying capacity of all the estate livestock farms since some cattle get supplementary feeding in the form of concentrates or cane stalks. However, one overseer whose beef cattle depended entirely on grazing carried a calculated estimate of 1.25 head per acre on his farm.

The chief sources of water for the Company's livestock are ponds, rivers and springs. These sources are cared for and cleaned by the Company. Cornwall, where piped water is available, is an exception.

The apparent effects of livestock production as part of the plantation system are the improvement of pasture, the quality and breeds of cattle, management practices and livestock productivity, the standard of living, and the diet of the parish.

³⁷ Jamaica Agricultural Society, <u>op</u>. <u>cit.</u>, p. 664. (An animal unit means that one cow equals two yearling cattle or four calves or seven sheep or fourteen lambs.)

B. Sugar Cane Production

Sugar cane enjoys primacy both as an agricultural and an economic activity on the Estate. Table 11 shows that approximately fifty per cent (49.6%) of the land owned by the Company in the parish is occupied in the cultivation of the sugar cane. Another 10.2 per cent is connected with the sugar industry in varying degrees as factory and office space, area reserved for employees' residences, spaces for clubs, and land for railways, roads and "intervals."38 When an allowance is made for the 19 per cent of the property which is uncultivated land, the overwhelming importance of sugar cane production in this plantation system becomes exceedingly clear. This subsection will, therefore, attempt a description of the methods of producing the crop, and its product and by-products. The general economics of the industry and production trend are discussed. Marketing will be discussed in a subsequent chapter.

(a) Planting and Care

Cane fields are established from cuttings. Short

³⁸ "Intervals" are turfed transportation paths between plots of sugar cane. These grow grass which is cut periodically. Local residents, who obtain the permission of the Company, cut Para Grass (<u>Brachiaria mutica</u>) from them to feed their livestock.

lengths of sugar cane are cut off, containing three joints with buds or "eyes." Each bud normally grows into a new cane. New varieties of canes are also propagated from seeds in laboratories. Natural cane seeds are produced in a picturesque flower which is called the "cane arrow." The new plants grow from cuttings taken twelve or more months to reach maturity. At maturity, they reach a height of ten to fifteen feet.³⁹

As is the case in other economic plants, sugar cane must be weeded and fertilized, pests and diseases must be controlled, and the best yielding and most resistant varieties cultivated. The plantation system attends to these aspects of production with considerable efficiency and extensive use of scientific knowledge and technological skills.

The research branch of the Sugar Manufacturers' Association studies the application of fertilizers, variations in water table and its influence on cane, the influence of spacing, and the use of herbicides.

Controlled burning of cane prior to harvesting has tended to result in an increased use of herbicides for weed control on the plantation. The chief ones currently used

39 Bloomfield, op. cit., p. l.

are 2-4-D- (iso-octylester), dalapon and Gramoxone. Care must be taken in the application of Gramoxone for it will scorch the young canes.⁴⁰ Manual weeding is also practised. Weeding frequency and the regularity with which herbicides are applied vary with the secondary vegetation, physiography and micro-climate. A minimum of one chemical and one manual attempt is made annually to control weeds on the plantation.

Cane flies (<u>saccharosydne saccharivora</u>) are controlled by early application of malathion, an insecticide, to the cane fields. Company canes are sprayed by aircraft.

Irrigation and drainage are other forms of care for the sugar cane. Excessive water leads to rotting and low yields. Inadequate water supply also decreases the yield. Overhead irrigation facilities are established in a few areas, for example Meyler's Field, to provide an adequate supply during the low rainfall period. Run off accumulates in the Fontabelle Morass and at Meyler's Field during heavy rainfall.⁴¹ Large drainage ditches have been dug and the Cabaritta River has been dredged to carry the increased

40 The West Indies Sugar Co. Ltd., Frome Division, Annual Report of the Cultivation Department for the Year Ending September, 1966, p. 5.

41 Beckford, op. cit.

volume of water which accumulates from much precipitation. Drainage costs are high but it is hoped at the completion of the projects to reduce the overall drainage costs with time.

Cane varieties have changed over the years as new types with better juice quality and greater resistance to viruses, such as mosaic and chloratic streak and other pests, replace the old. The most dominant variety in Jamaica today is the B4362. Its juice quality is good but it tends "to lodge and rot," hence it is being replaced by other varieties,⁴² such as the B51410, which is a heavy yielder, especially at Frome, with a juice quality comparable to that of B4362. "Its ratoon yields are better than its plant erop yields."⁴³

Two applications of fertilizer are top-dressed on these farms at an average of two to three hundred weight per acre. The main types used are muriate of potash, sulphate of ammonia and superphosphate.⁴⁴ Cane needs ample nitrogen for optimum growth. The amount of inorganic fertilizer applied varies with the level of rainfall and the available irrigation.⁴⁵ Less is required in the drier

42 The Alk-Island Jamaica Cane Farmers' Association, Twenty-Sixth Annual Report, 1967, p. 29.

43 The All-Island Jamaica Cane Farmers' Association, Silver Anniversary Report 1941-1966, p. 37.

⁴⁴ H. S. Ive, Cultivation Manager, July 7, 1967.
⁴⁵ Jamaica Agricultural Society, <u>op</u>. <u>cit.</u>, p. 320.

areas of the island, partly because there is a reduction in the amount that is lost by solution and percolation. A first application of fertilizer is made as early as possible, after reaping. This is followed by a top dressing of the ratoon crop nine to sixteen weeks later.

The ration crop grows up from the "stools" left in the ground from the previous harvest. Cultural practices are employed similar to those employed with first crop or plant cane. Five or six ratoon crops may be harvested until decreasing yields make it necessary to replant.⁴⁶

(b) The Cane Harvest

Harvest is referred to locally as "crop." It continues from December to June but may last until July.⁴⁷ Each cane is cut with a machete as near to the surface of the ground as possible. Burning removes excess trash and diminishes insects, both of which may be a source of annoyance and discomfort to cutters. From nearby farms the cane is subsequently loaded on trailers and transported by tractor to the factory. On more distant farms it is transported to rail-side scales where it is weighed,

46 Bloomfield, <u>op</u>. <u>cit</u>., p. 1 47 Ibid.

recorded, and transferred to trains for transport to Frome Central. Formerly, loading was performed manually. A number of mechanical loaders has been in use since 1967 and their use is increasing.

Sugar cane which has been cut for twenty-four hours begins to become stale.⁴⁸ Staleness lowers the sucrose content of the canes. An efficient loading and transportation system is therefore very essential to eliminate loss from this cause.⁴⁹ The Company has plans for improvement in these areas.

The duration of the harvest is another important aspect of sugar cane production. An over-extended harvest creates additional transportation problems and deterioration in the sucrose content. The most economic period for the harvesting of sugar cane in Westmoreland is from the beginning of December to the end of May.⁵⁰ The Company would like to complete its harvest by the end of April but has been forced to continue until July on a number of occasions because of labour and mechanical problems. A late crop coincides with the first heavy rainfall period of the year.

⁴⁸ Timoshenko and Swerling, <u>op</u>. <u>cit.</u>, p. 71.

49 The All-Island Jamaica Cane Farmers' Association, Silver Anniversary Report 1941-1966, p. 35.

⁵⁰ The West Indies Sugar Company, <u>W. I. S. Co. in</u> Jamaica, p. 11.

This saturates turfed intervals and retards transportation. Heavy rains cause a fall in the percentage of sucrose in mature canes.

Electrical and mechanical failures are causing loss of valuable time during harvest. Sometimes two or three days are lost when grinding stops for these reasons. Table 11 shows that the average length of the harvest for the six years from 1961 was 189 days. The shortest harvest lasted 162 days during that period. The longest was 221 days.⁵¹ At Frome the farmers' cane is harvested under a quota system. This system attempts to secure an adequate supply and to avoid a surplus or an irregular daily storage of raw cane for the mill.

(c) Sugar Manufacture

Sugar manufacture involves scientific and highly technical processes. An attempt is made, therefore, to present a general treatment of the main characteristics of this phase of the sugar industry at Frome.

The factory and its immediate machine shops and

⁵¹ The West Indies Sugar Co. Ltd., Frome Division, Annual Report of Factory Division for Year Ending 30th September, 1966, Section 12, p. 1. The 1966-67 data were extracted from the All-Island Cane Farmers' Association, Twenty-sixth Annual Report, p. 25, and Table 7.

TABLE 11

DURATION OF HARVEST -- FROME FACTORY

T +			"Cro	p" or Harvest		
T COURS	1961/1962	1962/1963	1963/1964	1964/1965	/1966	1966/1967
Date of Start	November 28, 1961	December 4,,1962	November 26, 1963	November 24, 1964	January 19, 1966	November 11, 1966
Date of Completion	June 1, 1962	June 14, 1963	June 2, 1964	July 2, 1965	July 20, 1966	May 7, 1967
Total Num- ber of Crop Days	185	193	190	221	183	162
Avera£	ge Number of 1	Days == 1 89		والمؤكف مستعمل والمعارفة معامل والمعارفة والمعارفة والمعارفة والمعارفة والمعارفة والمعارفة والمعارفة والمعارفة		

offices occupy about ten acres.⁵² They form the nucleus of sugar manufacture in the parish. As the cane arrives, it is placed into a pit, from which it is conveyed mechanically to the cane-crushing mill. The processes include the passing of canes through shredding knives and crushing rollers which break up the hard rind and expose the inner fibre. From here they are passed on to squeezing rollers. Water is sprayed on the crushed canes at intervals to assist in the maximum extraction of the juice. "The cane juice which is extracted by the rollers contains about 13% of sugar and $2\frac{1}{2}$ % of impurities, and the rest is water."⁵³

Bagasse, the fibre, which remains after the extraction of the juice, is used as fuel. Lime is added to the heated juice to promote the extraction of impurities, which may be skimmed off or allowed to settle.

Subsequently, the clear juice is concentrated in evaporators for the removal of water. A system of "multipleeffect evaporators" enables the achievement of maximum evaporation with minimum steam consumption. The concentrated juice from the evaporators is conveyed to vacuum pans where it is steam heated and boiled until a mixture of "massecuite" of sugar crystals and syrup is formed. Centrifugal machines

52 M. C. Frederick, Factory Manager, July 8, 1967.

53 The West Indies Sugar Co., <u>W.I.S. Co. in Jamaica</u>, p. 18.

rotate the massecuite rapidly to separate the sugar crystals or "raw sugar" from the molasses.⁵⁴

"Raw sugar" is the most important product manufactured at Frome. Production for the period 1965-67 averaged 97,025.15 (long) tons annually.55 There are, however, important by-products such as rum, molasses, "filer press muck" and bagasse. "Filter press muck" has an average yearly production of about 18,000 (long) tons. It is used as a fertilizer.⁵⁶ An average of 31,113.67 (long) tons of molasses was manufactured yearly from 1965 to 1967.

The chief equipment directly utilized in the manufacture of sugar and its by-products at the factory are the mill, vacuum pans, distilleries, evaporators and centrifugal machines.

5. MECHANIZATION ON THE FROME ESTATE

The word "mechanization" often conjures up images of increasing unemployment in under-developed countries. Whether this is justifiable or not is beyond the scope of this section. An attempt will be made to show the extent

54 Bloomfield, op. cit., pp. 1-2.

55 The All-Island Jamaica Cane Farmers <u>Twenty-Sixth</u> <u>Annual Report 1967</u>, Tables V, VI and calculated from the total tons of sugar for the three years.

56 M. C. Frederick, Factory Manager.

to which plantation agriculture is mechanized. Discussions on the social and economic effects of mechanization in the parish will be dealt with in the chapter on "Problems and Solutions." The effect of mechanization on the productivity and economics of the plantation system and its characteristics will be discussed in the following paragraphs.

Jamaica earns what has been euphemistically described as the "doubtful honour" of producing sugar at the second highest cost of production in the West Indies of a number of countries which submit sugar production costs under the Commonwealth Sugar Agreement.⁵⁷ It costs an estimated \$105.60 (Canadian) (±40) to \$118.80 (±45) to produce one (long) ton of sugar at Frome.⁵⁸ The World Free Market price for sugar is well below the cost of production of the most efficient Jamaican producers. It fell to an all-time low of \$34.32 (±13) per (long) ton in London in May 1967.⁵⁹ Generally, the price of world sugar is lower than at any time in the last two decades.⁶⁰ This means that the less

57 The All-Island Jamaica Cane Farmers' Association, Twenty-sixth Annual Report 1967, p. 9.

 5^8 Very reliable but confidential source who prefers to remain anonymous.

59 The All-Island...<u>Twenty-sixth Annual Report, 1967</u>, p. 3.

⁶⁰ The W. I. S. Co. Frome Ltd., <u>Directors' Report</u> and Accounts for Year Ending 30th September, 1965, p. 13.

competitive producers have to improve their efficiency and lower their costs of production. Cane loading and other less favoured tasks associated with the industry are perennial problems at Frome and most other estates throughout the island. The supply of labour for these jobs is scarce and unreliable.

Attempts have been made at Frome to improve the factory's efficiency and productivity by the introduction of cane-loading machines. Three cane loading machines were installed initially in 1967. About fourteen cane loaders would be required to adequately serve the needs of the Company.⁶¹ Other major mechanical installations were centred around the cane yard, boiler, evaporation, clarification and the centrifuges. These additional capital investments have raised the factory output potential by about fifteen per cent.⁶²

The daily functions of an enterprise as extensive as the West Indies Sugar Company, Frome, Limited requires numerous machines for transportation, communication and the manufacture of products. This is a distinctive feature which separates Frome from the other large farms or "plantations"

61 H. S. Ive, Cultivation Manager.

62 The West Indies Sugar Co. Frome Ltd., <u>Annual</u> <u>Report, 1966</u>, p. 2.

of the parish.

Two hundred and nineteen vehicles are owned and operated by the estate. One hundred and seventeen of these are wheeled and crawler tractors. Wheeled tractors are used for the transportation of cane and other goods and the crawler tractors are utilized primarily for tillage. Other types of machines owned on the farm are sugar trucks, land rovers, cars and jeeps for the personal use of heads of departments, trains to transport the sugar cane, road equipment such as rollers and graders, excavators, and fire pumps for property protection. (See Appendix IV.)⁶³

These machines are serviced and supplied with fuel in the workshops of the Company. Minor repairs are performed by mobile crews in the field.

Many areas of the Estate's production are undermechanized. Cane-cutting, for example, is done manually. More mechanical loading would be desirable. Weeding, planting and fertilization are performed manually in varying degrees. These are done mechanically at one of the Company's subsidiary plants in British Honduras where labour is scarce, with good results.⁶⁴

63 Levy McGregor, B.Sc. (Engineering), Transport Overseer, July 10, 1967.

64 R. H. Maston, M.Sc., Tractor and Transport Manager, July 5, 1967.

The tractor units of the Estate met 70.44 per cent of the transport demands of the Company in 1966. Hired vehicles were used to satisfy the remaining 29.56 per cent. There is a disadvantage in the hiring of private transport by the Company. Private tractors are more expensive transport media than that which is supplied by the Company.⁶⁵ This increases the cost of production at a time when a reduction is essential.

6. TRENDS IN PLANTATION AGRICULTURE

The main trends in plantation agriculture may be summarized as follows: changes in livestock production, tendencies in sugar cane production and the trends in productivity and mechanization of the plantation system. Recent management decisions and their possible future impact on the industry will be discussed.

A. Changes in Livestock Production

A substantial increase in the acreage of Pangola

⁶⁵ The West Indies Sugar Company, Frome Division, Annual Report of the Cultivation Department for the Year Ending 30th September, 1966, p. 4.

pastures occurred in 1966. Eighty-five new acres were cultivated at Friendship and 70 acres were replanted at Prospect Park. Plans were made to extend each herd of breeding cows at the latter from 40 to 45 cows the following year.

Special plans were made for the improvement of pasture and the reduction of the costs of producing cattle. Machines were being used to clear land of timber and brush. Permanent fencing was to be established by the use of "quick stick," a hardy plant which grows very easily and makes excellent hedges. The supplying of fence posts is one of the costly activities in cattle rearing.

The roots of undesirable trees and bushes are to be treated with a mixture of diesel oil and Spontax which has proven effective in eliminating regrowth.

One of the most effective economy measures has been the mechanical cleaning of pasture in place of the former manual method. It costs approximately \$8.58 (Canadian) $(\underline{13..5/-})$ per acre for cleaning pasture by hand. The same job costs \$5.02 ($\underline{1..18/-}$) or a reduction cost of 41.6 per cent an acre.⁶⁶

66 Ibid., p. 2.

B. Tendencies in Sugar Cane Production

There has been a tendency for sugar production to decline since an apparent peak was reached in 1965. This paper does not predict a continuation of this trend, however, since fluctuations in production levels are characteristic of the sugar industry. The acreage in crop and the tonnage produced vary with weather, the price of sugar on the world market, and cultural practices. Adverse climatic conditions and a reduction in the application of fertilizers often result in greater decreases in output than changes in the market price since sugar cane is the best cash crop on the plains of Westmoreland.

The decreasing efficiency of the factory is another major factor which could have contributed to a reduction. A factory's efficiency is established by measuring its conversion ratio (tons of cane required to produce a ton of sugar) and other aspects of production, for example its experimental work. Frome and many other factories showed a decreasing efficiency trend from 1965 to 1967.⁶⁷

Finally, the percentage of crop in ratoon and the number of ratoon crops taken could influence the total output.

67 The All-Island Jamaica Cane Farmers' Association, Twenty-Sixth Annual Report, pp. 29-31.

The yield of many cane varieties diminishes substantially with succeeding years of ratoon.

The seemingly anomalous situation in which the total acreage of sugar cane cultivation increases annually and is accompanied by a decrease in aggregate tonnage is understandable for the above reasons. In 1964, 12,796 acres were cultivated. They increased to 12,853, 13,154, and 13,174 acres in the consecutive years from 1965 to 1967.⁶⁸ The tonnage of the Company's (factory) produced sugar and sugar cane declined yearly since 1965. (See Appendix V.)⁶⁹ There was a net decrease in the amount of sugar cane delivery by the Estate of 6.34 per cent. The sugar manufactured from its cane production fell by 13 per cent.

C. Productivity and Mechanization Trend in the Plantation System

It was shown (tendencies in sugar cane production) that there is a current trend towards a decline in sugar production by the Company. However, there is no reason for alarm since fluctuations are characteristic of the

68 Beckford, op. cit.

⁶⁹ The All-Island Jamaica Cane Farmers' Association, <u>Twenty-sixth Annual Report</u> (Tables Five to Seven used as basis of calculations by the writer.)

industry. On the other hand, livestock production is increasing.

Mechanization is also increasing on both types of estate farms and in the factory. The main objectives of this accelerated mechanization are to improve efficiency, reduce the cost of production, raise productivity and eliminate labour shortages.

Some of these aims are being achieved on the livestock and sugar cane farms because of the use of bush cutters and mechanical cane loaders. Others are around the bagasse area where new installations were established.

7. THE COMPANY'S ROLE IN SETTLEMENT

Houses are supplied to employees free of cost by the Estate. A house remains the property of the Company and once assigned it is generally occupied by the employee until he is promoted or loses his job. Promotion may enable him to obtain a larger house. A loss of job naturally results in the loss of this benefit. The quality and size of the houses vary with the rank of the employee.

They are distributed on most units comprising the Estate. Frome Central has the densest distribution and some of the largest houses. On a number of units, the residence of the overseer is constructed on a vantage point. In other areas it forms the core of the settlement on the farm. The placing of labour near the work place is a possible objective behind this distribution of houses.

Contributions to the community are made by the Company in other ways. Land is sold at nominal prices to build schools, police stations, and churches, and to establish housing schemes. The Frome Junior Secondary School and the Grange Hill School, two of the largest educational institutions in the parish, are on lands formerly owned by the Estate. The Truro Housing Scheme is one of the most recent contributions of the Estate to settlement. Approximately 200 acres were sold at a nominal price to the government for institutional purposes in the parish.

8. RECREATIONAL LAND USE

Eight playgrounds are owned and maintained by the Company in Westmoreland. They occupy an estimated 100 acres. Frome Sports Ground, the largest recreational centre in the parish, has an area of 35 acres. Each of the eight playgrounds has a pavilion.

These facilities were established with the objective of providing recreational facilities for Company employees.

The pavilions are widely used as basic schools and community centres in addition to their sports function. Cricket, football, other sports, and dances, are the chief recreational activities at these centres.

The Frome Sports Ground provides a wide variety of cultural services for the general public. Sunday schools are held there by some denominations. It is the meeting place for 4-H Clubs, Youth Clubs, and Credit Union groups. Formerly, the annual agricultural exhibitions attracted visitors from various parishes of the island. Parish eliminations for 4-H Club members are held on these grounds. However, Government schools hold sports competitions there. The main users are inter-farm competitors, employees and local residents seeking recreational facilities.⁷⁰

9. CONTRIBUTION OF THE COMPANY TO THE ECONOMIC, SOCIAL AND CULTURAL LIFE OF WESTMORELAND

It is obvious that the West Indies Sugar Company makes a very significant contribution to most aspects of life in the parish.

Economically, it is the largest employer of labour in Westmoreland. Its cultivation sector employs some

⁷⁰ Major Trevor Robinson, M.V.D., Industrial Relations Officer, July 5, 1967.

3,880 people at the peak production period. During the weeding period the number falls to about 2,000 employees.71

Approximately 1,000 workers are employed in the factory.⁷² This number is also subject to drastic reduction after the crop is harvested. The total registered labour force in 1962 was about 5,000.⁷³

Some contributions are made towards the supplementation of the income of employees. One thousand and fortytwo acres of Company property are sublet at "peppercorn rental" to employees. Rice and ground provisions are generally cultivated on these lands for subsistence purposes.⁷⁴

As has been stated in "Recreational Land Use," land is contributed for educational purposes. One Tate and Lyle Scholarship is offered every three years toward the university education of residents. Another scholarship is made available at three-year intervals to the Jamaica

71 Beckford, op. cit.

72 M. C. Frederick, op. cit.

73 The West Indies Sugar Company Ltd., <u>W.I.S. Co.</u> in Jamaica, p. 12.

 7^4 "Peppercorn rental" is a nominal fee of 13 cents (1/-) charged for renting land. The acreage rented depends on the amount of land the small farmer can clear and cultivate. This plot is often on mountainous terrain which is not measured when allotted. Less than an acre is used in most cases. See footnotell, page 69, for definition of "ground provisions."

School of Agriculture. A number of bursaries are made available periodically toward post-secondary education. Recipients are not bonded to serve the Company for any of these awards.

In addition to those mentioned, there are cash contributions to schools and churches, an apprenticeship system and management training schemes for junior executives.

Training was provided at one time for junior executives in management, labour relations and industrial operations. Six young men were trained for three years. The programme ended in 1965.

The apprenticeship system is run in accordance with the laws of the land. It provides training on contract, to tradesmen of many categories. They include welders, motor mechanics, electricians, machinists and carpenters. The training period varies from three years for welders to five years for mechanics, fitters and carpenters.

Apprentices receive wages that are fixed by law and embody increments in accordance with the contracts. The practical work is done in workshops at the factory. Some training in theory is currently given at the Montego Bay Technical Institute. Transportation to and from this centre is supplied by the Company.

Twenty-seven apprentices were enrolled in 1964. The number increased to thirty-one the following year and declined to twenty-five in 1966. No new enrollment was made in 1967. The training facilities are now utilized to the maximum; therefore a period must elapse until some trainees have completed their apprenticeship to permit new enrollment.⁷⁵

These contributions of land, recreational facilities; cash donations, scholarships and provision of employment reveal the extensive economic, social and cultural influence of the Company.

10. A SUMMARY OF THE PLANTATION SYSTEM

As the largest example of plantation agriculture in Jamaica, the Frome estate possesses characteristics which place it in a class by itself at the parish level. It is the largest single employer of labour in Westmoreland. It owns the most fertile arable lands of the parish. Its benevolent tentacles extend into most spheres of the economic, cultural and social life. The largest single capital investment in Westmoreland is centred on its property. Its

75 Major Trevor Robinson, op. cit.

accumulations of scientific knowledge, technological skills, and management are unsurpassed in the parish.

On the basis of the above observations, this chapter has made a case study of the West Indies Sugar Company, Frome, Limited as an example of plantation agriculture. Some theories and the main observable characteristics were emphasized.

The theoretical basis of the plantation system is that it is a viable commercial enterprise which depends on staple products for its income. It possesses a high degree of scientific knowledge and technological skill. A key feature is its use of hired labour under management supplied by the Company. In many cases, plantation agriculture develops into large-scale industrial enterprises.

Sugar cane is the staple crop of this discussion but livestock rearing forms part of the economy. Molasses and rum are by-products which contribute significantly to the income.

Other characteristics of the industry are price and production fluctuations. These change with world market conditions, management practices, labour relations and climatic influences.

Sugar cane and livestock culture, management policies, mechanization, the manufacture of sugar and trends are other

aspects of this discussion.

The picture presented is one of continuous effort to maximize profits by cost reduction techniques and improved efficiency. The plantation system is part of the whole community and contributes directly or indirectly to all phases of the economic, social and cultural life of the parish.
CHAPTER V

NON-PLANTATION AGRICULTURE

Non-plantation agriculture is classified in two general categories for this study. They are peasant farming and medium and large farms. The term "non-plantation" is used in a restricted sense to separate these types of private farming from that practised by the West Indies Sugar Company. In practice, medium and large farms possess many of the characteristics of the plantation system. They depend on staple products, the majority are located south of the 250-foot contour in Westmoreland, and their hired labour is supervised by the farmer, his immediate relatives, or an employee. The main difference between medium and large farms and plantation agriculture is a matter of extent. Most of the former are less than one twenty-fifth of the latter in size. They are less complex, possess fewer machines, less organized management, and employ limited scientific agricultural practices. Their hired labour lacks the supervision which is one of the principal attributes of the plantation system.

Large, medium and peasant farms were previously defined in the subsection on definitions. The first and second are linked together for discussion because their main difference is in the acreage they occupy. Medium farms are transitional types between large commercial farms and the small units of the peasants. These transitional farms tend to have more of the characteristics of the larger group than the smaller.

This chapter discusses the characteristics of largescale, medium and peasant farming. It compares the agricultural practices of large and peasant farmers.¹

A critical analysis is presented of the role of livestock and special crops such as pimento (<u>Pimenta</u> <u>officinalis</u>), rice (<u>Oryza sativa</u>), vegetables, corn (<u>Zea</u> <u>mays</u>) and ground provisions (for example, yams (<u>Dioscorea</u>), eddoes (<u>Colocasia</u>) and dasheen (<u>Colocasia antiquorum</u>) in the economy of the farmer. A discussion of industries connected with agriculture is included. Map 9 presents the chief land use characteristics of Westmoreland.

1. PEASANT FARMING

"Peasant" farms of Jamaica are universally under 25 acres in extent. In Westmoreland, as previously stated,

¹ Medium farms are excluded from the main comparison to avoid complications.



they constitute 94.1 per cent of the farm units and 28.2 per cent of the total acreage. Their average size is 1.4 acres in the five-acre category and 5.6 acres for those which are classified as 5 to less than 25 acres.² Aside from their small size they are characterized by a low level of technological inputs including fertilizers. Most of them are located "...on hillside land where the soils of moderate natural fertility have been badly eroded."3 (Map 7. No. 1-3). They are different from large farms in managerial functions and goals. Small farms are managed by the farmer and his immediate family. The peasant farmer is preoccupied with the consumption needs of his household and the need to provide a livelihood for himself and his family in subsequent years. These aims are reflected in his choice of crop and productive practices. He produces a great variety of crops. Some are sold in order to purchase clothing, meat, tools and other necessities, the bulk is used for subsistence purposes in his household. "Hand tool methods rather than mechanized cultivation are typical of the small farms."4

² See Table 2. Calculations based on the 1961-62 Agricultural census.

³ David Edwards, <u>An Economic Study of Small Farming</u> <u>in Jamaica</u> (University College of the West Indies: Institute of Social and Economic Research, 1961), p. 27.

⁴ Ibid., p. 28.

The peasant farmers of Westmoreland cultivate rice (<u>Oryza sativa</u>), corn (<u>Zea mays</u>), vegetables, sugar cane, ground provisions and various fruit trees. They also rear livestock.

A. Rice (Oryza sativa)

The type of rice (Oryza sativa) cultivated in the parish requires flooding for most of its growth cycle. Rich alluvial soils with impervious subsoils are most suitable for optimum results, generally.⁵ High tropical temperatures are a favourable factor in the production of the crop. It is found, for these reasons, in the swamp lands. The main areas are New Hope, Big Bridge, Little Bridge and Old Hope. Other small isolated acreages were observed at Truro, Locust Tree, Blackness and Townhead. Parts of the centrally located swamp-land on Map 6 (non-forested marsh and swamp vegetation) is used for rice production. The great Morass in the extreme north-west is not used for this purpose and coastal swamp-land is generally un-cultivated because of salinity.

⁵ The Economist Intelligence Unit and the Cartographic Department of the Clarendon Press, <u>The Shorter</u> <u>Economic Atlas of the World</u>, 2nd ed. (Oxford University Press), p. 14.

Surinam #2, Blue Bonnet and Buffalo are the chief variaties grown in Jamaica. The Buffalo variety is in short supply because it is one of the least resistant varieties to attacks from pests and fungi. Blue Bonnet does best on newly cultivated land and requires much fertilization for maximum yield. Surinam #2 can do well, on the other hand, on marginal land, and requires less fertilization for optimum yields. The tendency is, therefore, to emphasize the Surinam #2 variety.⁶

Rice growing has decreased and is decreasing in Westmoreland. In 1959 "over 1500 acres" were planted.7 Approximately 750 acres were cultivated in 1964⁸ and an estimated 600 acres in 1967.⁹

⁶ Interview: R. A. Sharpe, Manager, Agricultural Development Corporation Rice Plant, Spanish Town, August 4, 1967.

7 Typed manuscript, "Memorandum on Rice Industry, Westmoreland," prepared by W.A.B.S. (Westmoreland Association of Branch Society), 1959. The main rice producing area observed was a portion of the non-coastal parts of "Miscellaneous crops and vegetation" adjacent to Savanna-La-Mar (Map 9 and Map 1).

⁸ Ministry of Agriculture and Lands Extension Services, Westmoreland, <u>Annual Report 1964</u>, p. 3. Calculated from statistics of 20 bags an acre and total yield of 15,000 bags. A bag weighs about 150 pounds.

⁹ Interview: Mr. Chedisingh, Secretary, Rice Growers Association, Sav-la-Mar, June 29, 1967. The chief reasons for the decrease are the greater use of large properties for the production of the sugar cane and the rearing of cattle. Land which was formerly obtained at low rental by peasant farmers is no longer rented even in cases where very limited grazing is possible from April to December because of flooding. The Landillo and George's Plain properties consist of large acreages which could be used for rice production.

The average size of each paddy field is one-quarter to one-half an acre. A field of 1.5 acres was the largest observed. Most rice farms of New Hope, the area with the most extensive cultivation observed in the parish, are half-acre plots. (See Appendix X for location of New Hope, Landillo and George's Plain).

Most farms at New Hope were tilled by hired crawler tractors. In the other areas, the majority were manually tilled. Their sizes were generally smaller than at New Hope. At Truro and the other areas visited, the acreage varied from 0.1 to 0.25 acre.

Weeding and the cutting of grass and planting are done manually on all rice farms. The machete, hand fork and hoe are used to prepare plots which are not mechanically tilled. Planting is done with a pointed stick, hands and toes. Noxious weeds are uprooted by hand or cut out at

the roots with machetes and sharp knives.

Harvesting is done manually. A curved sickle is used for this purpose. Flailing with sticks or trampling by animals is the method used to remove the grains from the stalks. A specially prepared bamboo container is used to scoop the grains for winnowing.

It can be seen from the above that rice production is a labour intensive agricultural enterprise. The rice industry, if expanded complementarily with other programmes to be discussed, offers much potential to alleviate the unemployment problem and improve the economy of the island.

An estimated 3,000 acres could be made available for rice cultivation in the parish. This would supply employment to between 7,000 and 8,000 people, including the farmers.¹⁰ This potential is probably reduced by about 500 acres and 1,000 workers since the report was compiled in 1959. The majority of these 3,000 acres are swamp land used as uncultivated pastures from May to November, that is, during the wetter part of the year.

Imports of rice by Jamaica increased annually from 41.9 million pounds (weight) in 1962 to 73.9 million pounds

10 "Memorandum on Rice Industry, Westmoreland."

in 1965. An increase of 22.0 per cent over the previous year. Yet milled rice produced locally fell by 100 tons or 4.4 per cent in 1965. An arrangement was concluded in March, 1965 for Jamaica's importation of rice from British Guiana to increase substantially for one year.¹¹ This situation should not be continued by a country whose adverse balance of payments rose to \$90.55 million (±34.3 million) in 1966.¹² The available resources need to be utilized more effectively. Suggestions for more efficient use of the swamps of Westmoreland are reserved for "Problems and Solutions." If they are implemented for most swamps of the island, the trade deficit could be reduced, the economy would be diversified and a considerable number of unemployed could obtain gainful employment.

Proper water control needs to be established in some of the areas which are being used for rice production. In 1963, for example, the crop production was reduced by 30 per cent because nurseries were adversely affected by flooding.13

11 Economic Survey Jamaica 1964 and 1965, p. 75 and p. 68 respectively.

12 Ibid., 1966, p. 23.

13 Ministry of Agriculture and Lands, Western Division, Annual Report for Year Ending December 1963, p. 6.

B. Ground Provisions

Mixed cropping is another characteristic of peasant farming. Yams (<u>Dioscorea spp</u>.) are most commonly found, but "cocoes," another tuber, are often mixed in the same field. Other non-tuberous crops are also frequently planted in the same plot. Bananas (<u>Musa sapientum</u>), plantains (<u>Musa paradisiaca</u>), pumpkin (<u>Curcurbita pepo</u>), corn (<u>Zea mays</u>) and a few roots of edible sugar cane. These small plots are classified as horticulture. On large farms they are generally cultivated for subsistence purposes. They are planted for commercial and subsistence use on peasant farms. (Map 9.)

The more progressive peasant farmers practise some amount of "pure" cropping. That is, a separate plot for each crop. Different varieties of yams are sometimes cultivated separately. Negro, Yellow, Renta and Saint Vincent are the chief types of yams cultivated. These are starchy tubers which are chiefly cultivated in the hilly to mountainous areas. They are planted in mounds and provided with bamboo (<u>Bambusa vulgaris</u>) poles for support. Yams have twining stems which add a picturesque appearance to the cultural landscape. (See Appendix VI, No. 4.)

As is the case with other crops, they need to be fertilized but very few peasant farmers apply fertilizers. Those who apply commercial fertilizers often do so without getting the soil tested and the amount added is frequently insufficient.

Eddoes (<u>Colocasia</u>) and dasheen (<u>Colocasia antiquorum</u>) are planted in vales and by springs at the base of hills. The former are less edible and are better used as feed for hogs. Dasheens are delicious starchy food and are more widely distributed. They are more adaptable to swamps and give the farmer the opportunity of utilizing low-lying areas on his plot which would otherwise be uncultivated under present conditions of drainage.

On the plains, ground provisions have a lower occurrence. They are found chiefly on subsistence farms of employees of the West Indies Sugar Company (except in the Great Morass). These are mixed cultivations, generally.

Ground provisions are grown primarily north, east and west of the 250-foot contour. The slopes they occupy are steep and frequently eroded. Mechanical tillage is often impossible on these slopes. The lands of these peasant farmers are badly fragmented.

More than a third of Jamaican agricultural workers are under-employed because small farmers waste much time

walking between plots which may be miles apart. The small units cannot provide full employment for the farmer and his family and this is another reason for the under-employment. Peasant farmers work less than five days each week and in many cases less than a full day's productive work is done each day when they visit their farms. The mal-distribution of land is a major reason for the high degree of inequality of rural incomes, and the frustrations and inefficiency of small farmers.¹⁴

C. Banana (Musa sapientum)

As a rule, a few roots of bananas are scattered on most farms. The chief areas of extensive production are Midgham Mountain, Seaford Town, Bethel Town area, Bleauwarie and Moreland Hill. (See Map 4.) Bananas require a deep loam for optimum production. Alluvial, shale and red limestone soils are the most suitable varieties in Jamaica for the production of bananas.¹⁵ In Westmoreland, some of the most successful cultivations are in the shale area of Seaford Town. (Appendix VI, No. 5. Compare "banana and

¹⁴ Journal of Jamaica Agricultural Society, <u>The Farmer</u>, Vol. LXXII, Nos. 1-2, January to February, 1967, pp. 8-11.

¹⁵ Jamaica Agricultural Society, <u>Farmers' Guide</u>, p. 332.

horticulture" of Map 9 with "soils on uplands of shales conglomerates and igneous rocks" on Map 5.)

Banana cultivations occupy about fourth position in the crop acreage of the parish. (See Appendix VII.)¹⁶ The crop is cultivated in Westmoreland mainly on medium and small farms. This is primarily because the banana cultivations of Westmoreland are located on the hills where mechanization is less applicable. Another reason is the limited supply of very suitable soil for banana production.

Bananas require good management practices in order to produce fruit of superior quality for the export market. In order to encourage production and satisfy export demands, the Banana Board and its agency, the All-Island Banana Growers Association, give much assistance to growers. The functions of these bodies are considered under "The Role of Government in Agriculture." At present only cultural practices, pests and diseases are discussed in the remaining paragraphs.

Gros Michel and Lacatan are the chief species culti-

¹⁶ Ministry of Agriculture and Lands, Extension Service, Westmoreland, <u>Annual Report, 1966-1967</u>, p. 3. (Ground provisions as a group would be second but they were excluded from this Report. Probably they were excluded because of the problem of accounting for some farms in inaccessible areas.)

vated locally but twenty-seven edible varieties, excluding plantains, are known in Jamaica. The Gros Michel is preferred when ripe to the Lacatan. However, Lacatans are more widely distributed because Panama disease (<u>Fusorium</u> <u>oxysporium cubense</u>) destroyed the Gros Michel plantations. Lacatans are immune to this disease. Both types are very susceptible to Leaf Spot (<u>Musicola mycosphgerella</u>), a fungus which attacks the leaves.

Pests such as the banana weevil borer (<u>Cosmopolites</u> <u>sordidus</u>), and the burrowing nematode (<u>Radopholus similis</u>) destroy the crops. Rigid sanitation, chemical mixtures and oil sprays are the chief methods of control used. Namatode-free suckers are planted to control the latter.

Grasses and weeds compete for moisture and nitrogen which are important requirements of banana plants. Farmers tend to use the machete to clear the banana fields of weeds and grasses. Observations have shown that weeding with the machete damages young shoots (suckers) and results in reduction of the yield. The application of herbicides is recommended in place of the hoe and machete.¹⁷ Weeding with hoes and machetes remains the common method among peasant farmers. The cost of chemical herbicides and the care required in the application are limiting factors to their use.

17 The Jamaica Agricultural Society, <u>The Farmers</u>' Guide, p. 349.

D. <u>Corn (Zea mays)</u>

Climatic conditions are not as suitable for corn in Westmoreland as is desirable. It is common knowledge that the mid-latitudes, especially the "corn belt" of the United States, provide the best climatic and physical conditions for the commercial production of this crop.

Because of these limitations, yields are generally low--12 to 14 bushels of shelled grain per acre. Twenty bushels per acre is considered a fair yield.¹⁸

In 1967, the farmers of the parish had a good year with this crop. The yield was expected to be better than average. It is difficult to give accurate yields of maize in Jamaica since most farmers reap some corn green for roasting.

The peasant areas of the parish are generally the chief areas of production of corn. Only a few small plots for subsistence use are scattered on the plains. They range in size from about 0.05 to 0.25 of an acre. One large farmer was interviewed who cultivated 15 acres of maize in order to use the stalks for fodder.¹⁹ The crop

18 <u>Ibid</u>., p. 507. A bushel weighs approximately 64 pounds.

19 Landed Proprietor, Sweet River Property, Petersfield. February 8, 1968. (Incidentally, this farmer probably obtained his concept of corn for fodder from the United States, the country of which he is a citizen.) became so promising that he changed his mind and reaped the ears.

Indian corn is generally a subsistence crop in Westmoreland. Some peasant farmers use a small proportion of the crop to feed their poultry.

E. New Sugar

A wet and sticky type of sugar is made by a few cane farmers in the hilly areas. The product is known locally as "wet sugar" and is named new sugar in the Minister of Agriculture and Lands records. The cane is ground by a mill turned by animals and the juice is boiled in a copper bowl cemented to an oven. This structure, excluding the mill, is generally constructed under a thatched wooden frame called the "boiling house."

Some of the worst and most expensive cultural practices in the production of sugar cane are to be found in areas where these mills are located. Caledonia and Darliston are two districts of special interest to this study. Moreland Hill presents some exceptions.

The districts consist of mountainous terrain where steep slopes and thin soils are major limitations. Darliston is partly a plateau. However, the best lands are occupied by settlement and a large cattle farm.

It is uneconomic to transport cane to Frome from these districts. The factory is about thirteen miles from most of the farms, and approximately four of these miles are down steep hills via circuitous paved roads. The cane from Darliston and Caledonia has to be carried by men and animals to points from which tractor-drawn conveyances or trucks can transport them to the factory.

Manual tillage is more expensive than mechanical to the farmer. It costs \$52.80 (E20) to \$66 (E25) an acre for tilling manually and from \$23.76 (E9) to \$26.40 (E10) for tillage by machine. The Agricultural Development Corporation charged from \$13.20 (E5) to \$19.80 (E7..10/-) for each acre tilled.¹⁹ Rates vary within these ranges, with the condition and location of the land and the type of tillage. It is the policy of the Agricultural Development Corporation to supply tillage to small farmers at rates 20 per cent less than the current charges of private tractor owners.²⁰

19 Established from questionnaires.

20 Interview: A. G. Robinson, Agricultural Development Corporation, Farm Machinery Pools Supervisor, Spanish Town, August 4, 1967. The cost of tillage may appear high but this is partly the result of importation of machinery from countries where labour costs are high and the additional costs attributable to insurance, transportation and the profit of middle-man which the consumer has to pay. Moreland Hill has some areas where mechanical tillage can be practised. Its cane is superior in quality to that of Caledonia and Darliston. Yields are better, and superior varieties are cultivated. Some steep slopes are still inaccessible to tractors and the cane must be transported to points from which it can be transported by vehicle, as in the former example. Manual tillage is characteristic of Moreland Hill and the other areas. Although Moreland Hill is only about five miles from the weighing station of Masemuir, poor gravel roads and steep slopes cause truck and wheeled tractor owners to be hesitant to transport the cane. Each year some cut cane becomes stale and is wasted for this reason.

In the Caledonia and Darliston areas the peasant farmers tend to practise "ratoon" for too many years. They sjpply (plant new seeds between rows of old roots) the canes periodically with inferior varieties. Fertilization is seldom practised. Generally, both areas are unsuitable for sugar cane production. New sugar production is an unsophisticated attempt by peasant farmers to make sugar in areas where transportation, physical factors and cultural practices cause it to be uneconomic to send the cane to the factory.

One is led to wonder how it is possible for the small

farmer with the least capital to pay the highest cost for tillage. This is because only a few employ hired labour and the employee is used to till a small fraction of an acre. Others do the job by themselves or with the aid of male members of the family. Another group exchange work days with relatives, neighbours and friends. Work gangs do the tillage on such occasions. The procedure is interesting but frustrating to the farmer, who is barely able to earm a subsistence income after much expenditure of energy.

F. Permanent Tree Crops

The dispersal of permanent trees which yield commercial and subsistence products is characteristic of most farms in Westmoreland. This statement does not ignore the presence of groves and orchards. These, however, are more frequently distributed on medium and large farms, hence are considered in that section. Neither grove nor orchard was observed on a peasant farm in the parish. There were examples of "food forests" which were previously defined. In these "food forests" were clusters of varieties of trees. For example breadfruit (<u>Artocarpus incisa</u>), citrus (<u>Citrus</u> <u>spp.</u>), ackee (<u>Blighia sapida</u>), jack fruit (<u>Artocarpus</u> <u>integrifolia</u>), star apple (<u>Chrysophyllum cainito</u>), custard apple (<u>Annona recticutata</u>), and mango (<u>Mangifera indica</u>). Other trees which are not classified as "food forests" are sometimes found in these clusters. The most common are cocoa (<u>Cacao</u>), pimento (<u>Pimenta officinalis</u>) and coffee (<u>Caffe, Kappe, Kopai</u>).²¹

The majority of these crops can grow wild in Jamaica. When they are not cultivated, they grow in random fashion and serve as subsistence crops. Ackee, breadfruit, certain species of mangoes and star apples are allowed to waste on large farms or reaped by employees. They sometimes provide an easy source of cash crops to peasants who sell them in local markets.

Pimento, cocoa and coffee are treated more seriously by most farmers. Only one large farmer in Westmoreland is known to cultivate pimento. For this reason and because the greatest acreage is on large and medium farms, the discussion is presented under large and medium farms. Generally, the peasant farmer only reaps the berries and the leaves. Their pimento plants propagate, as on other farms, from seeds scattered by birds.

A fair harvest is obtained once in five or seven years because the branches are broken incorrectly and the

²¹ Edwards, <u>op</u>. <u>cit</u>., Appendix F (source of botanical names).

trees receive minimum care. In most cases, peasant farmers are extractors of the pimento resources. They reap without sowing or cultivating the crop. Most pimento farmers have an extractive approach to this product.

Coffee and cocoa are given more care. This does not necessarily imply a scientific agricultural approach. On small farms, they might or might not be planted according to the Jamaica Agricultural Society specifications. One or two acres may consist primarily of cocoa, coffee or Sections of the same farm are often shaded by both. canopies of "food forests." Cleared areas may also be reserved for ground provisions. Coffee and cocoa are seldom fertilized but they are pruned and cleared of weeds annually by peasant farmers. These are commercial crops which are important sources of cash income in some hilly The farm units are small. In many cases, the cocoa areas. and coffee farms are part of the plots where homesteads are located.

G. Vegetables

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Cabbages, pumpkins, carrots and melons are the chief vegetables produced, in that order of importance. Others, such as cauliflower and tomatoes are cultivated in smaller

quantities.

In 1962 it was stated that over 65 per cent of the vegetables grown in Westmoreland were cultivated in the Springfield-Sheffield district.²² The Great Morass is located in this area and continues to be the main vegetable-producing part of the parish. Cabbage was the chief vegetable in 1962. It retains its primacy in 1968.

Small farmers are the chief cultivators of vegetables in the area. Most of them cultivate an acre of land annually. The Great Morass contains some of the most fertile soils in the parish. Their dark colour suggests a high concentration of humus. (See Appendix VI, No. 6.)

The small farmers rent the land from four large property owners whose lands occupy most of the area. Annual flooding continues to cause these farmers to anticipate the rainy season with apprehension and anxiety.

H. Livestock on Non-plantation Farms

Mixed farming is characteristic of most of the farms studied. In this paper, mixed farming is taken to mean that livestock and crops are produced on the same farm. The

22 Ministry of Agriculture...<u>Annual Report, 1962</u>, p. 6.

chief livestock produced in order of numerical importance by the small farmers interviewed were poultry, hogs, goats and cattle.²³

A somewhat reverse order was noticeable on medium and large farms. Cattle were commercially reared on an extensive scale. Poultry were reared chiefly for subsistence by the majority of farmers. Pigs have not yet regained popularity among the larger farmers. Draught animals are fairly common on large farms where they are used by herdsmen to transport goods, equipment and penkeepers.

(1) Cattle Rearing

Cattle are reared in many cases for the dual purposes of milk and beef production. This is an uneconomic method of producing milk and beef for the following reasons: These herds often have a high percentage of "creole" cattle which yield little milk and produce low conversion ratios of feed to beef. In addition, farmers seldom have the facilities to care for more than one type of livestock,

23 Draught animals are excluded from this list because of the different purposes for which they are reared. The donkey is the most popular. Mules are seldom seen. No horses were seen on any small farm.

hence when both beef and dairy rearing are attempted, cultural practices tend to deteriorate and efficiency to lower.

Some of the larger farmers are fairly efficient producers. A few specialize in dairying but many are producing beef cattle.

The beef cattle varieties reared by the West Indies Sugar Company are to be found on these farms, with one addition, the Jamaica Red Poll. The Jamaica Red Poll is a derivative from Red Poll cattle and Zebu or Brahman. Bulls weigh about 1,500 to 1,800 pounds, and cows weigh 1,200 pounds. Most of the cattle exported are Jamaica Red Polls.²⁴

The Government is making efforts to upgrade the livestock breeds but it is apparent that costs are prohibitive factors to the peasant farmer. The majority have animals of numerous mixed strains and a high percentage of "creole" cattle. Some small farmers are still paying two guineas ($\pm 2..2/-$ or \$5.54) for each calf from pedigree sires owned by large farmers. Cattle are not common on peasant farms. They lack the required space for fodder production and equipment. Generally the number of live-

24 Jamaica Agricultural Society, The Farmers' Guide, p. 657. stock reared by the small farmer is too few to be economical.

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(2) Dairying

Holstein, Jersey and Jamaica Hope are the chief breeds of dairy cattle in Westmoreland. These were seen only on medium and large farms.

The demand for milk is increasing in Savanna-la-Mar. Its government institutions, supermarkets and restaurants need more of this product. Seven or eight dairy farmers from the suburbs of the town who formerly supplied the capital with milk changed to sugar cane production about six years ago. Partly because of the current (1968) low sugar price and the increased demand for milk, they are contemplating a return to dairying.

One large farmer, whose parents continued dairying near Savanna-la-Mar from the writer's childhood, is establishing a milking machine and dairy shed at a capital investment of \$18,480 (£7,000).²⁵ All the dairy farms which were observed practised manual milking. Generally, they appeared to be fairly successful.

25 Interview: Edward Norton, Farmer, Farm Pen, Savanna-la-Mar, February 7, 1968.

(3) Hogs

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Large Whites, a type of hog with good carcass characteristics, are becoming popular in Westmoreland. The hog industry became a major enterprise in 1962 because of the introduction of Large Whites. A survey estimated 1,990 fatteners and breeding stock (Large Whites) in the parish at that time.²⁶ The industry developed marketing problems soon afterwards. Many farmers interviewed in the summer of 1967 had not continued hog raising after their loss. Four of those interviewed were large farmers who lost about \$2,640 (£1,000) each on their investments. Their large piggeries are empty and depreciating.

Lydford Enterprises Limited, the company which initially supplied feed and purchased the pigs, is accused of arbitrary grading practices which caused the failure of many farmers to reach the required Grade A standard. Failures resulted in loss of contracts and confidence in the industry.²⁷ Some farmers are still hesitant to re-enter an industry in which they experienced losses although the

²⁶ Ministry of Agriculture and Lands Extension Service, Western Division, <u>Annual Report Year Ending December 1962</u>, p. 8.

²⁷ Ibid., 1963, p. 10.

new company, Western Meat Packers Limited, is gaining acceptance among hog farmers.

Besides large Whites, other mixed varieties are fairly common but they are reared on a small scale. Most small farmers have one or two pigs. For example, of 32 farmers interviewed, 27 had an average of 1.4 pigs. These were mixed breeds. One farmer had 300 Large Whites. (See Table 12.).

(4) Poultry

It was estimated that there were 3,000 hogs, 5,300 hens (layers) and 14,000 goats in Westmoreland in 1965.²⁸ Poultry, our immediate concern, is distributed among many farms at a low unit rate of distribution. This is particularly clear to the writer who visited a farm in the suburbs of Portage la Prairie with over 8,000 birds. It emphasizes the small scale of the enterprise in Westmoreland. (See Table 14.)

Poultry are produced mainly for eggs for subsistence purposes. A few large farmers produce on a commercial scale.

28 Ministry of Agriculture and Lands Extension Service, Programme of the Agricultural Extension Service 1965-1970 and Targets 1965-1966, p. 30 (unpublished report).

TABLE 12

SMALL LIVESTOCK (POULTRY, HOGS, GOATS) ON 69 FARMS²⁹

1. Poultry

Items	Number of Poultry						
	1-5	6-10	11-20	21-30	31-40	41 & over	Total
No. of Farm Units Aggregate Poultry Average	22 68 3.1	17 121 7.1	24 462 19.3	3 76 25•3	- 3 111 37	1 1,000 1,000	69 838 12.1
Percentage	8.1	14.4	55.2	9.1	13.2	54.4	100%
		2. Hog	<u>gs</u>				
Items	Number of Hogs						
	1-5	6-10	11-20	21-30	31-40	41 & over	Total
No. of Farm Units Aggregate Hogs Average	27 39 1.4	1 6 6	1 12 12	1 21 21	1 40 40	1 300 300	31 118 3.8
Percentage	33.1	5.1	10.1	17.8	33.9	71.8	100%
		<u>3. Goa</u>	ts				
Items	Number of Goats						
	1-5	****	6-10		11-20	****	Total
No. of Farm Units Aggregate Goats Average	21 36 1.7		2 16 8		2 28 14		25 80 3.2
Percentage in Category	45		20	<u></u>	35		100%
29 Establish	ned fro	om ques	tionnair	es. The	number	s for	

29 Established from questionnaires. The numbers for category "41 and over" are excluded from the total to prevent a distortion of the general picture. One Chinese farmer owned 54.4 and 71.8 per cent of the poultry and hogs respectively on the farms interviewed. This was an exceptional case that merited individual treatment. One farmer had 1,000 Leghorns. The majority of the others reared mixtures of Plymouth Rock, Leghorn, Rhode Island Red and other breeds.

<u>(5) Goats</u>

All of the farmers interviewed were unable to state the type of goats they reared. Goats are reared for the consumption of the goat's flesh. The demand for goat's flesh is in excess of the diminishing supply. Formerly, the Government of Jamaica did not consider goat rearing an economic venture and therefore made no provision for the development of this activity.³⁰ The approach of government to this activity is probably changing. An estimate for proposed increase of goats suggests that they are being considered.

Most goats of Westmoreland are the general-purpose type which result from the crossing of different breeds. They receive a minimum amount of care. Generally, they are tied to a tree in a cleared spot and moved daily.

Some breeds of goats are Saanen, Toggenburg, British Alpine and Anglo-Nubian.

30 Jamaica Agricultural Society, The Farmer's Guide, p. 731.

Goats are very serious agents of erosion when they feed on the vegetation on slopes. They cut grass and shrubs close to the ground. When they are tied to one spot for a day or two, each area becomes bare. This encourages rapid run-off which removes the surface layers of soil.

Peasant farmers are the chief goat rearers in the parish. The average distribution of 1.7 goats among 21 farm units supports this observation. These peasants live chiefly on the hills. Their rearing of goats is a contributing factor to the erosion problem on these uplands.

2. LARGE AND MEDIUM FARMS

The differences between these two types of farms are not many. Large arable farms are generally located on the plains. Some arable medium farms, on the other hand, are found on the hills and on the plains. A number of large cattle farms are to be seen on the Darliston plateau and the undulating to hilly eastern and southeastern portions of the parish. However, the majority of the large livestock and cultivated farms are located on the plains south of the 250foot contour.

Size, as has been shown, is another difference between both types of farms. The extent of their productivity is the third factor that was considered. Their cultivation

practices are other factors of importance.

Medium farms have characteristics of both their large and small neighbours. Some medium farms, like those of the peasants, lack machinery. Others, especially the largest of the medium category, are adequately supplied with machines. Those without machinery are able to obtain them on a rental from private owners and the Farm Machinery Pools. They are better able to obtain tillage from these sources than the peasants because the units of the medium farmers are larger. They are more frequently located on terrain more suitable for mechanical tillage. In addition, their contacts and access to capital are better.

Medium and large farmers cultivate by using similar methods, in some cases, to the plantation system. This is particularly true in their care of the sugar cane. Their mechanical tillage and haulage (excluding the use of private locomotives), fertilization, manual weeding and the use of herbicides, and hiring of employees are examples of similarities. Their general ownership of farm machinery is satisfactory.

However, there are significant differences between large and medium farms (as a group) and the plantation system. It is the object of the following discussion to emphasize these differences.

Large and medium farms exhibit a greater diversifica-

tion of commercial crops than the plantation system in Westmoreland. Pimento (<u>Pimenta officinalis</u>), coconuts, sugar cane, citrus fruits and bananas are widely distributed as commercial crops of the former group. The sugar cane is the only cash crop of the latter.

Three of these crops, citrus fruits, coconuts and pimento, have been deferred until this section. They are now given full coverage as examples of the cultivation practices on some medium and large farms.

A. <u>Pimento (Pimenta officinalis)</u>

Pimento, or allspice, is indigenous to the West Indies and certain parts of Central America. It occurs chiefly in Jamaica and to a lesser extent in Cuba.31

The pimento plant "...thrives mainly on the 'Terra Rossa' or Red Limestone soils and on the 'Rendzina' or Black Marl soils." It requires good drainage which is generally found on the course and porous red limestone soils. The crop thrives under rainfall conditions of 40 to 100 inches annually but 60 inches yearly provide normal conditions.³²

31 J. F. Ward, <u>Pimento</u> (Kingston, Jamaica: The Government Printer, 1961), p. 3.

32 Ibid., pp. 6-7.

When these physical requirements are met, the seeds are frequently propagated by birds.

The limestone hills of Westmoreland meet the requirements in varying degrees. Consequently, pimento grows on the following large properties, some of which are completely or partly located on limestone hills: Mount Edgecombe, Whitehall, Ackendown and Bluefields. Other important pimento-growing areas are Cave Mountain, Beeston Spring, Darliston, and Clifton, a medium size property.

Pimento plants are not generally cultivated in Westmoreland, for a number of reasons. This is partly the result of lack of knowledge about the plant, the long period of waiting required before a harvest is obtained, the problems associated with pimento farms, and a common misconception that the seeds would only germinate after passing through the intestines of a bird.

It is still necessary for farmers to rely chiefly on plants propagated from seeds, and many of the seedlings develop into non-bearing trees. Other methods such as stem-cutting and budding, and grafting have been attempted with limited success in the past but grafting is being conducted successfully today. This will be further discussed under "Research." The method of propagation by seed seems to be painstaking and delicate. The farmer is

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advised to remove the pericarp (fleshy outer covering) by washing. Subsequently, the seeds must be dried in the shade so that the powers of germination may not be reduced. This reduction occurs when drying takes place in the sun.³³

When it is realized that after much care, a significant proportion of the trees become barren and the farmers have to wait three to five years before they reap their first harvest, the reasons for the extractive approach become evident. "It is only in the best cropping areas that as much as 50% of the trees can be expected to crop in any one year."³⁴

The precise soil requirements of the pimento plant are little known. From its location on limestone soils it is assumed that it demands lime and there are some indications that it requires soils which contain much potash. It is recommended that attempts be made to correct the known deficiencies of particular soil types. This should be done by careful consideration of the fertilizer recommendations for orchard crops for those types of soil.³⁵

 3^4 <u>Ibid.</u>, p. 15. Reference is made to all the trees on a farm since it is very difficult to identify the sex of pimento plants before they yield berries. Some barren trees even produce malformed berries.

35 <u>Ibid</u>., p. 11.

³³ Ibid., pp. 7-8.

The majority of the large and medium farmers prune the pimento trees and clear the roots of weeds. They are concerned with the method of breaking the branches with the berries at harvest. Many explained that improper removal of branches increases the number of years without harvest as it takes longer for dense foliage to grow. The one farmer who cultivates pimento, fertilizes his farm with potash and transplants potted plants. He obtains the best results of those interviewed. A high percentage of his trees produce berries annually. The trees were laden with berries at the time of interview. A record harvest was anticipated.³⁶

A number of diseases and pests attack the pimento plant. The worst is the Pimento Leaf Rust (<u>Puccinia Psidii</u>). It attacks expanding foliage and succulent young stems and causes great loss to the farmer. Pimento rusts are causing a decrease in the production of this crop in the parish.³⁷ Attempts are made to control the rust by the application of fungicides.

Other pests of the plant are the pimento borer (Crytomeys pilicornis), termites, Pimento White Fly, and

³⁶ Interview: Andrew Augilar, Ackendown, August, 1967.
³⁷ Ministry of Agriculture and Lands Extension
Service, Westmoreland, Annual Report 1966-67, p. 3.

scale insects. Termites are easily eradicated by applying white arsenic to their nests. Pests have little effect when pimento trees are well cared for. Recently the government has established a Pimento Research Station which will be supplying farmers with seedlings. It is experimenting to improve the varieties and introduce proper control of pests and diseases.³⁸ 5,260 acres of pimento were reported in Westmoreland in 1967. This represented an increase of 130 acres over the previous year. A decline of 1 hundredweight was recorded although the acreage increased. (See Appendix VII.)

B. <u>Citrus</u>

As can be seen from the 270 acres in 1967, citrus fruits are among the less important crops of the parish. They are, however, produced in commercial quantities on a number of large and medium farms. The main groves observed were at Acton, George's Plain, Farm Pen, Bethel Town, Seaford Town and Grange Hill.

Oranges - Valencia and Hamlin, for example - are chiefly grown but grapefruit is also popular. The March

³⁸ Attempts to interview Dr. Chapman, the supervisor of the project, were unsuccessful. He had left the island on vacation.
Seedless grapefruit is grown to satisfy foreign market demands. Limes are gaining some importance on a few large farms. Government-supplied seedlings are being planted.

Citrus trees receive much care from the farmers interviewed. Although the general complaint is that the price is low, the trees are carefully fertilized and freed of harmful pests and diseases. When orchards are part of the homestead, they are cared for because of their ornamental as well as their commercial value.

C. Coconuts

Coconut palms are less found in groves than the total of 300 acres for the parish would tend to have the reader believe. They are widely and unsystematically scattered on most farms. This is particularly true of the taller trees and more common varieties. A few large farmers are attempting to establish well laid out dwarf varieties in rows.

Lethal Yellowing, a disease which kills "Jamaica Tall" coconuts, is the major problem on the coconut farms of the parish. Not much is known about the disease in Jamaica but the Coconut Industry Board is promoting and encouraging the planting of Malayan Dwarfs, a variety

resistant to Lethal Yellowing.39

D. Interdependence of Peasants and Other Farmers

In numerous cases, peasant farmers provide the labour supply for medium and large property owners. The peasants are compensated for their services by their wages and other fringe benefits. A "Peppercorn" (nominal) rental of 13%(1/-) is frequently charged by the property owners for the use of small units. The less arable hilly areas and swamps are often reserved for this purpose.

Livestock producers sometimes permit grass land to be used free of charge, with the conditional agreement that grasses are planted after the small farmer has reaped a short term crop. Grass seeds are supplied to the peasant for this purpose.

Squatting is not disallowed on reserved sections of some large properties because the squatter supplements the labour force.

Other incentives are provided for some employees. Permanently employed penkeepers share in the profits of

³⁹ R. W. Smith, "Malayan Dwarfs as Varietal Answer to 'Jamaica Talls,'" <u>The Farmers' Weekly</u> (Saturday, August 5, 1967), p. xvi. some farms for efficient service. They receive calves, in addition to their wages, for rearing cattle on partownership. Others are permitted to pasture their livestock on uncultivated pastures (commons) of large farms free of charge. Some pay for calves from pedigree sires on the properties.

A few large farms provide residences for their overseers. These farmers are interdependent in many ways.

3. INDUSTRIES CONNECTED WITH AGRICULTURE

It is evident from the previous discussions that the Frome Factory is the largest industry connected with agriculture in Jamaica. Almost 100 per cent of Westmoreland's sugar is ground and manufactured by this factory. The only known exceptions are minor mills which produce an insignificant proportion of new sugar from cane in the hills. Otherwise, all farmers' cane is sold to Frome.

Other industries related to agriculture are the pimento leaf-oil industry and meat packing. Westmoreland contains twenty-eight agricultural establishments, which employ ten or more persons. There are fourteen manufacturing and two mining and quarrying industries within this

category.40

A. <u>Pimento Leaf Oil</u> Industry

Pimento has many uses. It is used primarily for the curing of meats, in the preparation of mixed pickles, the manufacture of sausages and in several medicinal preparations. Some examples of medicinal preparations are "Oil of Pimento," and "Spirits of Pimento." A local drink, "Pimento Dram," is made from the ripe berries with the addition of rum. Pimento oil is manufactured from the leaves. This oil is used "...for the isolation of Eugenol and subsequent production of synthetic vanillin."⁴¹

Some pimento leaf-oil factories employ more than ten people. Some four factories manufacture Pimento Leaf-Oil in Westmoreland. The economic limit for the transportation of pimento leaves to small factories is about ten miles. It costs from 79% (6/-) to 92% (7/-) to transport each 100 pounds of pimento leaves to the factory.

June to December is the peak production period, when the majority of the labour force is employed. The

40 Submitted on request by Mrs. F. Sylvester for Director of Statistics, June 8, 1967.

41 Ward, op. cit., pp. 16-18.

factory observed is owned by one proprietor. Its production capacity is 900 to 1,125 gallons per season. About 1.5 million pounds of pimento leaves are required to produce that amount of oil.

The manufacturing processes include steaming, evaporation and distillation.⁴²

B. Meat Packing Industry

Western Meat Packers Limited, the only meat packing plant in Westmoreland, is located at Savanna-la-Mar. The factory is located on approximately five acres of flat terrain on the main road from Kingston to the parish capital. This plant has a processing capacity of 500 hogs weekly.⁴³ Hogs are also purchased from neighbouring parishes such as Saint James, Hanover, Trelawny and Saint Elizabeth. Still, the plant is operating at less than onehalf of its capacity. Each week only 150 to 200 hogs are slaughtered.

A secondary activity is the slaughtering of 24 to 28

42 Interview: Pimento Leaf-Oil Manufacturer, Cave, February 5, 1968.

43 Ministry of Agriculture and Lands, Western Division, <u>Annual Report for Year Ending December 1963</u>, p. 4.

beef cattle for the Tropical Plaza supermarket in Kingston, twice weekly.

The chief products are sausages, ham and bacon. These products are supplied on contract to Grace Frankfurters, Limited, Bryden and Evelyn, Limited, J. H. G. Mapp Successors, Limited, and H. M. Brandon, Limited. These are Kingston buyers. About 80 persons are employed.⁴⁴

The presence of this factory in Westmoreland provides a stimulus to the hog industry and a market easily accessible to the majority of hog farmers. It offers substantial potential for the majority of small farmers because hogrearing does not require much land space. It uses land intensively and could be an important source of much needed protein for the country. In addition, it can divert money used for imports of pork and pork products into the pockets of Jamaican farmers. Three-quarters of a million pounds (\$2,146,000) were spent for the importation of pork and pork products in 1964.⁴⁵

Major limitations of the industry are the high capital cost of piggeries, cost of recommended breeding

44 Manager of this plant was suspicious and uncooperative. It was, therefore, necessary to obtain most of the above information from other sources whose employment must be protected by secrecy.

⁴⁵ Journal of the Jamaica Agricultural Society, The Farmer, Vol. LXXII, Nos. 3-4, March-April 1967, p. 85.

stock such as Large Whites, and costs for concentrates and grain-based meals. Government subsidies towards building construction reduce the cost of buildings to some farmers. Experiments at the Animal Production Research Centre at Bodles, Jamaica, established that feeding with cooked or uncooked bananas reduces cost without adversely affecting the rate of growth of pigs.⁴⁶ This discovery offers much opportunity to farmers in the banana-producing areas. Bananas are often produced in surplus in these areas because many stems fail to reach the grading requirements of the export market. These could be efficiently converted to pork. It is advisable that experiments be conducted with other crops, such as eddoes (Colocasia), mangoes and breadfruit (Artocarpus). Mangoes and breadfruit waste in large quantities annually.47 Eddoes are not very palatable for human beings. However, many areas on the plains (of Westmoreland, for example) are suitable for their cultivation in extensive quantities. If these products can be fed uncooked without reducing rates of growth, they could be valuable supplementary feeds.

46 Ibid., p. 85.

⁴⁷ The evidence did not suggest that any experiments were conducted with eddoes, mangoes and breadfruit, of which large quantities go to waste yearly.

4. A COMPARISON OF LARGE AND PEASANT FARMS

This subdivision compares large and peasant privately-owned farms. It is partly intended as a summary of Chapter Five. Similarities and differences between the two types of farms are emphasized. The main elements of comparison are their aims, management, technology, education, care of crops, animal husbandry, labour supply, land tenure, value of land, and yield.

Because of the high status of owners of large private farms, they are more concerned with the production of a small number of crops for export and with large-scale cattle production for local consumption. The peasant farmer is preoccupied with satisfying the consumption needs of his immediate family.

The managerial function on a large farm is discharged by a man or men who are engaged exclusively in this activity while the small farmer manages his farm in conjunction with his work on his farm and in employment outside.⁴⁸

Peasant farmers seek employment to supplement their income. Farming supplements the income of some of the largest property owners. The professions, politics and business supply these with their main source of income. Some full-

48 Edwards, op. cit., pp. 27-28.

time farmers add to their income by investments in business ventures.

A. <u>Technology</u>

The technology on peasant farms is less sophisticated than that on their bigger neighbours. Large farmers own wheeled and crawler tractors, pumps, equipment for applying herbicides, and in a few cases electric power plants. Only hand tools, such as forks, spades, machetes and hoes, are owned by peasant farmers. The majority of these tools may be found on large farms but they are used as supplements to machinery by peasant employees. Most small cane farmers on the plains hire tractors to do their tillage. These are often employees of the West Indies Sugar Company and other tradesmen who cultivate 4 to 10 acres. Their units are small but in reality they belong to the lower middle class who practice part-time sugar cane farming.

B. Care of Plants and Animals

It has been shown that large farmers are generally better educated than small farmers. A number of the former are well trained professionals in medicine, law and teaching. These are part-time farmers. A number of men with business background are engaged in farming in the parish. The majority of large property owners interviewed had at least a high school education. A few had agricultural training. Generally, the level of education of peasant farmers does not exceed the elementary grades. These differences are reflected in their care of plants and animals, in their ability to benefit from training programmes and in their general management practices.

Large farmers tend to be more scientific. They more frequently apply fertilizers. More precautions are taken to protect plants from pests and diseases. Their animal husbandry is superior. The spraying of animals with insecticides, the cultivation of pangola grass, division of pastures into paddocks and rotational grazing are characteristics of many large farms. Peasant farmers are frequently lacking in knowledge, facilities, capital and space to practise these activities. They are often forced to use the facilities provided by the large farmer at low rentals when these are available.

A few peasant farmers are planting pangola. This is an encouraging sign but much remains to be achieved by this group.

C. <u>Labour Supply</u>

Labour shortage is common to both groups of farmers. However, the peasant farmer experiences the adverse effects of the shortage to a greater extent because of his less competitive position. Many unskilled and semi-skilled workers prefer to work on the large farms where more employment is available. This means greater security to them. They find employment for four or five days weekly during harvest compared with one or two days on peasant farms. In addition, they obtain the incentives already described and more reliable payment for services.

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D. Land Values and Transactions

It is natural for the values of land to vary with the quality, usage, location and demand. The average value of farm land in Westmoreland is approximately \$264 (±100) per acre. It ranges from \$105.60 (±40) in the hilly areas to \$396.00 (±150) an acre on the alluvial plains. Residential sites cost \$211.20 (±80) to \$1,584 (±600) an acre. Commercial sites vary in Grange Hill from \$528 (±200) to \$2,640 (±1,000) for each acre.⁴⁹

49 Established from Questionnaires.

Transactions in land do not seem to be very frequent. This is because of pride in the ownership of land, especially parcels containing the family burial plot. For this reason, many parcels remain the hereditary property of one family for generations.

Lands which change hands do so more often among large property holders and the middle class than among peasant farmers. A probable reason for this difference is the greater availability of capital and credit facilities to the former groups.

Large property holders enjoy the advantage of largescale purchases which tend to reduce the cost per acre. They also have greater bargaining powers which influence their purchases. Their aims are different from the peasant farmers. Because of better education, large farmers tend to emphasize the economic viability of their farms to a greater degree than their smaller neighbours. A sale of property in one area is sometimes used to consolidate another farm by acquiring urgently needed capital for investment or machinery. An acquisition of newly purchased property serves the same consolidating purpose by providing crops, machines and livestock.

The peasant farmers interviewed tend to purchase house-plots after years of sacrifice and saving. Transfers

of land among them vary from 0.25 of an acre to 2 acres, generally. One exception sold 16 acres. Land transactions among the peasant farmers are highest in less accessible areas. King's Pen is an outstanding example. All but two of the ex-service men who received their initial grants in this area have sold their land.⁵⁰

Speculators are apparently finding a foothold in Westmoreland. It was noted elsewhere that one policy of the West Indies Sugar Company is to give or sell land at nominal prices for settlement and other purposes.⁵¹ Mint Farm, one of its properties, is currently (1968) for sale. The price of \$264 (El00) an acre is certainly not nominal. It is rumoured that these farm lands were intended by Frome management to be sold for half the present price but some of the Company's wealthy employees have bought all the land and are re-selling it at the current price. Minimum lots of five acres are sold for \$1,320 (E500) each.⁵² This is clearly out of keeping with Company policy and should be investigated and changed.

⁵⁰ Interview: Arthur Grant, Ex-serviceman, Burnt Savannah, January 29, 1968.

⁵¹ West Indies Sugar Company, <u>W.I.S. Co. in Jamaica</u>, p. 16.

 5^2 Established from interviews with farmers who purchased some of these lots.

E. <u>Yield</u>

Because of the better soils on which the majority of large farms are located and partly because of more scientific cultural practices, they generally give higher returns than do small fields. Sugar cane farms are the chief examples which allow a quantitative comparison of both groups. The largest type of farm, the plantation, had yields of 32.87, 32.10 and 32.93 tons of sugar cane an acre in 1964, 1965 and 1966 respectively.53 A newly planted acre produces about 35 tons. Large farmers get average returns of 25 to 30 tons from each acre. Peasant farmers get 15 to 20 tons from an acre of sugar cane. Ten to 12 tons an acre are more common in the hilly areas of Darliston and Moreland Hill. A few examples were found where over-extended ratoons cause the yield to fall to 6 tons an acre.

The cattle with the high percentage of "creole" blood which are owned by most peasants who rear cattle give low milk and beef yields. Low returns from these animals are partly the result of minimum care. The peasant farmer is lacking the area, grass and equipment necessary

53 Beckford, op. cit.

to provide adequate care for cattle. It is encouraging that a number of peasant farmers are planting pangola on their small units on the plains and at King's Pen. However, without the acquisition of greater acreage, only little improvement can be expected in animal husbandry on these farms. The large farms have the space, better varieties of cattle, more cultivated pasture, some equipment, and the personnel to provide the care. Consequently, they get better results.

F. Land Tenure

The 1961 agricultural census shows that 65.5 per cent of the farms in Westmoreland were purchased by their owners. Twenty-eight per cent were inherited and the remainder were rented, squatted or received as gifts.

A higher percentage of large farms (30.7%) were inherited than peasant farms (25.5%). The differences between the two groups in the percentage of land purchased was not significant - 1% in favour of the peasant farmers.⁵⁴

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⁵⁴ The comparison is made of the proportion of small and large farms which were purchased. It is not implied that the small farmer purchased or inherited more acreage. The reverse is true as is expected from the greater resources at the disposal of the large farmer.

It is apparent that the larger property owners have less need to rent land and no need to be squatters while the peasant farmers may find these means necessary to supplement their marginal income. For this reason, a greater proportion of the land used by small farmers is rented, squatted or leased than is the case among large land owners. (See Appendix VIII.)

Other plots are leased or used at a nominal rent. Thirteen cents (1/-) is the rate that is commonly charged by large property owners and the West Indies Sugar Company for renting land on the hills. The farmer clears whatever size plot he chooses and plants ground provisions. As a rule, the offer and acceptance of these plots are based on good faith. Since they are often in remote stony areas, they are not likely to be destroyed by roving cattle.

Inherited land may be owned jointly or individually. "Individual ownership corresponds to the legal category 'ownership in fee simple.'"55

Family land is owned jointly by two or more members of a family and is seldom sold. The right of ownership remains even if some of the joint owners do not use their share. They may relinquish their right of ownership if

55 Edwards, op. cit., p. 95.

they so desire.

Individual ownership of land for which there is a valid registered Title is the best form of ownership. Some farmers are unable to show valid Titles for their land but this does not generally impede land use beyond limiting credit availability. Neighbours recognize their informal ownership and the owners cultivate with confidence. In some cases, timber trees are cultivated for their children's benefit although parents do not expect to live long enough to reap them. The inability to obtain credit because of lack of land title can be a major limitation since it might prevent the farmer from obtaining much needed capital for agricultural development.

Leased or rented land does not offer any encouragement to plant trees unless it included an option to buy.⁵⁶ Leases were seldom encountered in Westmoreland. The duration of each lease is four or five years. This only permitted the cultivation of short term and semi-permanent crops. Farmers feared that they would be evicted from the land they cultivated in permanent crops before they could reap them. This type of land tenure promotes a feeling of insecurity and lack of independence among

56 Ibid., p. 112.

farmers who complain of inability to prepare for their old age by planting fruit trees. By causing insecurity, it discourages agricultural development.

Rent varies from \$10.56 (E4) per acre for land on which vegetables are to be cultivated, to \$21.12 (E8) for rice land. It costs \$5.28 (E2) to rent 0.1 acre for a house plot and \$13.20 (E5) or \$15.84 (E6) for an acre to cultivate sugar cane. The West Indies Sugar Company's nominal rent is \$2.64 (E1) for an acre of swamp for rice cultivation.57

Tenancy has the advantage of making land available for use by the landless. A major disadvantage is its increased cost of production to marginal producers who are the chief tenants. It costs less, in the long run, to own land and pay taxes than to lease or rent property.

Relatives and friends are sometimes allowed to use land free of charge for a fixed time. Others may be required to pay in kind for the right to use certain portions of a property. These people generally plant short term and semi-permanent crops.

Squatters have no rights and can be evicted at the owner's will. Two squatter colonies were encountered in

57 Established from questionnaires.

Westmoreland. About 100 families live on Spring Vale property. These families have lived there for a number of generations. They provide part of the labour supply for the large sugar farm. The other group of squatters was seen at White House. They occupy part of the government property in the area. Some of them are members of the Rastafarian cult.⁵⁸ They cultivate subsistence plots in the hills and fish as their chief means of livelihood. White House is a fishing village.

In summary, land tenure in Westmoreland includes purchased, inherited, rented and other less important forms of property-holding. Individual ownership with a valid land title is the type of tenure which provides the greatest security to the farmer and offers the best prospects for long-term utilization and development of the land.

⁵⁸ Rastafarianism is a religious cult. The brethren create social problems in the urban slums of Kingston and Montego Bay.

CHAPTER VI

MARKETING

Markets - Domestic and Foreign - are discussed in the following paragraphs. They present a historical geographic survey of price changes, and the international and local factors which influence the marketing of major agricultural products. An assessment is made of the influence of demand and price fluctuations on agricultural productivity. The role of the Jamaican Government in marketing is developed as one of the themes.

1. DOMESTIC MARKETS

In Westmoreland, local marketing of products takes many forms. Some products are bought and sold in organized Parish Council markets and others are purchased by the Agricultural Marketing Corporation, the Jamaica Agricultural Society, local industries and individuals, and the All-Island Banana Growers' Association. A few farmers sell the major portion of their farm products outside of the parish to the Agricultural Development Corporation Rice Plant at Spanish Town, to itinerant purchasers from Kingston, to the Bog Walk Condensary and in some parish capitals.

A. Parish Council Markets

Fourteen markets have been constructed by the Westmoreland Parish Council during a period of about fifty years. They are located in the most densely populated centres. Those at Savannah-la-Mar, Grange Hill, Frome and Little London are the most important as indicated by their annual volume of trade.

Market fees are charged to farmers and vendors who take provisions, meat, groceries and clothing to these structures for sale.

The local government constructs and supervises the buildings. Its objective is to let them pay for their construction and maintenance costs. They are not intended as profit-making establishments but to stimulate agricultural and economic development by providing market centres for members of the community, services they could not efficiently provide for themselves individually.

Fees for this service vary from 79% (6/-) for each beef cattle carcase, to 6d. in the E (7¢ Canadian) of the value of fruits and rice. (See Appendix IX.)¹ The fees are

¹ Extracted from "Westmoreland Parish Council Schedule of Market Fees" exhibited at the office of the Savannah-la-Mar Parish Council market, January 25, 1968.

assessed by the market clerk at each centre. Some assessments are made subjectively. The majority seem to be assessed objectively to the satisfaction of the users.

Approximately £8,000 (\$21,120) is collected annually by these markets in Westmoreland. Most transactions occur from December to June.² December to February is the harvesting period for yams (<u>Dioscorea spp</u>.)³ Other ground provisions may last until the break of the spring rains of late April to early May. Some citrus fruits were being harvested in Seaford Town in February but reaping in May is most suitable to the Citrus Growers' Association.⁴ The volume of products marketed at these centres depends on the supply of goods and the alternative outlets which are available.

The planting of certain crops begins in the last weeks of April or in early May. During the period of growth and care, or "weeding time" locally, some products are only available in limited supply. Consequently, July to November is the period of least receipts of revenue by these markets. April to June may be regarded as the

² Marketing Supervisor for Westmoreland, Savanna-la-Mar, January 25, 1968.

3 Jamaica Agricultural Society, <u>The Farmers'</u> <u>Guide</u>, p. 548.

⁴ Citrus Growers[#] Association Limited, <u>Report of the</u> <u>Directors and Statements of Account 1964-1965</u> (Kingston, Ja.: The Art Printer Ltd.), p. 12.

transition period when late crops are harvested and when even a limited storage of supplies from December to February would make products available for sale.

Ground provisions are the chief goods sold in these markets. However, a wide variety of agricultural and industrial goods are on display.

The objective of letting the markets pay for their maintenance and administrative costs is achieved by five of the centres. The others are subsidized.

Some limitations of this branch of the marketing system are: inadequate supply of facilities, an excessive number in certain areas, and adverse political influence on local government markets. They are discussed and suggestions made for their improvement in "Marketing Criticisms."

B. Higgling

"Higgling" is peddling. Pemales are the chief "higglers," although a small number of men peddle their wares in similar fashion. These pedlars purchase agricultural products from farmers in the fields or at the farmers' homes. Subsequently, the goods are sold at parish council markets within Westmoreland, at Montego Bay, Kingston or Mandeville, or in a few other parish capitals. A significant proportion of ground provisions, citrus, coconuts (<u>Cocos nucifera</u>), breadfruits (<u>Artocarous incisa</u>), and other products are conveyed to markets by pedlars. Some farm wives sell produce and use the income derived to purchase clothing and other wholesale goods for re-sale locally.

C. Itinerant Butchers

Local and itinerant butchers purchase livestock for slaughter. The itinerants visit the districts in search of cattle, goats and pigs. These visitors may be from within the parish or from other parishes. Some large producers sell their beef cattle to butchers in Kingston. The butchers maintain contact with the cattle rearers and send trucks for the livestock at fixed periods.

A market is being found locally on a large scale because Western Meat Packers slaughters livestock for a number of supermarkets in Kingston. Farmers in the Bethel Town and Seaford Town districts are visited by butchers from Montego Bay.

D. The Agricultural Marketing Corporation

On July 25, 1963, the Parliament of Jamaica passed an Act for the establishment of the Agricultural Marketing Corporation. The Corporation held its first meeting on the 13th of December, 1963, and has been operating on an extensive scale since that time.

It was created in order to increase local food production by providing an efficient and a dynamic marketing system. Its secondary objective is the providing of inexpensive food to the public.⁵ The Government Marketing Department which it succeeded was established during the war to promote local food production in order to increase self-Because of Government restrictions, the sufficiency. Department's main function was to supply government insti-Insufficient efforts were made to tutions with produce. provide organized marketing for local products. This deficiency was recognized, as well as its adverse effects on production of certain crops and the nation's balance of payments. Many products are being bought which could be produced locally. Some can be grown in export quantities.

⁵ William Charles Found, "Land Use Patterns and Problems in Selected Land Settlements in South Central Jamaica: A Study in Multiple Regression Analysis," Ph.D. Dissertation, University of Florida, February, 1966), p. 92.

Consequently, the Agricultural Marketing Corporation was forced to improve these conditions.

The functions of the Corporation are as follows:

- (a) to provide and maintain adequate marketing outlets for agricultural produce;
- (b) to buy and sell agricultural produce;
- (c) to provide for the collection, transportation, storage, grading, packing and processing of agricultural produce.

It may borrow money with the approval of the Minister of Agriculture and Lands for some purposes. It is partly financed by grants and advances from the Government.⁶

Westmoreland is connected with the Corporation in a number of ways which are the main focus of this subsection. Some farmers have contracts to supply products to the Corporation. Contracts are made for one year and are subject to review at the expiration of that period. Prices for the produce are stipulated in the contracts.7 Only a minimum guaranteed price is fixed since prices fluctuate. When price rises the new price is paid to the farmer.

The tendency is for large farmers to be the chief

6 R. K. Aquart (Chairman), <u>Agricultural Marketing</u> <u>Corporation, First Report for the 1st December 1963 to</u> <u>31st March 1965</u> (Kingston, Jamaica: Producers' Road, June, 1965), pp. 8-9.

7 Ibid., p. 12.

producers on contract with the Corporation. The apparent indifference of small farmers arose from a belief that the Corporation will purchase their crops in such quantities as are produced, and hence there is no need to sign formal contracts.⁸ Some farmers object to what is regarded as the rigid grading practice of the Corporation. They are unaccustomed to the grading of certain products.⁹ Products are bought on Tuesdays at nine buying stations: Sheffield, Borderline, Springfield, Lamb's River, Seaford Town, Kew Park, Darliston, Holly Hill and Big Wood, in Westmoreland.¹⁰ (See Appendix X). Cash payments are made at the open market rates at these stations. Most small farmers of the parish can easily sell their limited and unreliable supply to other local buyers where no contract is desired and the average price is greater.

Five users and some farmers who formerly made use of these facilities were interviewed. They complained that the Corporation price is lower than that obtained from pedlars and from the sale of their goods in the Parish Council markets. For example, the Corporation pays \$3.30

⁸ Aquart, op. cit., p. 16.

⁹ <u>Found</u>, op. cit., p. 93.

10 Aquart, op. cit., p. 25.

(\pm 1..5/-) for each 100 pounds of cabbage (<u>Brassica oleracea</u>) and the price in the retail market is \$13.20 (\pm 5) per 100 pounds.¹¹

The local market price is subject to fluctuations to about half the current (February, 1968) retail price of \$13.20 per 100 pounds. In addition to the more stable price offered by the Corporation, it saves time to the farmer and guarantees a market for all his products. His gains are not as great as the difference in price suggests. When he sells his goods in the Parish Council markets, he frequently spends a day or two at the market which could be spent productively on his farm. This market is less secure since he has no guarantee that all his goods will be In practice, farmers return on many weekends with sold. a portion of their produce unsold. This will spoil. In some cases, in order to avoid spoilage, farmers sell a substantial proportion at reduced prices on Saturday afternoons.

The Corporation has to buy at rates much lower than the retail prices quoted above because its goods are bought primarily for wholesale purchasers. It also

¹¹ Established from questionnaires. Cabbage was retailed for 1/- (13¢ Canadian) per pound at the Parish Council Markets during the writer's visit in February, 1968. "Higglers" purchase this product from farmers for from 6d to 9d (7¢ to 10¢ Canadian) per pound.

absorbs the transportation costs and capital costs for storage. Farmers who sell the goods through Parish Council markets have to pay the transportation costs themselves. This is another factor which reduces their apparent gain.

Many small farmers would probably have a more favourable opinion of the Corporation and give it more support if they could be made to realize that there is more to be gained from supporting this statutory body than promoting disorganized marketing.

Some vegetables, pumpkins (<u>Curcurbita pepo</u>), melons (<u>Citrullus vulgaris</u>), horse plantain (<u>Musa paradisiaca</u>), and yams (<u>Dioscorea spp</u>.) are bought on contract by the Corporation.¹² A variety of other farm products such as eggs, potatoes (<u>Ibomoea batata</u>) and ginger (<u>Zingiber</u> <u>officinale</u>) are bought on the open market.¹³

A current belief is that Westmoreland is without a Corporation branch because three of its four representatives are supporters of the opposition party. The Montego Branch is the nearest centre with storage facilities. It offers some hope for improved marketing and productivity in the western parishes.

12 Aquart, op. cit., p. 12.

13 Ibid., pp. 16-17.

E. The Banana Board

A statutory body, the Banana Board, was established by the government to direct, supervise and control the banana industry of Jamaica. It fixes the price paid to producers, sponsors the Banana Rehabilitation and Expansion Scheme, establishes boxing stations for the proper handling and shipment of bananas, and negotiates export prices for its marketing agents, Elders and Fifes, Limited and the Jamaica Producers' Marketing Company, Limited.¹⁴ The Board makes loans in order to maintain a reasonable price to producers and it pays into the Hurricane Insurance Fund on behalf of growers a cess of 3d (4ϕ) for every 28 pounds of bananas it purchases.¹⁵

Its major marketing problem is discussed under the subtitle "a problem of the banam industry." Westmoreland benefits from its credit scheme, insurance, subsidies, fertilizer and spraying facilities. These are discussed under "the All-Island Banana Growers' Association."

14 Central Planning Unit, Economic Survey Jamaica 1965, pp. 54-55.

¹⁵ "Statement by Mr. K. F. Jones, Chairman, Banana Board 4/1/68," p. 1. (Typed manuscript).

F. Other Local Marketing Bodies

In addition to the main markets previously discussed, some marketing agencies and industries which purchase farmers' products are summarized. The most important are the Jamaica Agricultural Society, the Citrus Growers' Association Limited, and the Bybrook Condensary.

(1) Citrus Growers' Association, Limited

The services of the Citrus Growers' Association are not widely used in Westmoreland. This is mainly because the parish is not a major producer of citrus. A few farmers use the marketing and processing facilities which it provides. It purchases fresh citrus from farmers throughout Jamaica. Some of this fruit is processed at its plant, Juciful Limited.

Processed and boxed fruit is sold locally to supermarkets by the Association. The majority is exported to the United Kingdom and New Zealand. The Association is the largest supplier of orange concentrate to the British Ministry of Health.¹⁶ Canada and the United States are

¹⁶ Citrus Growers' Association Limited, <u>Report of</u> the Directors and Statements of Accounts, 1964-1965, p. 12.

other importers of Jamaican citrus.

Four other processors purchase citrus from farmers locally. These are Messrs. Jamaica Citrus Growers Limited, Citrus Company of Jamaica Limited, Caribbean Preserving Company Limited and DeCosta Brothers. They re-sell locally and to the above foreign markets.

The citrus industry is very competitive and the demand for high ratio concentrates makes it necessary for supplies to reach the processors in May, when the fruits are less watery prior to the rainy season.

The present trend is toward an expansion of the domestic market.¹⁷ The tendency for increased local demand to cause products to be diverted into the local market is also evident in the citrus industry. As a result, higher prices were paid to growers by the Association in order to increase supplies for export so as to fulfil contractual obligations for concentrated juice and fresh fruit.¹⁸

An important function of the Citrus Growers' Association is negotiation with foreign purchasers concerning the amount of citrus fruit and concentrates to be supplied by Jamaica.

17 Ibid., p. 4.

18 Central Planning Unit, Economic....1966, p. 54.

In Westmoreland, citrus production increased in 1967 mainly because of good weather conditions and the early application of fertilizers. A yield of 270 boxes per acre was obtained as against 250 the previous year. Some 270 acres were reported.¹⁹ (Appendix VII)

(2) Bybrook Condensary

Although milk production remained at an average of 2.5 quarts per cow in Westmoreland during 1966 and 1967, the total milk production fell because dairy cattle decreased by 300 cows to 9,000 in the latter year. (See Table 13.) Milk production has decreased because a few farmers have converted their dairy farms to beef cattle production in 1967.²⁰

Milk is sold to local households, the government institutions in Savanna-la-Mar, and the Bybrook Condensary in Saint Catherine. Trucks are sent by the factory to collect milk from farmers who supply on contract to the Condensary. Large and small farmers complain that the price paid by the Condensary is too low to ensure profitable

19 The Ministry of Agriculture...., Annual Report 1966-1967, p. 3.

20 Ibid., p. 5.

TABLE 13

LIVESTOCK PRODUCTION

Tvae of		Population		μ.	roduction		
Livestock	31.3.66	31.3.67	Increase or Decrease (/ or -)	31.3.66	31.3.67	Increase or Decrease (≠ or -)	Unit
Dairy Cattle	9,300	000 ° 6	-300	2.5	2.5	B	Quarts per cow.
Beef Cattle	15,500	15,000	-500	1,00	400	8	Lbs. dressed weight at 2 yrs.
ର ସ ଅ	3,500	3,600	7100	65	65	ł	Lbs. dressed weight at 6 mths.
Poultry (layers)	6,500	10,000	<i>∤</i> 3,500	200	200	8 8	Eggs per bird each year.
Goats	13,500	13,000	-500	14	7r	e ĝ	Lbs. dressed per head at 6 months.

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productivity. Each farmer receives 9% (8d) to 13% (1/-) per quart from the Condensary. Local buyers pay 50 per cent higher (1/6d) a quart. Most of the dairy farmers interviewed believe that the retail price is the more realistic. They make no allowance for the capital cost of the Condensary and the more reliable market which it provides. No small farmer was encountered who supplied milk to the Condensary.

(3) The Jamaica Agricultural Society

The Jamaica Agricultural Society has many branches in Westmoreland. It fulfills many other useful functions besides marketing. These will be discussed in the next chapter. As a marketing agency, the Society is not particularly impressive in Westmoreland. Only two farmers were encountered who utilized its marketing facilities. This is partly because of the limited number of crops marketed by the Society. It purchases anatto (<u>Bixa</u> <u>orellana</u>) and ginger (<u>Zingiber officinale</u>) which are produced on a minor scale in the parish. An exception is its purchases of pimento (<u>pimenta officinalis</u>). The Society's influence is believed to be expanding in the marketing of pimento. Some large farmers market their berries to other purchasers in Kingston and Montego Bay.

2. FOREIGN MARKETS

Some foreign markets were discussed to an extent when they were linked with the Banana Board. The domestic and foreign markets are inter-related and their definition depends on the point of view from which the purchase is analyzed. For the purpose of this study, a foreign market is any country which trades with Jamaica. The domestic market is Jamaican territory where transactions are made primarily by local residents in order to provide the goods and services for permanent and temporary residents.

This section discusses the sugar trade. It presents a historical survey of the major international conflicts which influence price fluctuations, the effect of international agreements on the sale of major products of Westmoreland, and the extent to which the economy of the parish has been affected by these changes since the eighteenth century. More specific information is available for Frome since 1938. Some retrospective views are presented to explain the general factors which influenced the marketing of sugar before that date.

A. Sugar Trade

The Frome Estate, as previously explained, was
established through the amalgamation of several estates in 1938. After the construction of Frome Central at that time, the nucleus was provided for increased productivity and extensive trading in sugar.

Higher prices, assured markets and better representation are the major factors which influence the marketing of Jamaican sugar. The price of sugar was low immediately before the beginning of the Second World War in Europe (1939). The outbreak of that war brought a quick rise in sugar prices.²¹ Britain introduced rationing and arranged for the purchase of exportable surplus from her Dominions and colonies.²² This increased the price. This increase and the higher demand stimulated production at Frome from 21,856 tons of sugar in 1938 to 30,251 in 1941. Riots, in 1938, which resulted in the burning of cane fields and the destruction of tools and buildings were partly responsible for the decline in production in 1939 and 1940.²³

The United Kingdom had agreed during the war to purchase all available export sugar from the colonies at fixed prices. This policy was continued until 1952.

²¹ Timoshenko and Swerling, <u>op</u>. <u>cit.</u>, p. 164.
²² Ibid., p. 166.

23 The West..., W. I. S. Co. in Jamaica, pp. 10-11.

Provision was made during this period for part of the sugar to be diverted to Canada.

In order to protect themselves, sugar manufacturers had agreed to pool their resources on the export market so that they would receive the same price. Prior to that agreement, each sugar manufacturer sold his supply individually. As a result, the price varied by as much as \$5.98 (L2) per ton at times.²⁴ Sugar manufacturers were therefore competing amongst themselves to the disadvantage of the industry as a whole. When it became necessary to sell a part of their export sugar (the FREE Quota) at competitive prices in the United Kingdom and Canada after 1952, they agreed to let a single seller market and pool their sales. They eliminated small competing units by this method and benefited from the services of an experienced sales representative and from shipping at the most economic freight rates. This single seller arrangement was subsequently adopted for the sale of the international Quota and for the sale of non-quota and quota sugar to the United States.²⁵

25 Bloomfield, op. cit., pp. 9-10.

²⁴ Dominion Bureau of Statistics, <u>The Canadian</u> Balance of International Payments a Compendium of Statistics from 1946-1965. (Ottawa: Queens Printer, March, 1967), p. 234. The average exchange value of the British <u>L</u> in 1952 was \$2.99 (Canadian).

A number of other factors have influenced the marketing of sugar since the war. The most important of these were the formation of the British West Indies Sugar Association (Incorporated), the Commonwealth Sugar Agreement of 1951, and the taking over of Cuba by the Castro regime.

The British West Indies Sugar Association made representation on behalf of the West Indies and British Guiana which led to better prices immediately after the war. There was no limit to the amount of locally produced sugar which could be exported by Jamaica except that which was retained for local consumption. This continued until 1953.²⁶

The Commonwealth Sugar Agreement of 1951 which became operative in 1953, limited the country's sugar export. This Agreement came as a result of the manufacturers' desire to eliminate the rare periods of boom and prolonged periods of depression which were characteristic of the pre-World War II period.²⁷

A new International Sugar Agreement signed in 1953 came into operation the following year. Jamaica's export of sugar was limited at that time to the total quotas of

26 Ibid., p. 7

²⁷ Tacke and Stephanov, <u>op</u>. <u>cit</u>., p. 193.

the International Sugar and Commonwealth Sugar Agreements. This condition prevailed until 1960.

As a result of Castro's nationalization of the Cuban sugar industry, the United States of America ceased to buy sugar from Cuba and increased its purchases from other West Indian countries. Jamaica received a non-quota allocation from the United States. Other subsequent changes in United States policy have resulted in the reallocation of quotas to Jamaica until the end of 1971.²⁸

It is evident from the general increase in production at Frome during these years that the agreements have provided reliable outlets at prices which stimulated production.

B. Prices and Producers

Price-fixing varies from one product to another. In major export crops, prices are established after negotiation and formal agreements between states. Some are established as a result of supply and demand. A third group is fixed internally by the Jamaica Government after giving some consideration to supply and demand and the need

28 Bloomfield, op. cit., p. 8.

to encourage local production.

The tendency is for existing prices to encourage productive expansion when they are high or satisfactory. They tend to result in contraction if they remain low for extended periods. When the price paid by the Government is lower than that paid by private markets, the trend is for more goods to be diverted to the private sectors which offer better remuneration. (See "Agricultural Marketing Corporation," Pages 163-164 for the reason for the lower government price).

Sugar prices are fixed in order to be reasonably remunerative to efficient producers. A price index is established...in the Commonwealth Sugar Agreement which takes into account movements in the level of wages and the prices of goods and services entering into costs incurred in producing sugar.²⁹

Formerly, representatives from Commonwealth sugar-producing countries met annually in October and November to fix an average price. This was done in conjunction with representatives of the British Government.

An agreement was reached at the 1966 Conference to establish a Negotiated Price Quota for three years, 1966-1968.³⁰ At the end of this period the price structure

29 Ibid., p. 10

30 The Negotiated Price Quota is the amount of sugar which the United Kingdom agrees to purchase at negotiated prices annually. will be reviewed. A basic price of \$129.63 (£43..10) was established for all exporting territories and a special additional payment of \$4.47 (£1..10) per ton for the less developed exporting countries, including Jamaica. As a result of subsequent adjustments, the agreement has been extended to December 31, 1973.³¹

The price of sugar on the Canadian and United States markets differs. Canadian prices are based on

...a deferred pricing basis which enables the purchaser and the seller to receive an average of world market prices spread over given periods.32

It protects both the seller and the buyer by protecting the former from having to sell at the lowest price and the purchaser from having to pay the highest price during market fluctuations. Canada also grants a preference to Jamaica for FREE Quota sugar.³³

Prices paid by the United States for sugar are regulated by the American Department of Agriculture, and are based on a two price system. One is concerned with ensuring a reasonable profit to American producers and is

31 The All-Island Jamaica Cane..., Silver Anniversary Report, pp. 19-20. The average exchange value of the L was \$2.98 (Canadian) in 1966.

32 Ibid., p. 10.

33 A FREE Quota is intended to cover export of sugar to Canada and to supply additional export to the United Kingdom whenever the latter is required by the United Kingdom's Government.

therefore outside the focus of this study. The second is established under a Global Quota system and is studied, since Jamaican sugar enters the United States via this channel.

Cuba was the chief supplier of sugar to the United States until 1960 when the American market was closed to Cuban sugar after Castro's seizure of power. The Global Quota which was established represents the quantity of sugar reserved by the United States for importation from Cuba in the event that diplomatic relations were resumed between the two countries. Sugar is purchased under the Global Quota at the equivalent of world market prices.³⁴ During 1963 and 1964, the United States was able to buy sugar at prices below the high world market prices because foreign suppliers were anxious to establish their ability to maintain regular shipments to that country.³⁵ Jamaica experienced a production boom during these years because of the high prices and the assured markets.

C. International Conflicts and Prices

International conflicts invariably result in sharp

³⁴ Bloomfield, <u>op. cit.</u>, p. 8.
35 <u>Ibid.</u>, p. 11.

rises in prices. This is because demand for sugar and other agricultural and manufactured products rises significantly at such periods. The major powers tend to increase their stockpiles of these products in the interest of their national security.

Four International conflicts, which influenced price changes significantly are the topics of the following discussion. They are the Napoleonic Wars, the two World Wars, and the Arab-Israeli crisis.

For a period of forty-years, from 1795, Jamaican sugar production remained at what was described as a high level for those days. A peak was reached in 1805. "This record was stimulated by high prices, largely the result of the Napoleonic Wars." Prices varied from ±50 to ±60 per ton.³⁶ Production declined after the Napoleonic Wars because of the lifting of the continental blockade, emancipation (1838) and associated socio-economic problems such as labour shortage and increased costs, the adoption by the British Government of a Free Trade policy (1848) in which Jamaica lost her "duty free" advantage and consequently, failed to compete with Cuba on the British market. Jamaican sugar continued to fetch low prices abroad in the

³⁶ There was no Canadian standard money in the legal sense until after Confederation.

years between the Napoleonic Wars and the first World War. Other local problems such as epidemics--Asiatic Cholera (1850) which killed 32,000 people; small pox which claimed a number of victims two years later--a severe draught in 1863, and disastrous hurricanes over the north-eastern parishes (1903) and over the western parishes (1912), contributed to the reduction of sugar production during the above inter-war years.³⁷

Another period of inflated prices, increased production and prosperity was stimulated by the first World War. The price of sugar rose to over ±100 (\$486 American) for each ton. This was followed by a slump because of overproduction.³⁸

Better prices were also obtained immediately after the second World War. By then the modifying effect of international control was evident. World Free or non-quota sugar is the chief type subject to great price fluctuations. This, in fact, is surplus sugar.

The effect of the Cuban crisis in stimulating a rise in the price of sugar has been explained. In addition,

37 The Gleaver Company Ltd., <u>op</u>. <u>cit</u>., p. 55 and pp. 62-63.

³⁸ Bloomfield, <u>op. cit.</u>, p. 2. The Gold Sovereign in Britain had an exchange value of one gold dollar. The gold dollar and the sovereign had an exchange value of \$4.86 (American) each. Source: <u>The World Almanac and Encyclopedia, 1915</u>. (New York: The Press Publishing Co., 1914), p. 303.

it resulted in the expansion of the United States market for Jamaican sugar.

A more short-lived stimulus to the industry was the Middle East crisis of 1967. The price of World Free (or surplus) sugar rose from a low of \$34.32 (L13) in May to \$84.48 (L32) a long ton in June 1967. The new price was the highest in two and a half years. Within days the new level, which was approximating production costs, fell to its former depressed levels.³⁹

Price fluctuations and resultant over-production, depressions and booms are characteristic of the sugar industry. Consequently, the best hope for stability is continued international price and quota control.

(1) Prices_of_Domestic Sugar

The local prices of sugar are fixed by the Jamaica Government. Two sets of prices exist on the local market, a retail and a wholesale price. Prices to the retail trade or household consumer are published in the Jamaica Gazette whenever they are fixed. Manufacturers and processors of agricultural products, who use sugar for these purposes,

³⁹ The All-Island Jamaica Cane..., <u>Twenty-Sixth</u> Annual Report, pp. 3-4. purchase refined sugar at prices equivalent to that of "raw sugar" prevailing on the world market. The Sugar Manufacturers' Association and processors have agreements covering the prices. Because of the low world market prices for sugar and their effect on reducing the revenues derived from purchases by processors, the Association has submitted a new formula to the Government which, they believe, will adjust the imbalance.⁴⁰

A prominent manufacturer interviewed believes that the price of sugar on the local market is too low. It will probably remain at the present price for a few more years, to the advantage of the consumer, for changes in sugar prices can have serious political overtones locally. The present Governor-General formerly lost his seat as the representative for Western Westmoreland partly because he cast the deciding vote to increase the price of sugar when he was the Speaker of the House of Representatives. Hence, any increase in the price of local sugar must be carefully justified to the voters.

(2) The Prices of Other Products

This subsection is partly a summary of the prices of

⁴⁰ Bloomfield, <u>op</u>. <u>cit</u>., p. 13. The formula has not been supplied by the source.

products for the local and foreign markets. Some of these were incidentally referred to in previous paragraphs. The chief examples are pimento, citrus, banana, cocoa, rice and ground provisions. An explanation of farmer's response to prevailing prices is included in these discussions.

Pimento is one of the most lucrative agricultural products in Westmoreland. Farmers received 66ϕ (5/-) per pound of dried berries in 1966.⁴¹ Producers are generally satisfied with the high price obtained for this product. The main reason for the high price is the shortage of supply. Jamaica is the chief exporter of pimento and its by-products. Much potential exists for the expansion of this industry in the island.

The price paid to coffee growers is increasing. It rose from 2/6 3/4 d in 1965 to 3/1 3/4 d per pound in 1966. This increase should be satisfying to growers in a period of relatively high overseas prices for coffee.⁴²

Although the average price of bananas was less in 1966 than in 1965, the farmer was not adversely affected. The Banana Board decreased and increased the average price from 1.319d and 2.747d per pound for wadding-wrapped and boxed fruit (1965) respectively to 1.315d and 3.066d in

⁴¹ The Central Planning Unit, <u>Economic Survey</u> Jamaica 1966, p. 59.

⁴² Ibid., p. 58.

1966,⁴³ in order to provide incentives for increased production. The price of wadding-wrapped fruit was reduced to encourage boxing. Higher prices are obtained for boxed fruits and they secure the market and reduce waste from damage resulting from shipping. The government has provided boxing facilities for the use of farmers since 1965.

It was shown elsewhere that farmers are dissatisfied with the price paid for vegetable and ground provisions by the Agricultural Marketing Corporation. In Westmoreland, the tendency is to dispose of these products in other local markets where the price is higher. This is particularly prevalent among small farmers. The same approach exists among citrus growers. Large farmers sell a substantial proportion of their oranges to "higglers." They are forced to sell much of their citrus to the Citrus Growers' Association which provides the most reliable large-scale market for this product, locally. Large and small farmers complain that the price paid by the Association is low.

Westmoreland's cocoa (<u>Theobroma cacao</u>) is purchased by the Cocoa Industry Board and fermented at Hortoncourt in Hanover. A price of \$3.73 (25/-) per box (average weight 58 pounds) was paid to farmers in 1966. This was

43 Ibid., p. 52.

twice the price paid to farmers in Ghana and Nigeria in that year.⁴⁴

Although the price of this product is subject to great fluctuations, the traditional European market is increasing its demand for Jamaican fermented cocoa. The local demand is also expanding as a result of a new chocolate factory. Countries which buy the bulk of Jamaican fermented cocoa are the United States, Belgium, Canada, the United Kingdom and Germany.⁴⁵

In 1965, the price for cocoa fell to the post-war low of \$269.10 (L90). The Cocoa Industry Board was able to avoid selling during the period of depressed price. Consequently, the price of \$3.73 per box to growers was not reduced. Prices have recovered to the satisfactory level of \$655.60 (L220) a (long) ton at the end of 1966.⁴⁶

Generally, the prices and marketing of products are influenced by supply and demand, international marketing conditions, world crises, price-fixing and governmental agencies and national policies. Productivity increases or

⁴⁵ <u>Ibid</u>., p. 253. ⁴⁶ Ibid., p. 252.

⁴⁴ Journal of the Jamaica Agricultural Society, The Farmer, November-December 1966, Vol. LXXI, Nos. 11-12, pp. 252-253. The exchange value of the L in 1965 and 1966 was approximately \$2.99 and \$2.98 respectively.

decreases as prices rise and fall. However, the time duration must be fairly prolonged before effects of price reduction on the acreage of permanent and semi-permanent crops are significant. It takes time to abandon these crops or to change to new types of products. Increases in the price of rice tend to have more immediate effects on land use, resulting in expansion onto marginal areas. The tendency is to plough areas which were allowed to lie fallow or break in new land for short term and semipermanent crops such as sugar cane (<u>Saccharum officinarum</u>). corm (<u>Zea mays</u>), and rice (<u>Oryza sativa</u>) as price increases are obtained.

CHAPTER VII

CULTURAL AND SOCIO-ECONOMIC FACTORS INFLUENCING AGRICULTURE

As stated in "Marketing" and "Peasant Farming," the government, statutory bodies and social institutions contribute significantly to agriculture by providing marketing facilities, farmer education, guidance, credit, seeds, fertilizers, and subsidies. The chief topics of discussion are the role of government in agriculture, the All-Island Jamaica Cane Farmers' Association, the Negril Development project, land settlement schemes, the Jamaica Livestock Association, the Land Development and Utilization Commission, the All-Island Jamaica Banana Growers' Association, the Citrus Growers' Association, Limited, the Agricultural Development Corporation, trade unionism and labour, the Ministry of Agriculture and Lands Extension Services, the Jamaica Agricultural Society, and the 4-H Their general aims and functions will be discussed Clubs. and an assessment presented of their effectiveness in Westmoreland. (See definitions for the meaning of cultural).

1. THE ROLE OF GOVERNMENT IN AGRICULTURE

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The role of the Jamaica Government in agriculture is closely related to the majority of the above bodies. Many of them are financed by the government. Some are statutory agencies which it creates and others are private bodies subsidized by and subject to government supervision. Most of the main agricultural programmes in Westmoreland were initiated by the government. The land settlement schemes, Negril Development, the Land Utilization and Development Commission, fish farming, and the Farm Machinery Pools are of current importance.

A. Land Settlement Schemes

In 1938, the Government of Jamaica established a planned land settlement scheme and a Lands Department.

... The new Department was entrusted with the responsibility of settling farmers on new Settlements under a freehold Scheme in order to improve their economic and social well-being.¹

This scheme was instituted as a result of unemployment and labour unrest during that year. The Department is responsible

¹ "The Policy and Functions of the Lands Department and the Philosophy in Connection with the Land Settlement Scheme." (Typed manuscript submitted by the Ministry of Agriculture and Land $/n.d_./$, a Jamaican Government circular), p. 1.

for the creation of communities out of heterogeneous groups of peasant farmers and for providing them with some basic necessities such as roads, proper housing, water supplies, schools and cemeteries.

Some parcels of Crown lands were sold or credited to farmers of Westmoreland from this early date. Gradually other properties were acquired from private individuals and the West Indies Sugar Company. There are nineteen settlements in the parish today. They are still administered by the Lands Department but are subject to review under the proposed Land Reform Programme.

A minority of settlements such as King's Pen, Bonneyside and Barham were granted to ex-service men, the majority of whom are small farmers. With the exception of Bath Pen and Camp Savannah, most are located on hilly uplands and the less fertile soils.

A number of factors account for their location on the less well endowed sites. Property owners generally sell lands of marginal productivity which cease to be economically viable. Bath Pen, for example, was formerly owned by the West Indies Sugar Company. It remained as unimproved pasture during the Company's ownership because of its shallow soil and rocky outcrops which limit the acreage that can be used for cultivation.² Some areas were tenanted before they were

2 Norma Walters, op. cit., pp. 140-141.

acquired by the Government for land settlement. Security of tenure was the foremost consideration when allotting tenanted land. Camp Savannah is an example of this type.³ It was also owned by the West Indies Sugar Company and shows that settlements associated with estates are often located on marginal land. Prospect Park and Bath Mountain settlements are on hilly terrain. The first was sold by the Company and the second by a former Member of the House of Representatives. Both are of marginal agricultural potential. Only a small proportion of the Land Settlement Schemes in Westmoreland can be cultivated economically.

(1) A Critique of Land Settlement Schemes

Before the Lands Department acquires a property, it is surveyed by a Land Valuation Officer in order to determine the price which should be asked for the lots. Roads are laid out after acquisition and the settlement is subdivided into allotments of a predetermined size. Public amenities such as roads, water and community centres should be installed before allotment to settlers but this occurs only to a very limited degree. Most of the settlements in the parish depend on springs, rivers and rainfall for

3 Ibid., p. 143.

their domestic water supply, and their transportation routes are often gravel roads of the poorest quality. There is, as a general rule, insufficient expenditure on the installation of these amenities and on soil conservation projects.

Much of the failure of land settlement in the West Indies has been due to the failure of governments to realize that a great deal of money must be spent on making land ready for settlement, and that the sum required for this purpose is often several times the sum required for buying the land. The legislation of Jamaica has conspicuously failed to recognize this; it is always willing to make grants to buy land, but makes only meagre and grudging provision of funds for putting the land into a state fit for settlement.⁴

The Camp Savannah Settlement is partly supplied with piped water. This is because of its proximity to the township of Grange Hill. Only the homes near to the main settlement have this amenity. Four other settlements visited were without piped water supply. The majority depend on stand pipes, catchment tanks and the other kinds of water supply characteristic of the parish. Their limitations were presented elsewhere.

The size of plot varies with the type. Village or housing lots were formerly about an acre. Today, they are one-third to one-half of an acre. Formerly, agricultural

⁴ W. A. Lewis, "Issues in Land Settlement Policy," <u>Caribbean Economic Review</u>, Vol. III, No. 1, 1951, p. 81. lots could be any size.⁵ For example, the average size of the agricultural lots at Bath Mountain and Prospect Park is about 3 to 5 acres.⁶

B. Land Reform Programmes

Major criticisms of the land settlement programme are that a large proportion of the allotments are of uneconomic size, settlers find it difficult to make a living on these holdings and no significant general increase in agricultural productivity is attributable to this programme.⁷ The Government recognized these limitations and proposed a programme of Land Reform as a possible solution. "No holding will be less than 5 acres in size" and a range of small farms will be created of approximately 5 - 14 acres, depending on the type and quality of the land.⁸

The cost of land and the consequent long period of indebtedness incurred by farmers who attempt to own these

5 Interview: Mr. Shaw, Lands Officer, Bath Pen, February 5, 1968.

⁶ Established from questionnaires.

7 Five-Year Independence Plan 1963-1968, p. 105.

⁸ Ibid., p. 116.

plots are major limitations to the acreage which can be made available to them. At Prospect Park and Amity Mountain, for example, the cost of an acre ranges from \$132 to \$184.80 (Canadian) (L50 to L70). Fourteen acres of less endowed, hilly land would create substantial indebtedness among marginal producers who are less efficient and as a result are less able to pay their debts.

A few factors are apparently favourable to settlers who purchase land on the settlements. They are required to make a low deposit of 5 per cent of the value of the land and subsequent payments are to be made over a twenty-five year period in yearly instalments.⁹ The long payment period should result in the lowering of the amount of yearly instalments but few people like to incur debts for half a lifetime, especially for marginal land with very limited amenities.

The new Land Reform Programme was envisaged to increase agricultural production and productivity by organizing for proper distribution of farm products and for the servicing and usage of a large proportion of those lands which are currently under-utilized.¹⁰

¹⁰ Five-Year Independence Plan 1963-1968, p. 113.

⁹ Shaw, op. cit.

(1) The Land Development and Utilization Commission

As has been shown in "the Agricultural Marketing Corporation" this Corporation is assisting in the distribution of farm products. The Land Development and Utilization Commission was charged with the acquisition of underutilized or "idle" land for development. In 1966, the Land Development and Utilization Act empowered the Commission to issue "Idle Land Orders":

An Idle Land Order tells the person who receives it that land held by him or her has been declared idle by the Commission and that plans must be submitted for the suitable development and utilization of these lands.

If the owner complies, the Commission may or may not approve of the plans. Failure to comply with the Commission's specifications could result in acquisition by the Government and allotment to people who are willing and able to develop the land.¹²

Of the 85,248 acres in Westmoreland reported to the Commission, 13,059 (15.32%) were believed to be "idle" or under-utilized.¹³ No "Idle Land Order" was known to have

11 The Gleaner Company, "The Jamaican Weekly Gleaner," Wednesday, August 30, 1967, p. 8.

12 Ibid., p. 10.

13 "Total Acreage of Agricultural Units Listed and Acreage Believed Under-utilized by Parishes--1967," Typed manuscript submitted by the Land Development and Utilization Commission. been issued in Westmoreland although property owners were notified in other parishes.

The Commission investigates units of 100 acres and over. An owner who is served an "Idle Land Order" may protest the finding of the Commission and appeal to the Minister of Agriculture and Lands. If he dislikes the decision of the Minister, settlement may be sought in the law court. This is evidently an attempt to satisfy the holder through the general democratic channels. It can, however, be disadvantageous to the land holder because of the high cost of litigation, and a Government Minister should not be expected to overrule the decision of its specialist commissioners. On the whole, the Commission offers immense potential for needed land reforms.

(2) Negril Development Project

An expenditure of £365,000 was proposed for the Negril Development Project from 1963 to 1968.¹⁴ Very little has been done to implement this programme.

A former Government started the Negril Green Island Development in 1957. Proposals were made to establish a

¹⁴ Five-Year Independence Plan 1963-1968, p. 112.

tourist resort and reclaim the Great Morass and other neighbouring swamps. As previously stated, the People's National Party lost power after completion of some first class main roads in the area and before the reclamation of the swamps was completed. The five and one-half miles of resort potential on the shoreline, the approximately 4,500 acres of fertile alluvial soils, and the flood problem have already been described. (See Map 10.).

There are about twenty privately constructed beach cottages in the area. A few employees who maintain canals and roads, and a field officer are the chief employees at present. This is a mere skeleton of the potential revenue and employment that can be provided by the project if completed.

Because of pressure groups in the Montego Bay and other north=shore tourist centres, and partly because of a near-sighted Government policy, one of the most beautiful tourist centres of the West Indies is underdeveloped. This project, if completed, would stimulate the economy of Westmoreland and Hanover by increasing employment and the local demand for agricultural products.





(3) Fish Farming

The Government's fisheries programme is executed through the Fisheries Division of the Ministry of Agriculture and Lands, whose activities embrace both marine fisheries and inland fisheries.15

Our immediate concern is the inland fisheries of Westmoreland. The objective of the fisheries' programme is to reduce Jamaica's importation of fish and fish products and to improve the protein diet of the local population. In 1962, the value of imported fish and fish products exceeded \$5,860,000 (E2 million).¹⁶ The necessity of reducing this figure is evident.

African perch (<u>Tilapia mossambica</u>), the main fresh water fish bred, were introduced by the Fisheries Division from Saint Lucia about 1950. This species was selected because it reproduces easily and rapidly and does not require any expensive hatchery equipment. In addition, it is a robust fish with a marked heat tolerance and can survive in relatively low oxygen concentrations. It can, therefore, be transferred in simple equipment over long distances with relatively little mortality.

15 Ibid., p. 100.

¹⁶ The average exchange value of the L was \$2.93 (Canadian) approximately in 1962. <u>Tilapia mossambica</u> is a warm water fish which thrives in water with a temperature from 20°C to 35°C. Colder water usually proves fatal. Its growth and reproduction are retarded in above 38° temperatures. It can tolerate salinity of up to 30 parts of salt per 1000 parts of water. In higher salinities, its growth is satisfactory but it does not reproduce.

These fish reach maturity in nine months to a year under satisfactory culture conditions. If the pond is stocked and managed well, each fish should weigh about one pound. Understocking of ponds and tanks may increase the rate of growth. Conversely, overstocking will lead to slower growth.

A mono-sex culture is practised by the Fisheries Division. Under the mono-culture system, one sex of the African Perch is used to stock each pond in order to prevent the accumulation of a large fish population which would eventually reduce the size per capita because of competition for the limited supply of food.

Westmoreland contains ponds and tanks totalling approximately 26.5 acres on some thirty-four holdings which are stocked with African Perch. The ponds range from 0.1 of an acre to about seven acres in size. Ponds are stocked at the rate of 1000 fingerlings per acre. On the basis of

1000 pounds per acre, it is estimated that 26,500 pounds of fish are harvested annually in the parish.17

No definite policy is followed in the marketing of fresh-water fish in Westmoreland. Private farms are stocked to supplement the protein diet of the property owner and his family.

There are a few regulations defining the types of traps and nets to be used in order to prevent the harvesting of fish which are too small or too young. Reaping generally takes place a year after each pond is stocked. It would appear that more supervision is required but it could prove to be uneconomical and impractical to supervise small units on private farms.

The Government's breeding and experimental section of the Fisheries Division is at Twickenham Park, Clarendon. Fingerlings are transported from Twickenham Park as they are requested by farmers.

(4) Farm Machinery Pools

The Agricultural Development Corporation operates Farm

¹⁷ Interview and handwritten answers to questionnaire submitted on request by K. D. Brown, B.Sc., Fisheries Officer, Ministry of Agriculture and Lands, Fisheries Division, Kingston, February 8, 1968.

Machinery Pools set up by the Ministry of Agriculture and Lands to provide tillage for farmers owning less than 100 acres.¹⁸ One of the Pools is at Camp Savannah. It has been shown that the Pools provide tillage at a cost of approximately 20 per cent less than private individuals and that medium farmers appear to benefit most from this scheme. (See "New Sugar."). One crawler and two wheeled tractors, a pickup truck and "lowboy" trailer are owned by the Corporation in Westmoreland.¹⁹ This equipment is inadequate to meet the demand for tillage. Two of the six farmers interviewed complained that the wheeled tractor used to till their land performed inefficiently. It broke down, tilled improperly, and resulted in loss of time. Other farmers who hired the D6 crawler tractor were satisfied with its performance. A number of property owners had to wait too long before obtaining the service of a tractor. Some farmers were forced to cancel applications when tractors were supplied too late. Table 14 shows that the Corporation supplied an average of 29.2 per cent of the demand for tillage which it was requested to supply from April 1, 1964

¹⁸ The Government of Jamaica, <u>Economic Survey</u> Jamaica 1964, p. 48.

19 Agricultural Development Corporation Fourth Annual Report and Statement of Account for Year Ending <u>31st March, 1966</u>. (Kingston, Jamaica: The Jamaica Times (Press) Ltd.), p. 20.

TABLE 14

TILLAGE COMPLETED BY THE FARM MACHINERY POOLS IN WESTMORELAND APRIL 1, 1964--MARCH 31, 1967

Period, total and average	Acreage for which applications were made	Acreage completed of farm machinery pools	Acreage completed as percentage of acreage applied for
1/4/64 - 31/3/65	1,187	338	28.5
1/4/65 = 31/3/66	1,378	335	24.3
1/4/66 - 31/3/67	166	364	36.7
Total	3 ª 556	1,037	89 . 5
Average	1,185.3	345.7	29.2

to March 31, 1967.²⁰

It is evident that the demand for tillage can be met by providing more efficient D6 crawler tractors and by accelerating the processing of applications. The agricultural officers and area officers who process applications are apparently unable to complete them on time because of government red tape procedures and because more extension officers are needed.

As previously mentioned, the Agricultural Development Corporation purchases and mills farmers' rice. The factory's productive capacity is under-utilized because it is not supplied with sufficient rice. In 1966, for example, only 900 tons were milled although its milling capacity is 10,000 tons annually. It operates for approximately four months yearly. The Corporation must buy all the local paddy which is offered. Milled rice is supplied to the Trade Administrator for local distribution.²¹

This "...Corporation was established in 1952 to stimulate, facilitate and undertake the development of agriculture in the island."²² It performs other activities

22 Five-Year Independence Plan 1963-1968, p. 98.

²⁰ Interview: A. C. Robinson, Agricultural Development Corporation, Farm Machinery Pools Supervisor, Spanish Town, August 4, 1967. Percentage calculations and assessment are made by the author.

²¹ Interview: R. A. Sharpe, Manager Agricultural Development Corporation Rice Plant, Spanish Town, August 4, 1967.

such as swamp reclamation, provides credit facilities to farmers, and engaged in the experimental production of selected crops. None of these activities are known to be occurring in Westmoreland under the sponsorship of the Corporation. Its milling and machinery programmes offer some potential for improved tillage and rice productivity.

(5) Agricultural Education

Provision is made by the Government for agricultural education of youths and farmers. The main institutions and media through which agricultural knowledge is disseminated are the Jamaica School of Agriculture, the Extension Services, the Jamaica Agricultural Society, 4-H Clubs, Farmers' Training Centres, and Rural Technical Schools.

(a) Agricultural Educational Institutions

Jamaica's chief agricultural institution is the Jamaica School of Agriculture. This institution provides theoretical and practical training in agriculture for three years to a level which is equivalent to the first year at American and Canadian colleges. It supplies the majority of the agricultural officers for the Ministry of Agriculture and Lands. A number of its graduates further their studies overseas at agricultural institutions. Students of the Jamaica School of Agriculture are drawn from various parts of the island. Three or four of them are Extension Service Officers in Westmoreland.

Rural Technical Schools provide agricultural, home economics and other forms of training to adolescents. Some centres are co-educational. Knockalva Rural Technical School in Hanover is the nearest centre to Westmoreland. As a result, most of the students who obtain agricultural training from Westmoreland tend to start at that centre. A few others attend Homewood and Dint Hill Rural Technical Schools. These Rural Technical Schools serve chiefly as initial training centres leading to qualification in the Jamaica School of Agriculture. Formerly, the more successful students from these centres could obtain employment in related areas on the Estates, but this opportunity has been reduced significantly as demand for training increases.

Teacher training institutions and elementary schools once emphasized the rudiments of agriculture as part of their programme. This is no longer a compulsory extracurricular activity in teacher training. A few of the older pedagogues still maintain the school garden plots which provide some elementary training in farming and

supplement the principal's income.

(b) The Extension Services

Many bodies and agencies disseminate practical and theoretical agricultural knowledge. These are classified as the extension services. They perform some tasks which fall within the portfolio of the Ministry of Agriculture and Lands.

This Ministry maintains an Extension Service Branch in Savanna-la-Mar which functions independently and collaborates with the above organizations to educate farmers. Since 1963, a number of Farmers' Training Centres have been established for the extension staff to use in order to provide short, intensive courses in the husbandry of particular crops. None of these centres is in Westmoreland but some of the farmers interviewed were getting ready to attend one of these courses in April, 1968. The farmers' board and transportation costs are subsidized by the Government.

The general objectives of the Ministry of Agriculture and Lands Extension Service are

to assist the people of Jamaica, particularly the farming community, to analyze and solve their problems, to develop desirable attitudes, to

improve and increase their knowledge, to develop their skills and to utilize the available human and physical resources for their economic, social and cultural development.²³

Attempts on the part of the Westmoreland Extension Branch to improve and increase farmers' knowledge include field days, farm visits, meetings and agricultural shows organized and conducted by its members in conjunction with the other organizations listed. Table 15 indicates the extent of participation by the extension services in some educational activities among farmers in 1964.²⁴

Other extension activities are the implementation of the Farmers' Production Programme and the dissemination of agricultural information through public communication media such as radio, newspapers, television and circulars. Communication with the public is organized by the Public Relations Branch of the Ministry in Kingston and through the publications of the Jamaica Agricultural Society, but some aspects of the Farmers' Production Programme are implemented by extension officers in Westmoreland.

23 Ministry of Agriculture and Lands, <u>Programme of</u> the Agricultural Extension Service 1965-1970 and Targets 1965-1966, p. 1.

²⁴ Ministry of Agriculture and Lands Extension Service, Westmoreland, <u>Annual Report 1964</u>, p. 8.
TABLE 15

SELECTED EXTENSION ACTIVITIES, WESTMORELAND, 1964

Items	Number
Jamaica Agricultural Society and 4-H Club meetings	103
Number of farm visits	2,450
Farmers' field days	7
Training days (for members of 4-H Clubs)	26
Staff conferences	58
Agricultural shows	2
Other meetings	103

The Agricultural Extension Services are divided into sections, an Advisory Service providing technical guidance and advisory services to the farmers, and a Development section administering such schemes as the Farmers' Production Programme.²⁵

25 The Government of Jamaica, <u>Economic Survey</u> Jamaica 1964, p. 47.

(6) The Farmers' Production Programme

This Programme attempts to secure a rapid increase in agricultural productivity, the efficient use of cultivable land, and an improvement in rural economy and the standard of living of the rural population of Jamaica. One of the proposed methods of achieving the above objectives is the introduction and intensification of agricultural education at all levels of the education system.²⁶

In Westmoreland, the Programme was launched at the following centres: Savanna-la-Mar, Little London, Seaford Town, Haddo, William's Field, Bog, Grange Hill and White House.²⁷ Extension officers advise farmers how to qualify for loans and subsidies under the Programme. They advise on the construction of farm buildings such as piggeries, poultry and dairy sheds, and how to improve their water supply and crop acreage. Other benefits received under this Programme are farm housing, plants such as cocoa, coffee, coconuts, citrus, timber and pimento, and the services of pedigree sires for their cows under the Loan Bull Scheme.²⁸

²⁶ <u>Five-Year Independence Plan 1963-1968</u>, p. 89.

27 The Ministry of Agriculture..., <u>Annual Report</u> 1963, p. 14.

²⁸ <u>Ibid</u>., 1966/67, pp. 6-7.

Agricultural officers process applications and advise farmers how to obtain maximum benefit from these facilities.

2. SOCIAL BODIES INFLUENCING AGRICULTURE

The following bodies which influence agriculture function as governmental, private and social agencies:

A. The Jamaica Agricultural Society

As an extension service, the Jamaica Agricultural Society provides educational, marketing, distributive and social functions for the farmers. The Society has a long history of performance and achievement in Jamaica. In its initial stage of development in 1895, it was named the Society of Agriculture. It was formed

...to collect and to spread useful information, encourage the improved cultivation of products and better breeds of stock and to watch over the interests of the agricultural industry generally.²⁹

It has continued to provide a wide range of services to the island.

In 1966, there were sixty-six branches of the Society

29 Clyde Hoyte, <u>History of the Jamaica Agricultural</u> Society 1895 to 1960 (Kingston, Ja.: City Printer, Ltd.,), p. 9. in Westmoreland, with a total membership of 5,389, 14 affiliated members and a paid-up membership of 253.³⁰ Its function as a marketing agent has been described previously. (See Marketing.) The Darliston Coffee Co-operative and Cattle Insurance Co-operative Societies are other group activities promoted by the Society. The Darliston Coffee Co-operative Society has 13 active groups and 395 coffee growers.³¹ Members obtain subsidized N.P.K. and Sulphate of Ammonia through the Coffee Fertilizer Scheme.³²

The Jamaica Agricultural Society's Cattle Insurance Co-operative Society supplies credit to members and insures their cattle. Credit is currently given for cattle purchases to a maximum of \$184.80 (Canadian) or £70 per animal to a limit of ten animals for each farmer. Proposals have been made to the Government to increase the role of the Jamaica Agricultural Society in providing credit for dairy farming by permitting it to make loans for equipment and buildings, and for the removal of the credit maximum.33

³⁰ Journal of the Jamaica Agricultural Society, "Organization and Marketing," <u>The Farmer</u>, November to December 1966, Vol. LXXI, Nos. 11-12, p. 248. (Article in Journal of the J.A.S. No author is listed.).

31 Interview: A. May, Project Officer, Savanna-la-Mar, June 20, 1967.

³² Journal of the Jamaica Agricultural Society, op. <u>cit.</u>, Nov.-Dec. 1966, Vol. LXXI, Nos. 11-12, p. 250.

33 Ibid., p. 244.

Other activities of the Society are the establishment of a Farm Supply Store in Savanna-la-Mar which sells seeds, farm equipment, and various agricultural publica-The Society's Journal, The Farmer, and a book, tions. The Farmers' Guide, are very informative publications. Its many other publications, circulars and bulletins also provide farmers with current agricultural information and guidance. However, the price of \$5.28 (Canadian) or L2 for The Farmers' Guide is too high for peasant farmers. Consequently, they lose the service of one of the most valuable sources of agricultural information in Jamaica. The Society appears to be more successful as an educational medium through the direct contacts of its officers with the farmers at meetings and on training days. It is not as successful in Westmoreland as the statistics on membership would seem to suggest.

The parish was eighth of fifteen membership groups and fifteenth (last) in the number of paid-up members. Financial members are the main support of these branches and the average of approximately four financial supporters per branch suggests that these are chiefly the officers of the branches. This number is small since there are thousands of farmers. The interview revealed that many members attended a couple of meetings during the initial formation

of branches but never returned. Sixteen of ninety farmers interviewed joined the Society. Twelve obtained seeds, received training, and in a few cases benefited from marketing services. A few were disgruntled because promises of seedlings and other farm assistance were unfulfilled. Branches were active at Bleauwarie and Townhead but the farmers in some other areas showed little interest in the branches, which seemed dormant. The Society is fairly active in Jamaica as a whole but the farmers of Westmoreland need to participate more actively in its programmes. Formerly, the annual Frome Agricultural Show, partly promoted by the Society, was a stimulus to agriculture in the western parishes. Its discontinuance is probably one of the factors contributing to the apparently declining influence of the Jamaica Agricultural Society in Westmore-The Society is valuable to the farming community as land. a whole. It makes representations to the Government on behalf of farmers, and should be supported because of its many uses.

B. 4-H Clubs

4-H Clubs provide leadership, social, agricultural and home economics training to girls and boys of 10 to 21

years. In 1965 there were 35 clubs in Westmoreland with a membership of 1,423 - 541 boys and 882 girls.³⁴ Club members are taught farming skills such as cattle judging, animal and plant husbandry, budding and grafting, banana spraying, and the operation and care of farm machinery. The female members are taught to cook, preserve foods, and arts and crafts connected with the home. The boys practice arts and crafts of importance to home and farm, for example, basic carpentry. Public speaking and social values such as thrift, courtesy and sportsmanship are encouraged.

Adults, especially female teachers, give voluntary guidance. Efforts to obtain leadership from farmers, artisans, housewives and businessmen are progressing slowly.³⁵ Projects such as gardening and animal rearing are promoted by 4-H Clubs³⁶ and organized and supervised by the organizer for the parish, volunteer workers and senior Club members. Club members compete at parish Achievement Days to represent Westmoreland in National

34 4-H Clubs Twenty-fifth Annual Report April 1, 1964-March 31, 1965 (Kingston, Jamaica: The Herald, Ltd., Printers), Schedule VI.

35 Ibid., p. 3.

³⁶ The Jamaica Agricultural Society, <u>Jamaica 4-H</u> <u>Projects Leaders' Guide</u> (Kingston, Jamaica: Jamaica Agricultural Society Central Information Service), pp. 5-9.

Achievement exercises annually at Denbigh, in Clarendon. The prizes, trophies, publicity and social contacts are important aspects of the effect of agriculture on the community at these exhibitions. The International Cattle Judging competition is of particular significance. It gives local clubs a chance to compete with some of the best in the world, to visit foreign countries and to meet Puerto Ricans and Canadians in Jamaica. A number of Westmorelanders have performed well in this event.

The trend is toward a decline in 4-H Club membership and on the influence of the movement in Westmoreland. The Clubs had decreased by 8 and the membership reduced by 26.2% (504 members) from 1963 to 1965.³⁷ One problem is that the work load associated with approximately 1,500 members in 35 clubs is too high for one organizer.³⁸

C. The Jamaica Livestock Association

The Jamaica Livestock Association is privately owned and operated. Its main purpose is to promote livestock production by supplying feed to farmers. Feed is

37 4-H Clubs...1965, Calculated from Schedules VI and VI(a).

38 Ibid., p. 3.

supplied at rates lower than that obtainable on the retail market. The Association tries to prevent merchants from charging exhorbitant prices for feed by purchasing Purina Chows³⁹ directly from the producer and supplying them to farmers. It makes representation to the Government for livestock producers and distributed feed supplied by the Government to farmers during the severe drought of 1967.⁴⁰

D. The All-Island Banana Growers' Association

As an agency of the Banana Board, the All-Island Banana Growers' Association functions to promote the proper and efficient production of bananas and to administer the programmes assigned by the Board. The Association is subsidized by the Government and operates in ten divisions or Banana Areas in Jamaica.

Its Western Division, including Westmoreland, is divided into four sections or district branches which disseminate information at meetings and by circulars and

⁴⁰ Interview: R. F. Williams, Retired Chairman of the Jamaica Livestock Association, Enfield, February 4, 1968.

³⁹ Journal of the Jamaica..., <u>The Farmer</u>, Vol. LXX, No. 6, June 1965, p. 143. (Purina Chows are manufactured by Jamaica Feeds Limited, Kingston, Jamaica. They are poultry, cattle and hog rations which are obtainable at farmers¹ stores.)

bulletins to farmers. Farmers apply via the local branch supervisor for fertilizer under the Fertilizer Credit Scheme or for subsidies and banana insurance under the appropriate schemes. Fertilizer is recommended according to the established needs of each farmer. The amount and kind of fertilizer varies with the soil deficiency, the crop requirement, and the acreage under cultivation. It should only be applied after advice of an expert who has tested the soil.

The spraying of banana plants with fungicides to control Leaf Spot (<u>Musicola mycospaerella</u>) is supervised by the Association. At present the Banana Board employs contractors who spray by aircraft. Oil base sprays are utilized. Formerly, Bordeaux or copper sulphate spray was popular.⁴¹ It is still used by farmers with small acreages outside of the main banana areas. Banana producers contribute towards the spraying service and insurance benefits by a cess which is collected when bananas are sold to the Board. Loans are made under the Banana Rehabilitation and Expansion schemes. Farmers who are planting or re-planting bananas to a maximum of five acres qualify for this type

41 The writer represented Westmoreland at two 4-H National Achievement exercises in the spraying of banana plants with Bordeaux mixture.

of credit.42

The farmers of Seaford Town and neighbouring districts obtain the above benefits. The active Association branch in the area gives advice to farmers, administers the Government schemes, makes recommendations for the development of the industry and progress reports to the Banana Board.⁴³

E. The All-Island Jamaica Cane Farmers' Association

Historically, the All-Island Jamaica Farmers' Association is the junior of the Westend Cane Farmers' Association. The former was formed in 1941 and the latter in 1938. Today, the All-Island Cane Farmers' Association is the senior partner which represents all registered cane farmers and is the central body, with its head office in Kingston. Its objectives are to foster, promote and encourage the growing of sugar cane and its orderly and proper delivery to the factories, to settle disputes between members and factories, and to negotiate on behalf of

42 The Government of Jamaica, <u>Economic Survey</u> Jamaica <u>1964</u>, p. 59.

43 Interview: The All-Island Banana Growers: Association Supervisor, Seaford Town, February 10, 1968.

members. Another aim is the settlement of disputes which may arise among members and between cane farmers and the branch associations.⁴⁴

The branch in Savanna-la-Mar is the Westend Cane Farmers' Association. It disseminates information and notices from the senior body to farmers, receives and expends money as directed, and brings to the knowledge of the All-Island Association any failure to reach satisfactory arrangements with the Frome factory. This branch serves the sugar cane farmers of Westmoreland by providing a number of field workers, a chemist, and organizers who maintain liason between the Frome Estate, the registered The function of the cane farmers and the Association. chemist, stationed at Frome, is to test and establish the sucrose content and other chemical aspects of farmers' cane delivered to the factory. His role is of great importance since the payment to farmers partly depends on the sucrose content of their cane.45

There were nine permanent reporting chemists and seven crop-time chemists employed by the All-Island Association in 1967 in Jamaica. During the after-crop (harvest)

44 The All-Island Jamaica Cane Farmers' Association, Twenty-sixth Annual Report 1967, Appendix I.

45 Interview: Mr. Slowley, Secretary, Westend Cane Farmers' Association, February 7, 1968.

period, full time chemists are employed in sampling and analysis of soil and cane leaves and in assisting with the compilation of data for the Chemistry and Fertilizer Departments.46

At Frome, a number of scrutineers ascertain that sugar manufacturing is in accordance with the specifications of the Sugar Control Law. The immediate concern of the branch association is representation to management in the interest of its members and the sugar industry.

Two Field Managers of the All-Island Association supervise its Field and Organizational Department in Jamaica. The island is divided into a Northern and a Sourthern Section. Westmoreland is supervised by the Field Manager in charge of the Southern Section with headquarters at Four Paths in Clarendon.⁴⁷

Sixteen Group Leaders serve in Westmoreland as advisors to cane farmers in methods of cultivation, the use of fertilizer and other cultural practices. They discuss grievances of farmers with the Association and factory management. Fertilizers are sold to registered cane farmers through the Association at a reduced price.⁴⁸

46 The All-Island...., <u>Twenty-sixth Annual Report</u>, 1967, p. 26. 47 <u>Ibid</u>., p. 22. 48 Interview: Mr. Slowley, <u>op</u>. <u>cit</u>.

Farmers contribute 6d. (approximately 10¢ Canadian) per ton of cane delivered towards a Fertilizer Cess Fund.⁴⁹ This is withdrawn at the Factory from the payment for each farmer's delivery.

In 1967, the All-Island Jamaica Cane Farmers prepared and presented evidence to the Mordecai Commission of Enquiry into the sugar industry. Mr. V. V. Elliott, the then Technical Advisor to the Association, gave oral evidence before the Commission.⁵⁰

It is evident from the above examples that guidance and representation are not lacking to sugar cane farmers.

F. <u>Research</u>

This study of the cultural and socio-economic factors influencing agriculture would be incomplete without some indications of the research facilities made available to farmers by the Government and private bodies. The chief areas of research are plant propagation, experimentation with livestock, and the control of pests, diseases and fungi. The Government's research in fisheries has

49 The All-Island Jamaica Cane..., <u>Twenty-sixth</u> Annual Report 1967, Table X.

⁵⁰ Ibid., p. 26.

Agricultural research is conducted chiefly by the Jamaica Government, the University of the West Indies, and the sugar estates. The Ministry of Agriculture and Lands conducts research for the development of more productive crop and animal varieties, effective control of diseases and pests, better application of fertilizers and ultimately higher yields. Formerly, Jamaican agricultural research was centred on the problems of the export industries such as sugar and bananas. Consequently, little work was done on crops such as yams (Dioscorea), sweet potatoes (Ipomoea batata) and pineapple (Ananas comosus). As a result, farmers bore heavy losses because of pests and diseases which they could not control for little was known about them. In many cases, the methods of cultivation used by farmers were unsatisfactory because the available information on these crops was inadequate. A new emphasis is on the production of the above and other local food crops such as Congo or Gungo peas (Cajanus cajan), red peas or string beans (Phaseolus vulgaris) and Irish potatoes (Solanum tuberosum). The Department recommends Darliston for the cultivation of sweet and Irish potatoes. It has established levels of fertilizer applications

appropriate to each area and soil type in Jamaica.⁵¹

(a) Plant Propagation

Red peas (<u>Phaseolus vulgaris</u>) are in short supply in Jamaica and efforts are being made by the Ministry's agronomists to select local varieties which seem promising. It is also hoped that the Regional Research Centre in Trinidad will develop a new variety that is adaptable to Jamaican conditions. Local farmers are unaccustomed to the spraying of red peas although plants may be affected by the Bacteria Leaf Blight which is easily controllable by spraying once every ten days with Cupravit or Maneb M 45.⁵²

Much study of Gungo peas (<u>Cajanua cajan</u>) is taking place partly because it is in great demand locally. One of the varieties, the so-called "October Gungo" because it is harvested in that month, is being studied. The accent seemed to be on the time this crop is ready for harvest as well as its resistance to disease, and its yield. A dwarf variety which is said to yield three crops

51 Journal of the Jamaica Agricultural Society, <u>The Farmer</u>, January-February 1967, Vol. LXXII, Nos. 1-2, pp. 29-32.

 5^2 <u>Ibid.</u>, p. 31. The amount of the mixture per acre to be applied was not given in the source.

each year, in October, December and March, has been produced at the Regional Research Centre in Trinidad. This, it is anticipated, will be distributed in Jamaica when an adequate supply of seed is available. Four varieties of Gungo peas are currently being propagated for distribution to Jamaican farmers.

What promises to be one of the greatest achievements in agricultural research in Jamaica is being conducted in the pimento industry. The problem of distinguishing between male and female pimento (<u>Pimenta officinalis</u>) trees and the high proportion of "barrenness" associated with the industry were previously discussed in "Pimento."

...A stage has been reached where it is possible to produce, by grafting, either sex at will, and therefore to regulate the proportion of male and female trees in a grove.53

Dr. Chapman, of the University of the West Indies Botany Department, began pimento research on behalf of the Ministry of Agriculture and Lands about 1962. He is credited for most of the current discoveries in the industry. Two male and two female varieties have been isolated and are being tested, and other varieties are being propagated for testing. The ME 14 variety has been reported to give the

53 Journal of the Jamaica Agricultural Society, op. cit., July-August 1966, Vol. LXXI, Nos. 7-8, p. 169.

highest yield over a ten-year period of any pimento tree. A dwarf variety has given some indication that it is a good producer and will increase the density per acre by reducing the planting distance from 20 to 12 or 13 feet. Pimento varieties which have the potential of increasing the yield and of reducing the space seem to offer much hope for increased productivity. In addition, spraying and reaping operations would be made much easier with the shorter than with the taller trees. 5^{4} Dr. Chapman suggested that productivity should be increased per tree but production should be limited within the amount the market will absorb by restricting the acreage under pimento cultivation. The objective behind the restriction would be to prevent a ruinous fall in prices because of overproduction. With proper cultural practices, the Jamaican pimento farmer should become more successful when the new plants are supplied to the public.

Reference was previously made to the research of the Sugar Manufacturers' Association in the study of fertilizer application, the effect of variation in water table on sugar cane (<u>Saccharum officinarum</u>), the influence of spacing and the use of herbicides and insecticides.

⁵⁴ Pimento normally attain heights of 20 to 30 feet and some trees exceed 40 feet. (See Ward, <u>op. cit.</u>, p. 3).

(See Planting and Care.) Useful knowledge resulting from research is disseminated to farmers via the cultural bodies discussed in the above paragraphs.

(b) Experimentation with Livestock

The role of the West Indies Sugar Company in cattle breeding has been discussed. Other private bodies such as Alcan and Reynolds Bauxite Company appear to undertake livestock research which may contribute to knowledge of livestock in Jamaica, but the studies of the Government at Bodles and Grove Place livestock stations are the most beneficial to farmers. Selective breeding, experimentation in the control of pests and diseases of livestock, scientific management practices and production of animals more suitable to Jamaica's physical conditions are ways in which the Government contributes to livestock production. In the past, cattle have been emphasized by researchers in the island but pigs and poultry are currently given more emphasis than formerly.

3. TRADE UNIONISM

Trade unionism, at Frome as in other parts of Jamaica, developed from labour discontent and disturbances. Wages were generally low and working hours were long. In 1938, skilled labour earned a minimum wage of 2/-3d. to 3/-6d. per day and unskilled 1/-9d. to 2/-3d. Labour was required to work 9 hours and 45 minutes for this wage.⁵⁵ As a result of low wages, insufficient employment and dissatisfaction, a riot occurred at Frome in that year and the Bustamante Industrial Trade Union began to organize the workers of Westmoreland. Subsequently, the National Workers' Union joined in the organization and representation of employees.

These unions have made major contributions in the settlement of disputes between employers and employees, increasing of wages, reduction of working hours to the 8-hour day, and the improvement of working conditions. They fix the rates for tasks in agriculture, provide sick

⁵⁵ Report of the Commission appointed to enquire into the Disturbances which occurred on Frome Estate in Westmoreland on 2nd May, 1938 (Kingston, Jamaica: Government Printing Office, 1938.) It is realized that the purchasing power of money was much greater then than it is today. This would tend to compensate for low wages but working conditions were very poor.

benefits to members and contribute to increased productivity and better standards of living by their reforms. Both unions are connected with the major political parties. Consequently, they institute labour policies which are generally in the national interest. The most recent influence of the unions, the increasing of the minimum wage rates paid to employees at Frome, has been previously discussed. These rates often force other employers of the parish to increase wages in a similar manner where the employment is the same.

The Government has envisaged a Fair Labour Code which will define modes of industrial conduct for employers, employees and their respective organizations in Jamaica. The Code will also establish minimum wage machinery which will include all aspects of labour.⁵⁶ When this is established, the unions, it is hoped, will continue to provide useful service to the community.

4. CRITICISMS

This subdivision includes a summary of the cultural and socio-economic factors influencing agriculture and criticisms of the role of government, social and economic

⁵⁶ Five-Year Independence Plan 1963-1968, pp. 172-173.

agencies.

The available resources for agricultural research in Jamaica are limited. Consequently, it may be necessary to supplement the experimental work at research stations with surveys of the effects of practices on farms. This approach may be advantageous in supplying results which are applicable to farms of similar characteristics to those studied. When results are of small magnitude they could be useful in the discouragement of improper methods.

Economic studies of farm organization and management have been neglected. Because of this neglect, some of the major economic problems have been under-emphasized and extension officers and other advisors of farmers almost exclusively emphasize technical problems.

The approach whereby information is passed on to individual farmers needs revision. This is particularly essential when dealing with innovations. The community may discourage or encourage the introduction of innovations, therefore its support should be enlisted. If groups of farmers, including the informal local leaders can be persuaded to approve innovations, the prospects for their popular implementation would be greatly enhanced since other farmers are likely to adopt their methods.⁵⁷

57 Edwards, op. cit., pp. 263-264.

Lack of capital is the major limitation to the extension of the influence of the bodies discussed. This is reflected in the shortage of organizers of 4-H Clubs, limited agricultural research, the inadequate supply of Government and other extension officers, and in the optimum unit which small farmers can normally be expected to purchase in the land settlement schemes.

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It has been shown that many organizations influence agriculture mainly by providing assistance to farmers such as guidance, education, markets, representation, seeds and fertilizers, (The Jamaica Agricultural Society and the Agricultural Marketing Corporation). The Government has the greatest effect on agriculture. Its effectiveness or ineffectiveness in agricultural pursuits often determines the success or failure of important projects. These associations, organizations and the Government will, it is believed, continue to give leadership to the agricultural Their future effectiveness will depend on Jamaica's sector. ability to deal with its population, land tenure, education and other cultural and socio-economic problems. The powers granted by legislation to the Land Development and Utilization Commission, if shrewdly enforced, offer much potential for modifying the unequal distribution of land

and in making more acreage available for utilization. Generally, the cultural institutions are seriously concerned with the improvement of agriculture.

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CHAPTER VIII

PROBLEMS AND SOLUTIONS

Reference was previously made (see "Mechanization on the Frome Estate," "Rice," "The Banana Board," "Domestic Markets") to labour problems and possible solutions of them in plantation agriculture, the economics of rice production, labour and economic development, a problem of the banana industry and marketing criticisms, which were postponed for present discussion. Other topics to be discussed are population pressure on the land, capital and credit availability, praedial larceny and soil conservation. The discussion will include critical analyses of solutions attempted by the Government. Suggestions will be made for their improvement.

1. LABOUR PROBLEMS AND POSSIBLE SOLUTIONS IN PLANTATION AGRICULTURE

Labour supply was of prime concern to the Jamaican planter and to many other sugar colonies in the second half of the nineteenth century. The difficulties of the sugar industry were attributed to shortage of labour. Planters believed that the "orderly well-behaved old slave folks" were dying out and "being replaced by lazy vagabonds" who only worked a few days in August and at Christmas.

J. Bigelow, writing in 1851, attributed the depression in the sugar industry to the

degraded estimate placed on every species of agricultural labour by the white population... a pernicious effect and an enervating example to the blacks.¹

It is evident that there was a deep-seated aversion to work on the sugar estates which was identified with slavery but there were also other reasons.

Jamaican planters never paid a wage to attract negro labourers, and on the slightest pretext of economic difficulty were prone to reduce wages. During the period of disturbances in 1864-5, during Governor Eyre's term of office, planters reduced wages from 1s. 3d. to 1s. per day and increased tasks in the mill enlarging syphons and pans; "only 7-9 could be done compared to 9-12."²

The planters of that time defended their policy with the fallacious argument that they were forcing the negro to work harder to attain the minimum subsistence existence which

1 R. W. Beachey, The British West Indies Sugar Industry in the Late 19th Century (Oxford: Basil Blackwell, 1957), p. 99.

2 Ibid., pp. 105-106. s = shillings (English pound sterling) d = pence or pennies 1/3d = 17¢ (Canadian) 1/- = 13¢ (Canadian) he desired. They believed that negroes would work only sufficiently to obtain the bare necessities of life.

Unoccupied land on which squatters could settle and which was often ten miles from the factory also added to the labour problem. This was aggravated by a coincidence. The January to May provision-planting season coincided with the planting period of the factory. Employees were forced to forego employment on the estates for the independence which subsistence agriculture offered them.

Many of these factors are considerably modified in the twentieth century. However, apparent traces remain to plague the present sugar estate. As was shown in "attitude to manual work," many Westmorelanders still possess an aversion to unmechanized agricultural labour and factory work. Cane cutting and loading are major problem areas in the sugar industry throughout Jamaica. Harvests are prolonged and cane spoiled because cutters and loaders refuse to work. This has become an annual problem.

Increased rates have been given, particularly in the loading sector, but this has not yet proven to be the answer to the problem.³

Increased mechanization is an apparent solution but this method has economic and social ramifications which

³ The All-Island Jamaica Cane Farmers Association, Twenty-sixth Annual Report 1967, p. 9.

cannot be ignored. Employees are displaced whose prospects for future employment are almost non-existent.

At Frome, 113 loaders and 1 ticket distributor were given notice of redundancy because of the introduction of mechanical cane loaders during the 1965-66 harvest. Another 120 factory workers were also displaced during that period, as a result of installations in the factory.⁴ Since more machines are being employed especially for cane loading and pasture care, unemployment of more men can be anticipated.

The employees' problems are evident. They lose their five or six months cash income and are forced to support their families on subsistence farms at reduced standards of living.

On the other hand, employers are on the horns of a dilemma. They must remain competitive, attempt to reduce the cost of production, solve the labour shortage, and satisfy governments which propaganidize against mechanization.

The problem may be intensified because there is no defined government policy in Jamaica on mechanization. While the political parties propagandize against machines,

⁴ The West Indies Sugar Co. Ltd., <u>Annual Report</u> 1966, p. 2. the factories are forced to mechanize increasingly.

Jamaica's Prime Minister showed some awareness of the problem when in April 1963 he appealed to the All-Island Cane Farmers' Association and the Sugar Manufacturers' Association to contribute \$752,500 (L250,000) from the additional income expected from the high world prices for sugar towards a Redundancy Fund for workers displaced by mechanization.⁵ This contribution was to be made for severance pay to workers from the field, shipping operations or factory, who would not qualify under the Sugar The Sugar Manufacturers' Associa-Workers' Pension Scheme. tion's total donations in 1963 and 1964 were \$1,034,540 (L346,000) but the All-Island Jamaica Cane Farmers' Association has made no known contribution to date. At the end of 1965 the deposit in the fund remained at \$1,034,540 (Canadian).6

⁶ Central Planning Unit, <u>Economic Survey Jamaica</u> <u>1965</u> (Kingston, Jamaica: The Government Printery, April 1966), p. 49. One pound (L) had an average exchange value of approximately \$2.99 (Canadian in 1964 and 1965).

⁵ Central Planning Unit, <u>Economic Survey Jamaica</u> <u>1964</u> (Kingston, Jamaica: Government Printery, April 1965, p. 53. The average exchange value of the L in 1963 was approximately \$3.01 (Canadian) as established from Dominion Bureau of Statistics, <u>Op. cit.</u>, p. 234. This and all subsequent exchange values of the L were obtained from the table on p. 234 if no acknowledgment is made otherwise.

A dynamic policy is urgently required to fix a ceiling on the level of mechanization that is beneficial to the economy as a whole. A solicitous policy is unable to provide adequate compensation for the numerous workers who are being displaced throughout the island. The severance pay of less than \$264 (El00) in some cases and \$316.80 (El20) in one of the examples interviewed is inadequate. This is serious for many of these employees have families to support and almost no chance of obtaining future employment.

An assessment is required of the extent to which the country can afford economically and socially to increase the mechanization of the sugar and other industries. A government-sponsored commission could investigate and make recommendations. Useful recommendations should be urgently implemented.

A Manpower Centre is needed to provide a co-ordinated employment and training programme for employees. Upgrading academic programmes and training schemes for the unskilled and semi-skilled could provide qualified and skilled personnel in areas of greatest demand. An adult literacy programme and training in basic agricultural techniques might improve the attitude to manual work. If provisions are made to train displaced employees and place and absorb

redundant workers, a potentially explosive situation because of unbearable suffering can be prevented. Factories and government should provide the required facilities and personnel at evening and Saturday morning classes.

There is currently (February, 1968) an unpublished report on the sugar industry. The Mordecai Commission of Enquiry was sponsored by the Jamaica Government in 1966 to study and report on the problems and prospects of the sugar industry.⁷ Employees and management of the industry are anxiously anticipating its publication. It is hoped that there will be valuable suggestions for the improvement of the industry and that the government will implement them.

2. THE ECONOMICS OF RICE PRODUCTION

It has been shown that increased rice production could improve Jamaica's adverse balance of payments and provide new jobs for thousands who are currently (1968) unemployed.

In 1959, it was suggested that if 1,500 new acres were cultivated in Westmoreland a net income of \$47,700

7 <u>Ibid.</u>, p. 49.

($\pm 18,000$) could be derived. The cost of production was \$100.70 (± 38) an acre. At the then government price of \$5.57 ($\pm 2.2/-$) per 100 pounds of paddy, an estimated net income of \$31.80 (± 12) could be obtained from each cultivated acre.⁸ The 1968 price paid by the government for paddy is \$5.94 ($\pm 2.5/-$) per 100 pounds.⁹ An estimated fifteen to twenty 150 pound sacks are obtained from one acre of paddy at New Hope. The cost of production is reduced to \$92.40 (± 35) per acre because of the use of crawler tractors for tillage in that district.¹⁰

The yield of 2,250 pounds (15 bags) an acre is used to provide a moderate estimate of the current (1968) potential rice industry in Westmoreland. If 1500 additional acres are used for rice production the net income would be \$61,875 (£23,437.10/-). This is a net income of \$41.25 (£15.12/6) an acre. The number employed in rice

8 "Memorandum on Rice Industry, Westmoreland."

⁹ Interview: D. P. Wilson, Manager, Agricultural Development Corporation Rice Plant.

¹⁰ John Salabie, landed proprietor and farmer, New Hope. John and the writer were contemporaries at the Townhead Elementary School. He has been cultivating rice from childhood at Townhead and New Hope. His brothers and he cultivate rice and sublet land to other farmers for this purpose at New Hope. It was from his submission of detailed costs of the 1.5 acres he cultivates that the cost of production was established.

production in the parish would be about 5,000 because of mechanized tillage.¹¹ However, the increased per capita income would stimulate extensive rice production.

This suggestion is particularly significant at this time when the price of sugar is low and mechanization at Frome is releasing redundant workers on the labour market. Large farmers could be asked to rent pasture lands which are swamps for rice cultivation from May to November, since only limited grazing is possible during these months. The Government could assist the owners of Landillo, George's Plain properties and a large swamp at Sheffield to establish canals, on condition that they are leased for fixed periods to farmers. Some sugar cane lands could be re-converted into rice cultivation for the same reason as suggested in 1959.¹² The price of world sugar is decreasing. Negril Spot (different from the Great Morass) and the Old Hope Broughton areas should be drained.¹³ These improvements could be effected through the Land Utilization Commission in co-operation with the Ministry of Agriculture

12 "Memorandum on Rice Industry, Westmoreland."

¹¹ All the rice fields observed were of small acreage; consequently, no economies of scale can be obtained. The average exchange value of L in 1959 was \$2.65 (Canadian).

¹³ Journal of the Jamaica Agricultural Society, <u>The</u> <u>Farmer</u>, November-December 1966, Vol. LXXI, Nos. 11-12, p. 243.

and Lands Extension Services in Savanna-la-Mar.

There are a few prerequisites to the successful accomplishment of this project. The government must first set an example to the large property owners of the parish by completing its land reclamation scheme at the Great Morass. A government proposal was put forward for its completion as part of the five-year independence plan but it has not been implemented.¹⁴

A suitable system of land tenure needs to be legally established. The present system of land tenure provides little incentive for the farmer to introduce improvements of any significance. Neither does he feel inclined to plant permanent or semi-permanent crops. "Most leases are on an annual basis, with no provision for renewal, and therefore /give7 little security."15 Annual rates of rental for certain categories of land should also be fixed. This could prevent large property owners from overcharging their tenants. The Farm Machinery Pools could provide tillage on a regional basis. Priority should be given to peasants who cultivate land in government-sponsored project areas. All the rice fields in one region, for example,

> 14 <u>Five-year Independence Plan 1963-1968</u>, p. 106. 15 <u>Ibid.</u>, p. 18.

could be tilled simultaneously to reduce the transportation costs and permit the more efficient use of machinery by eliminating tillage of fragmented plots.

Cost factors are important limitations to the implementation of this project. The current price of \$5.94 (12.5/-) per 100 pounds of paddy is one of the highest paid for this commodity. Guyana, for example, pays \$2.64 (11) or 44.4 per cent less.¹⁶

The importation of rice instead of its production on a larger scale in Jamaica raises an economic and ethical question. It is probable that Guyana produces rice at a considerably lower cost of production than does Jamaica. Probably the yield is also greater. These factors could cause it to be more economical for Jamaica to import rice than to produce it herself, but the ethical aspect should not be ignored. Can a country with unemployment and balance of payment problems afford to underutilize its land and increase its imports? The island is over-dependent on sugar and bananas, the major staple products. Increased rice production would diversify the economy, reduce the unemployment, divert money from imports into the pockets of its citizens and relieve suffering. Full utilization

¹⁶ Wilson, <u>op</u>. <u>cit</u>. Part of the difference in the price could be attributable to a different type of **rice** but this was not stated by the source.

of the available rice resources seems to be the better solution.

3. LABOUR AND ECONOMIC DEVELOPMENT

Labour is considered in three ways: as a factor of production, as a receiver and disburser of income, and as a member of society in which development is taking place.¹⁷ Accounts of the nature of the labour shortage, the pattern and the conditions of rural labour supply are included in these discussions.

Incidental references were previously made to labour as a factor of production. The references showed that the labour supply is greater than the current demand for workers and that the quality in the agricultural sector needs to be up-graded. Labour must be available to cooperate with other factors of production to promote economic development. The labour supply may be quantitatively adequate but qualitatively insufficient.

The quality of labour depends on the energy available to the worker. It is influenced by his health, diet and physical characteristics. These factors affect the

¹⁷ G. E. Cumper, "Labour and Development in the West Indies, Part II," <u>Social and Economic Studies</u>, Vol. II, No. 1, March 1962, p. 1.
worker's physical efficiency. They differ widely among groups of workers in Jamaica. These variations exist because

...diet is clearly unsatisfactory in many areas, lacking, especially, protein and certain vitamins. Chronic diseases such as malaria and hook-worm are sufficiently prevalent to be of economic importance.¹⁸

A clear connection between physical factors and productivity has not yet been established. However, the possible influence of such factors on the quality of labour should not be ignored.

Another aspect of the quality of labour is the power of workers to organize themselves in relation to their tools and other materials. This ability is dependent on the specific, general and informal education of workers. In Westmoreland, it has been shown that the elementary school is the source of general education for the majority of agricultural workers. Office and managerial staffs are drawn from secondary and university graduates and nongraduates from Westmoreland, other parishes and, in a few cases, overseas. The apprenticeship system at Frome is apparently satisfying the factory demand for skilled labour. One reason for complaint exists from the employer's point of view. Apprentices often leave Frome to work

with the bauxite companies on completion of or during the later stages of their apprenticeship. The mobility is advantageous to the employees who earn more as a result since the bauxite companies pay higher wages than the sugar industry. Such mobility is viewed with apprehension by the management of the sugar industry which loses skilled and semi-skilled employees after the expenditure of time and capital to improve their skills.

Many of the functions of a modern factory can be impeded if workers cannot use written channels of communication, for example, instruction books, notices and work records. The factory employees of Westmoreland and other parts of Jamaica are sufficiently literate to function satisfactorily.¹⁹ This satisfactory level of literacy is also evident on large farms. It exists on peasant farms to a very limited degree.

A good formal education helps the worker's power of organization by increasing his general knowledge and occupational mobility. By increasing his general knowledge, it directly influences his power to adapt to marginal situations not covered by specific training.²⁰ These

19 <u>Ibid</u>., p. 23. 20 Ibid., p. 24.

powers tend to be less developed where there is a low level of school attendance as in Westmoreland.

The effect of informal education on the factory and agricultural worker may not be measurable but is appreciable. In well developed societies, the population is exposed to the following:

1. Products of factories.

2. General knowledge of their surroundings.

3. Early introduction to skills.

The above is obtained through the consumption habits of the people in well developed countries as well as through the mass communication media of radio, newspapers and television which are less available to residents of underdeveloped countries. Many Canadians, for example, can drive a car from their early teens. Others can operate the tractor from an early age. These skills are seldom acquired from such early years in Jamaica although such skills can be easily diverted into productive channels. The more general awareness of consumer goods in the former is advantageous to the workers. Consequently, the adaptability of labour is greater in developed than in under-developed countries partly because of the more sophisticated and widely distributed informal means of education.

A. Labour Shortage

An investigation of labour shortage questions the availability of supply in relation to the demand for labour. It leads to an investigation of size and the age and sex characteristics of the population since the available labour force is a function of these categories. Other cultural factors such as religion, training and diet may also be significant. One investigator showed that among Jamaican males, those of the age group 25 to 54 years work longer hours than young men of 15 to 24, and longer than the older men.²¹ Populations with high fertility ratios tend to be short-supplied with female labour because females withdraw from the labour force to care for their children.

The complaint of labour shortage in Westmoreland seems to be more problems of labour recruitment and administration in certain employment areas than real labour shortage. A lack of communication between the unemployed and the potential employer is evident in all areas. There is no employment agency in Westmoreland. The employer who

21 M. G. Smith, <u>A Report on Labour Supply in Rural</u> Jamaica (Kingston, Jamaica: The Government Printery, 1959), p. 4.

needs help informs his employees or friends who convey messages to people they know in order to find out if they can make themselves available. This procedure sometimes leads to loss of time, especially on small farms. Promises may be made but never fulfilled when more lucrative opportunities are accepted. Others may take piecework and prolong the period for its completion. Such frustrations are less frequent on some large farms which have small offices and recruit labour at fixed periods weekly. However, they also lack efficient means of communication which would enable potential employees to know the type of work available and the number of employees required in a given week.

Some employers (farmers and non-farmers) complain of labour shortage because they have been indoctrinated in the myth of "the laziness of the peasantry." Others express the same opinion politely by referring to the "leisure preference" of the peasants without any awareness of the nature of the problem. A "preference for leisure" is a normal human condition in which the peasants sometimes show over reliance for reasons previously discussed. The historical and some socio-economic reasons for the indifference of unskilled and semi-skilled workers were already given as the reverence for white collar jobs

acquired from slavery, past and present low incomes for these services, the frustrations resulting from the cultivation of steep slopes and soils of limited fertility, and the predominant use of hand tools instead of machinery.

Another factor that needs to be discussed is the availability for wage employment of farmers who cultivate land for themselves. These part-time, self-employed farmers are not completely free to allocate their time to seek wage employment on other farms. Consequently they are sometimes unavailable for regular work offered by estates and large farms. Others who are not tied to the farm by family or other pressures, particularly the young unmarried males, seek other forms of employment or spend their surplus time in non-commercial ways. The last group, who spend their time river-fishing for sport, cricketing, collecting fruit from pastures and digging wild yams (Eboscorea) for survival, are few.

Labour shortage on farms could be reduced by better communication, more efficient recruiting methods and by providing greater incentives for this type of service. The existence of a labour shortage may be exaggerated by some farmers but cannot be ignored. It is a recognizable problem when cane is to be harvested. Some loaders and cutters are unwilling to perform these tasks. Tardiness

in these areas could cause economic loss to farmers.

The grouping of small farmers, who complain of labour shortage, into little units under already established government development schemes could be a method of relieving this shortage. Each group could be organized to provide regular employment for a specific number of agricultural workers on plots that should become privately owned model farms. Government labour officers and Agricultural Extension and Welfare officers should be assigned the organization, supervision and allocation of the labour force within each group. Partnership work should be encouraged among group members. The emphasis should be on the teaching of the peasants and farm hands scientific agricultural methods on existing land settlement areas and on schemes which are to be established. The officer in charge of such groups should be responsible for measurement of tasks, ensuring of prompt payment and for judging the standard of work. Attempts should be made to avoid friction between employer and employees.²² The above

²² <u>Ibid.</u>, p. 24. The method will result in the addition of a few more civil servants to the payroll. However, it should not be forgotten that thousands of acres are currently being utilized inefficiently by peasants on government settlements which are inadequately supervised. The successful organization of these workers could be a major stimulus to agriculture and a method of making agricultural employment more acceptable to the peasants.

suggestion would probably work well in the land settlement areas of Westmoreland where management is a major limitation on peasant farms. Farmers in neighbouring districts to the settlements could be easily persuaded to join or imitate their neighbours if the organized units were proving successful.

B. <u>Rural Labour Patterns</u>

Rural labour in Westmoreland is classified under the following: estate labour, employment on large and mediumsized properties, and labour on small farms.

(a) Estate Labour

On the Estate, labour is organized by trained agricultural and administrative staffs under conditions acceptable to the trade unions. The objective is the reduction of supervision to the minimum and the provision for rapid transfer of the labour force from completed tasks to new jobs in order to achieve efficiency and satisfy the demands of the Estate. Workers are employed at task-work, or as daily, weekly or monthly employees. Some administrative staff is employed on a monthly basis. Task-workers are

primarily employed at agricultural tasks or periodically in the factory when special jobs need immediate completion. Agricultural task-workers are supervised by estate headmen who give out the piecework. Job or piecework in the field is given to casual employees. They generally assemble at convenient and regularly used locations at the beginning of each work week for their tasks.

Headmen are responsible to overseers who are liason officers between the Central Office at Frome and field workers. These headmen inspect the completed tasks and recommend payment. Clerks are sent out on Thursdays to the various stations to pay the agricultural workers. Others receive their wages at the different offices at Frome Central.

(b) Employment on Large and Medium Properties

Administration, as previously shown, is frequently by the individual farmer or immediate members of his family. Some farmers with larger properties have headmen who supervise the appointment of employees and assignment of tasks. They are responsible to the owner. A number of these large farmers exercise considerable paternalistic control over their employees.

(c) Labour Patterns on Small Farms

The primary personal control of the small farmer over his farm has already been stated. The patterns of labour on his farm are associated with wage-labour, "diggingbees," partnership arrangements, and "day-for-day" work.

A few small farmers pay others to assist them for a day or two at sowing time to prepare the land and plant the crops.

Bad social relations, a reputation for vindictiveness, meanness or the like can go a long way towards depriving a person of local labour supply. A good reputation, even if undeserved, may do the opposite.23

Consequently, complaints of labour shortage among some of these farmers may well be the result of their unfavourable reputation in the districts in which they live.

"Digging-bee," "Morning-Sport," or "digging" is free work by a large group on another's farm. The host supplies the food and rum and the visiting farmers work, to the rhythm of digging songs, for a day. This method of getting work done may be as expensive as the employment of farm hands. However, it has the advantage of enhancing the

23 <u>Tbid.</u>, p. 10. It is interesting to note that many of the large farmers of long standing in the communities visited found it easy to obtain the employees they required.

reputation of a generous host, thereby ensuring an easy supply of labour in the future.

"Partnership is free and voluntary co-work." One farmer works for the other. They take turns on each other's farm. Both start working together and end at the same time on the day when each becomes the host. These partners are not fully on the labour market until they have discharged their obligations to their partners. As a result of a partnership, other jobs are sometimes refused, to satisfy the urgent needs of a partner.

Lend-day or "day-for-day" is the exchange of work between two men, limited to a day. In this arrangement one farmer may have more than one "partner" or other men, with whom he makes these exchanges. The "day-for-day" is a looser type of arrangement than the partnership. Reciprocity may be limited to periods such as harvesting and planting.²⁴

The usage of digging-bees, lend-days and partnerships are less widespread than formerly. Farmers are seemingly more anxious to obtain today's higher cash income. Task-work is still evident on the farms. Many farmhands prefer the day's wage basis to task-work. Employment at fixed daily rates is preferred by workers on all farms.



The most widely used pattern on the farm is task-work.

Task-work had its historical foundations in the former British West Indies after emancipation. The relative labour shortage which followed caused the estates to develop systems of task work. Some forms of "jobbing" or contract-work existed before emancipation but there was no reason to place much reliance on the task pattern prior to this.²⁵

Frome still takes the lead in assigning fixed jobs to agricultural workers at rates agreed on between the Estate and the unions. Other farmers copy this pattern.

With the exception of task-work, these labour patterns evolved as attempted solutions to problems on peasant farms. Small farmers who were lacking in capital used "work-bees," "lend-days" or partnerships to attract the required labour supply. These methods are resorted to less frequently as wages have risen and the younger generation seeks the increased cash income. Social and economic life is changing and this is influencing modifications of the labour pattern on all farms. Estate operations are becoming increasingly complex and specialized.

25 Ibid., p. 18

4. MARKETING CRITICISMS

An introduction has been given to the weaknesses of local government marketing. They are: inadequate supply of marketing facilities, an excessive number of markets in certain areas, and adverse political influence on the system.

None of these structures have provision for storage of agricultural products. There is no refrigeration for meats or vegetables which are easily spoiled. The stalls are insufficient and although representations have been made to the local government it acts slowly. Consequently, many products are placed on the concrete where the sanitation is less than conducive to health. Fortunately, the majority of these goods have to be cooked before they are eaten. Cooking results in a reduction in the danger of bacterial infection to the consumer.

The lack of storage and refrigeration facilities constitute serious limitations to farmers, especially during surplus periods. Products are sometimes spoiled when all the supply is not sold. The average farmer or butcher has no storage facilities for fruits, vegetables, beef or fish, which spoil easily. Therefore, provision should be made to store surpluses co-operatively at minimum costs to these

users.

An excessive number of local government marketing centres in certain areas results from historical factors connected with their construction. Initially, some were constructed to satisfy consumers in the "horse and buggy" days when pedestrians were the chief users. They were. therefore, located in close proximity to the users. Three centres, for example, Petersfield, Shrewsbury and Hartford are within a two-mile radius.²⁶ They were also linked to the small sugar estates which were subsequently centralized under the West Indies Sugar Company's control. As a result of these changes and improved transportation, the smaller centres tend to decline in importance and are being subsidized. It would be more economical to consolidate the system by enlarging that at Petersfield, the more densely populated of the three centres, and by abandoning the other two. Petersfield would also be the best choice because it is one of the centres with electricity. Shrewsbury, Hartford, Locust Tree, Masemuir and Retreat are without this amenity.27 The inadequate supply of electric power is not only a limitation of the marketing

26 Marketing Supervisor, op. cit.

27 Ibid.

system but also of many other types of economic activity.

Efficient methods of consolidating the system must have been considered by the local government leaders. However, some of them are unwilling to act because it is in their political interest to maintain these centres. Some members of the local communities would be unwilling to accept the changes and opponents could seize this opportunity to win a few votes by adding their voices to the opposition.

This adverse political rivalry is exhibited in another aspect of marketing. It is quite evident that a reduction of fees by 25 per cent in 1963 has not contributed economically to the management of the markets. (See Appendix IX). Labour costs are rising. Most of these markets have to be subsidized. A political policy designed only to obtain the vote of the small farmer is a misdirected effort. Consolidation and the more realistic rates are more likely to result in far-reaching benefits to the community as a whole. The markets can be made to pay for themselves and the subsidies used for developments on the farms of the small farmers, and to install storage facilities.

5. A PROBLEM OF THE BANANA INDUSTRY

A major problem of the Banana Board is the maintenance of an adequate level of supply of bananas for shipment in order that the industry can remain viable.28 Since 1966, a new six-year contract between the Board and the shipping companies requires that the Board pays for the shipping space ordered whether it is fully or underutilized.²⁹ This has necessitated special appeals to farmers to maintain certain production levels. Producers are not responding sufficiently to the appeals. They sell their products to local buyers where they are obtaining a higher price. This is only a temporary advantage to some producers, for instability in the pattern of deliveries has unfavourable effects on the freight rates of the Board, the shipment of the fruit, and the industry as a whole. There were low shipments, for example, in a number of weeks preceding Christmas of 1967. In Christmas week over a thousand tons more than the previous week were delivered to the Board. Consequently, over 300 tons of fruit had to be refused. These surplus bananas could easily have been shipped during the preceding weeks or in the week after

^{28 &}quot;Statement by Mr. K. F. Jones, Chairman, Banana Board, 4/1/68," p. 2. (typed manuscript).

²⁹ Central Planning Unit, <u>Economic Survey Jamaica</u> <u>1966</u>, p. 53.



during Christmas week. It fell drastically to 1,000 tons the following week.³⁰

A quota system to large and medium producers could In January 1967, the reduce if not eliminate this problem. Board requested growers to provide weekly estimates of the quantities of fruit available for export as a possible solution.³¹

6. CAPITAL AND CREDIT AVAILABILITY

Most of the recent annual reports on agricultural productivity in Westmoreland acknowledge the limited availability of capital and credit as a major obstacle to development on medium and small farms. Lack of the required security is a primary reason for many farmers' failure to obtain loans.³² Incomes are generally low and consequently only a limited amount of savings are available for investment.

30 Statement 4/1/68, p. 1.

31 The Central Planning Unit, Economic....1966, p. 53. The question may be asked if the fruits were fit for harvesting in the previous weeks. If they were not a solution of the problems would be more difficult. Varieties would have to be developed in order to fulfil the market requirement or crop zoning to permit harvesting in different areas at different times.

32 The Ministry of Agriculture ..., Annual Report 1966/67. p. 6.

The institutions discussed in this section are dealt with as sources of credit. Commercial banks and People's Co-operative Banks are the main sources of credit to farmers. Loans are also obtained from credit unions, the Westmoreland Building Society, the Cattle Insurance Co-operative, and private individuals such as lawyers, doctors and businessmen.

A. <u>Investment Capital</u>

An eminent economist, Professor Arthur Lewis, suggested that savings from labour for investment in underdeveloped countries tend to be zero or negligible. No close functional relationship between domestic savings and investment oexists in the West Indies. Savings of the working class in Jamaica and the other areas studied tend to be over short periods and are directed toward future consumption.33

The levels of income in Westmoreland in 1960 suggest possible reasons for the limited availability of local

33 G. E. Cumper, "Labour and Economic Development in the West Indies, Part II, "Social and Economic Studies, Vol. II, No. 1, pp. 18 and 19.

investment capital for agricultural development.³⁴ (See Table 16.). Of the classified labour force (males and females), 40.1 per cent earned under \$133 and 66.6 per cent had an income of less than \$266 annually. The cash income of the majority of wage earners is low and therefore only a very limited margin is left for saving after con-Because of the scarcity of investment capital sumption. from personal savings, farmers depend on government loans and subsidies to a great extent. The government relies on short-term borrowing to meet its trading deficit with the rest of the world. Since borrowing cannot continue indefinitely, some greater degree of equilibrium must be established in the future between local savings and investment.35

Incomes are rising. In 1965, wages were increased in certain categories of employment at the Frome Factory. It is hoped other increases will be sufficient to compensate for the rising cost of living or no gains will be made towards the increasing of savings for investment.

35 Ibid., p. 18

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³⁴ O. C. Francis, <u>The People of Modern Jamaica</u> (Kingston: Department of Statistics, 1960), extracted from Tables 9.1 and 9.2 The exchange value of the L in 1960 was \$2.66.

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TABLE 16

WAGE EARNERS IN THE CLASSIFIABLE LABOUR FORCE CLASSIFIED BY PARISH OF RESIDENCE AND INCOME GROUPS - 1960

Parish Sex Percent	Total	Under £50 or under \$133	£50 = £99 or \$133 = \$263.34	£100 - £199 or \$266 -	£200- £499 or \$532 - \$1,327.34	£500- £999 or \$1,330- \$2,657.34	£1,000- £1,999 or \$2,660- \$5,317.34	£2,000 and over or \$5,320 and over	Not Stated
Male Westmoreland	14,683	4 ° 575	4,,518	3,286	1,530	332	93	19	330
Percent	100	31.2	30.8	22.4	10.4	2.3	.6	ч.	2.2
Female Westmoreland	7,719	4,554	1,,719	584	393	131	3	-1	334
Percent	100	59 ° 0	22.3	7.6	5.1	1.7	8	8	4.3
Median Income	Mal £80 0	e r \$212.	80		Female £42.4 or \$	112.25			

B. People's Co-operative Banks

Of the ninety farmers who answered the questions on farm financing, 43.3 per cent utilized the available credit facilities, 25.6 per cent borrowed from People's Co-operative Banks and 17.7 per cent made loans from commercial banks.

The People's Co-operative Banks were designed to supply chiefly short term credit but they make short, medium and long term loans. Short term loans are contracted from one to under three years, medium from three to approximately five, and long term loans are payable within five to a maximum of ten years. The majority are made for the shortest period.

Loans are issued for agricultural purposes, family needs, for the construction, repair and maintenance of farm buildings, improvement of water supply, and construction and repair of dwelling houses.³⁶

The Banks' operations are subject to the clauses of the Agricultural Credit Board Law (1960) and the Farm Loans Act of 1965. The former empowers the Agricultural Credit Board to regulate them and other agricultural loan

³⁶ The Jamaica Gazette Supplementary Proclamation Rules and Regulations, Vol. LXXXVIII, No. 135, November 8, 1965, p. 3.

societies. This Board can inquire into their administration and accounts and take over their management under the provisions of the law. They are subject to government supervision.

A part of the capital of the People's Co-operative Banks is obtained from pooling the resources of shareholders. Each shareholder is required to purchase a minimum of a \$2.64 (El) share. The greater proportion is obtained as loans and free grants from the Agricultural Credit Board.

Loans may be made to each agricultural loan society or approved organization by the Board to a maximum of \$26,400 (Ll0,000). Free grants may not exceed \$1,320 (L500) in any one year without prior approval of the Ministry of Agriculture and Lands.³⁷

Credit is made available by People's Co-operative Banks subject to the clauses of the Farm Loans Act (1965). One or more of the following is necessary to guarantee the loan:

1. Land legally owned by the borrower;

2. movable property of the borrower;

37 <u>Ibid.</u>, p. 4. An agricultural loan society is any registered body of persons established to encourage and promote the agricultural interests of its members and to make loans to its members for agricultural purposes.

3. any crops to be established or maintained by way of expenditure defrayed out of the proceeds of loans.³⁸

Other factors are also considered by managers who issue credit. They try to establish the borrowers' honesty and ability, his repayment capacity, the purpose for which each loan is made, and the financial position and progress of the borrower.³⁹

Most loans are made by People's Co-operative Banks to farmers. Small and medium sized property owners are the chief users. None of the large farmers interviewed made use of these facilities.

Two interest rates are operative since 1960. An interest rate of $7\frac{1}{2}$ % is charged on acceptance loans. These are loans made on demand with guarantors. They involve greater risks, consequently, they are made at a higher interest rate. Loans based on mortgage or other forms of collateral security are made at 6% interest.

The main reason for refusal to grant loans is unsuitable security. At other times the demand is greater than the available money supply. Refusals for the latter

38 Ibid., p. 3.

³⁹ Interview: Miss C. Atkinson, Acting Manager, Burnt Savannah People's Co-operative Bank, July, 1967. Over 90% of the loans issued by this bank was made to farmers.

reason occurred in 1959.⁴⁰ This occurrence is possible because aggregate loans by the Credit Board to the Banks are made annually on the basis of the share capital of each bank. The yearly loans available to the Petersfield People's Co-operative Bank are about six times the value of its share-capital.⁴¹ Loan from the Credit Board is the chief source of the Bank's capital.

Loans granted by these banks were reduced substantially in 1967. (See Table 17)⁴² Lack of security and the possibility that farmers with suitable securities acquired adequate loans for their farm development in previous years are probable reasons for the reduction.⁴³

Some criticisms of People's Co-operative Banks concern the small amount of credit supplied to each borrower and the short period allowed for repayment. It is argued that short periods for repayment do not promote long-term development such as the cultivation of permanent crops. One may state as a rebuttal that the majority of users are sugar cane cultivators on the plains. This semi-permanent

40 Interview: A. Lawrence, Secretary, Grange Hill People's Co-operative Bank, June 27, 1967.

41 Interview: W. E. Dunn, Secretary, Petersfield People's Co-operative Bank Limited, July, 1967.

42 The Ministry of Agriculture...<u>Annual Reports</u> 1965-66 and 1966-67, p. 5.

⁴³ Ibid., 1966-67, p. 6.

TABLE 17

LOANS APPROVED IN WESTWORELAND BY PEOPLE'S CO-OFERATIVE BANKS AND THE AGRICULTURAL CREDIT BOARD

		LOANS	1/4/65 - 31/	3/66	
Name of People's Comopera- tive Bank	No. of appli- cations recom- mended by Credit Board	Amount £.s.d.	No. of applica- tions approved by P.C. Bank and Credit Board	Total amount of loans approved £.s.d.	Dis- burse- ment of loans £.s.d.
St. Peter's Upper W/Land Little London Grange Hill Sav~la-Mar Petersfield Burnt Sav'h. Darliston New Works S.E.W/Land	1 2 2 2 2 2 3 3 8 8 8 8 8 8 8 8 8 8 8 8 8	4,030 6,262 6,262 4,630 4,630 800	152 197 142 285 231 252 255 255 255 255 255 255 255 255 25	9,618.11.2 14,670 2,300 8,645 6,943 6,943 6,943 4,800.10 3,897 2,485 14,977	9,013112 11,420 2,300 12,1961211 6,478 1,44696 4,80010 3,247 2,045 4,443
Total	165	34,873	808	73,70056	57,39037

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Cont'd.

TABLE 17 - Cont'd.

LOANS APPROVED IN WESTMORELAND BY PEOPLE'S CO-OPERATIVE BANKS AND THE AGRICULTURAL CREDIT BOARD

	j.	LOANS	1/4/66 = 31/3	/67	
Name of People's Co-opera- tive Bank	No. of appli- cations recom- mended by Credit Board	Amount £.s.d.	No. of applica- tions approved by P.C. Bank and Credit Board	Total amount of loans approved £.s.d.	Dis- burse- ment of loans £.s.d.
St. Peter's	OL	UYCL			
) - 1		TYT	402 "TT	6,885
upper w/ Land	4	380	19	1,586	1,581
Ltle London	2	855	28	2,215	100 C
Grange Hill	4	965	41	4.302	~ 3 ~ 4 / V
Sav-la-Mar	30	9450	35	4.544	4 8 0 6 0 1. 26 L
Petersfield	18	2840	15	3 020	4 » « Ot
Burnt Sav'h.	JO	1385	8		U AC e A
Darliston	Ч	50	56	3 415	2 1.65
New Works	2	074L	37	0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
S.E.W/Land	1	100	51	8,057	4,9/3 8,100
Total	92	18,785	433	42,254	35,829

crop demands most of the capital expenditure in the first year to prepare and cultivate the land. Yields from this product can provide capital to repay the loans within three years. In practice, small borrowers are given shorter periods to repay loans at commercial banks than at People's Co-operative Banks.⁴⁴ It is realistic that the period for repayment of small loans should be shorter than for larger amounts but larger amounts could be made available for disposal by these banks to farmers for farm development.

Most of their users are on the plains since the majority of People's Co-operative Banks are located in these areas, and because sugar cane is the chief cash crop. The attraction of the sugar factory and major population centres such as Savanna-la-Mar, Grange Hill, Petersfield and Little London are other possible reasons for most users to be centred on the plains.

C. Commercial Banks

A provision was made to improve credit facilities to farmers under the Farm Loans Act. The Government provided a guarantee to a maximum of \$7,920 (b3,000) in respect of loans made by commercial banks for expenditure on specific farming projects.⁴⁵

44 Dunn, op. cit.

45 The Central Planning Unit, <u>Economic Survey</u> Jamaica 1965, p. 45.

The Bank of Nova Scotia and Barclay's Bank, Limited, have a branch each in Savanna-la-Mar. Barclay's Bank has two agencies, one at Grange Hill and the other at Frome.⁴⁶ Both banks make loans in accordance with the Farm Loans Act and on their own initiative. There is no limit to the amount of loans which these private institutions can make. Each borrower is considered on his own merits. Large farmers are the chief borrowers.

Generally speaking, the farmers' repayment of loans is good. Crop failures are the chief reasons for inability to make prompt repayment. The majority repay loans via the West Indies Sugar Company on the basis of their cane deliveries.⁴⁷ The Barclay's Bank agency at Frome emphasizes this function and operates only during harvest.

Short term loans are emphasized by these commercial banks. They require better security and take fewer risks. Consequently, credit is less easily obtained from commercial than from People's Co-operative Banks.

Westmoreland Building Society

Farmers are not the chief users of credit provided by the Westmoreland Building Society. Only a few cultivators use this medium to save towards the acquisition of a homestead. It requires reliable income in order to save at regular intervals.

46 Interview: W. A. Slack, Manager, Barclay's Bank Ltd., Savanna-la-Mar, July 14, 1967.

47 Interview: Mr. Sangunette, Manager, The Bank of Nova Scotia, Savanna-la-Mar, July 19, 1967.

These characteristics are not commonly found among most farmers of the parish.

D. <u>Credit Unions</u>

Credit unions are generally organized to provide services to members who belong to the same professional or employment group. A teachers' credit union, the Police Credit Union, and Frome Co-operative Credit Union (1962) Limited are in Westmoreland. Two are obviously organized among professional groups outside the scope of this study. The third has little connection because it was organized to provide loans to employees of the West Indies Sugar Company, Frome Limited and their immediate families.⁴⁸ There were 988 members at the end of 1966.⁴⁹ Some of them are parttime farmers. Hence, a small proportion of the loans they contract are probably used for agricultural purposes.⁵⁰

48 Frome Co-operative Credit Union (1962) Ltd., Sixth Annual Report 1966 (Kingston, Jamaica: Metro Press Ltd.), p. 19.

49 <u>Ibid</u>., p. 6.

50 John Peter Sullivan, <u>Credit Union West Indian</u> (Kingston, Jamaica: Social Action Centre, 1960), p. 23. The balance outstanding on loans to members was \$395,191.29 (\pm 132,171). The rate of interest is fixed periodically by the Board of Directors. It should not exceed one per cent per month on unpaid balances except when the total interest chargeable is less than 13e (1/-). When this occurs, the interest rate should not exceed 13e. The average exchange value of the \pm in 1966 was approximately \$2.99 (Canadian).

E. Private Individuals

The role of private individuals such as lawyers, doctors, and businessmen is apparently of minor importance in the supplying of loans to the farmers of Westmoreland. Few farmers seek loans from private individuals because of the greater fear of loss of property, high interest rates and excessive monthly payments. Farmers fear that contracts between them and other individuals are less clearly defined than agreements with the Government and other credit institutions. Some farmers are suspicious of lawyers who, they fear, may draft contracts in legal terminology unintelligible to them. Such contracts, farmers believe, could cause them to lose their land.

Two farmers were interviewed who utilized credit from private individuals. One, a widow, used loans from a lawyer to purchase land. At the interview, she complained of high interest rates and high monthly payments. Arrangements had already been made with a commercial bank to repay the lawyer. The interest rate and monthly payments she was required to make to the bank were less than the former payments. The problem is partly the result of the inability of some borrowers to arrange terms of contract to their satisfaction and the onerous contracts of some lenders.

This condition varies from one individual to another. A few usurers give the majority a poor reputation, sometimes. However, some private lenders in Westmoreland are paternalistic, kind and helpful to their debtors. The terms of their loans are less burdensome.

F. Solutions to the Credit Problem

Possible solutions to scarcity of credit are the provision of a greater supply of loans at lower rates of interest, the reduction of the required security and the lengthening of the repayment period. Solutions to this problem vary with the state of the economy and the economic policy of the government.

Some farmers of Westmoreland need financial assistance and guidance to enable them to obtain legal title to their land in order that they may be able to secure credit from existing institutions. A lawyer appointed by the government in conjunction with an officer of the Ministry of Agriculture and Lands Extension Service in Savanna-la-Mar could assist farmers requiring this service at fixed minimum rates. A list of farmers who fail to obtain loans because of improper security could be compiled by contacting the managers of the major credit institutions. These

managers could also be requested to disseminate information on the available service for the legalization of titles. Circulars and publications in <u>The Daily Gleaner</u> (the popular local newspaper) could be used as a major means of publicity. Much could be achieved by providing the service for the legalization of titles for one year.

G. Uses of Loans

The thirty-nine farmers interviewed who obtained loans utilized them for planting (34.4%), purchasing seed (16.7%), buying livestock (14.4%), harvesting (12.2%) and repairing and constructing dwellings (12%). Loans are also used for other purposes such as the purchasing of machinery and fertilizers, improvement of water supply, and construction of farm buildings, for example, dairy sheds and piggeries.

7. PRAEDIAL LARCENY

Praedial larceny is theft of farm products. Some areas of Jamaica are declared to be under the Praedial Larceny (Prevention) Law (1952). In these areas, community committees are empowered to employ armed patrols and to

pay for information leading to the detection and conviction of praedial thieves, accomplices and receivers.51

This law could be enforced effectively in certain districts of Westmoreland where theft of small livestock and other farm products are creating anxiety among farmers. The incidence of praedial larceny has been considerably reduced where committees are active.⁵² No "declared area" is known to be in Westmoreland but the insecurity created by loss of products because of theft could be reduced by enforcement of the law.

8. SOIL AND WATER CONSERVATION

Soil and water conservation practices include attempts to stabilize soils and reduce soil erosion, maintain and improve the productivity of the soil, and to increase efficiency in the use of water. These practices are classified into two major groups: agronomic and engineering practices.⁵³

51 Edwards, op. cit., p. 34.

52 Journal of the Jamaica Agricultural Society, The Farmer, Half-yearly Report, Vol. LXVI, No. 1, January 11, 1961, p. 26.

53 G. W. Morgan, <u>Soil and Water Conservation</u> (Kingston, Jamaica: The Government Printer, 1963), p. v.

Costs and the technical skill required for the implementation of engineering methods eliminate their usage by the majority of local farmers. This paper will, therefore, discuss the important agronomic practices which may be used by residents of Westmoreland.

It must first be stated that although evidence suggests the presence of soil erosion on steep slopes (see Appendix VI, No. 1) and insufficient water supply during drought, the efforts to conserve soil and water are insufficient. In a few stony and mountainous districts, contour stone barriers are used where the stones had to be removed to permit cultivation. These were the few observable examples of soil conservation. None of the farmers interviewed practised crop rotation. A few large farmers and the government are maintaining the forested summits of mountains for water conservation. The West Indies Sugar Company has established over 200 acres of forests in the watershed areas and also granted some 600 acres to the government for this purpose.54

It has been suggested elsewhere that the farmer should make his conservation farm plan in consultation with the Ministry of Agriculture and Lands Extension Officer.⁵⁵

54 The West Indies Sugar Company, <u>W.I.S.Co.</u> in Jamaica, p. 12.

55 Morgan, op. cit., p. 1.

Crop rotation, mulching, field strip cropping and vegetative barriers are suggested as simple agronomic practices by which farmers could conserve soil and water.

A. Crop Rotation

Crop rotation is the growing of different crops in recurring succession on the same land after short periods or in a number of years. The Helwig and the Cane-banana Rotation are the recommended types. The Helwig Rotation is usually completed in four years. A crop of Irish potatoes is first planted, then yams. These crops are followed by corm interplanted with red peas. Pangola grass (<u>Digitaria</u> <u>decumbens</u>) could be subsequently cultivated for two or three years.⁵⁶ This could be very useful on the hilly to mountainous terrain.

A cane-banana rotation would be more useful on the plains. An area could be devoted to one of these crops for four or five years, that is, until yield begins to prove uneconomical. Rotation of sugar cane and bananas is practised extensively on the Caymanas Estates in Saint

56 <u>Ibid.</u>, p. 20. Pangola grass is substituted for Wynne grass (<u>Melinis mintiflora</u>) because the former is hardy, high yielding, nutritive and in common use.

Catherine, Jamaica. It has the additional advantage of controlling the banana nematode (<u>Radopholus similis</u>). This rotation is only recommended for well-drained soil, particularly recent alluvium, and in areas where both crops can be grown commercially.⁵⁷ A good crop rotation system minimizes erosion and improves weed control and soil fertility.

B. Mulching

Mulching is "the covering of the surface of the soil with plant residue or other suitable material." It minimizes run-off, protects soil structure against deterioration resulting from the impact of raindrops, reduces evaporation, enhances water penetration in the soil and reduces soil temperature and the range of variation in soil temperature. Leaves of plants are the most valuable forms of mulch.⁵⁸

Formerly, the stalks and leaves of sugar canes provided valuable mulch and a rich source of humus. Burning has resulted in the reduction of this supply and an

57 Ibid. 58 Ibid.
increasing weed problem. Mulching is more applicable to small fields. Consequently, many small corn (Zea mays), yams (<u>Dioscorea</u>) and vegetable plots could benefit from this cultural practice.

C. Field Strip Cropping

A system of growing crops in roughly parallel strips across the general slope but not parallel to the true contour is "field strip cropping." "Strips of dense erosion-controlling crops are alternated with strips of clean tilled crops."⁵⁹ This method is less efficient than contour strip cropping but is probably more practicable for conditions in Westmoreland. The latter practice requires the surveying of slopes in order to define the contour strips. Very few residents are likely to pay the required surveyor's bill. However, field strip cropping, though economical, is only useful on regular slopes or on undulating land with no clearly defined slopes. Where physical conditions are suitable for this practice, soilconserving crops catch soil which erodes from the more intensely cultivated strips. Mulching and crop rotation

⁵⁹ Ibid., p. 3.

may be used to complement field strip cropping. Contour trenches may be cut and trees planted to supplement strip cultivation on steep slopes.

D. Vegetative Barriers

Vegetative barriers are rows or strips of plants established on the contour or across the slope. They may be temporary or permanent. Strip vegetative barriers are more effective soil conservation measures than single line or row vegatative barriers. Some of the more commonly used temporary barriers are Khus-Khus (<u>Vetveria zizenioides</u>) and Napier (<u>Pennisetum purpureum</u>) grass. Permanent trees such as mango (<u>Mangifera indica</u>), <u>Cupressus</u> and "quickstick" (<u>Cliricidia sepium</u>) may be used effectively.⁶⁰

A few simple agricultural practices and measures such as the reduction to a minimum of the burning of bush and grass, and afforestation of unproductive land and steep slopes, could promote soil and water conservation. In 1946, it was recommended that all slopes with a gradient over 45° should be retired from cultivation and be afforested, and that one chain (22 yards) from the summits of hills

60 Ibid., p. 3.

of this gradient should be reserved as watersheds.⁶¹ The government has been attempting to promote soil and water conservation to a limited extent. A statutory Watershed Commission was established. The Commission planned to develop the Cabaritta watershed in Westmoreland.⁶²

One problem is to secure greater participation of farmers in conservation. Legislation to restrict the use of land unsuited for immediate and economic agricultural development, education and subsidies to encourage conservation are solutions that can be attempted.

9. POPULATION PRESSURE ON THE LAND

The adverse effects of overpopulation on land use are common knowledge among geographers. Some of these are the demand for more agricultural acreage and more intensive and efficient land use.

...Jamaica has a density of 1050 persons per square mile of agricultural land, and nearly twice that figure per square mile of agricultural land excluding permanent grassland.⁶³

61 W. C. Lester-Smith, <u>Report on Soil Conservation</u> in Jamaica (Kingston, Jamaica: The Government Printer, 1946), p. 9.

62 Five-year Independence Plan 1963-1968, p. 103.

63 Gene Tidrick, "Some Aspects of Jamaican Emigration to the United Kingdom, 1953-1962," <u>Social and Economic</u> <u>Studies</u>, Vol. 15, No. 1, 1966, p. 25.

This density is high and if allowed to continue without effective control will aggravate the land use, unemployment and other social and economic problems already discussed.

In Westmoreland, the density on agricultural land may be somewhat less than the national average since extensive areas are in sugar cane cultivation. However, if the family planning programme does not prove successful, the population pressure on the land will be intensified.

CHAPTER IX

SUMMARY OF MAIN OBSERVATIONS AND CONCLUSIONS

In the preceding chapters, the discussions were based on the chief physical and human resources of Westmoreland, its major land use characteristics, the factors which tend to stimulate agricultural productivity and the forces limiting production. They examined the main problems as well as attempted solutions and made suggestions for the improvement of existing limitations. It is the object of the following paragraphs to summarize the main observations and to make some concluding remarks.

1. THE CHIEF PHYSICAL AND HUMAN RESOURCES

It is quite evident from the foregoing discussions that the chief resources of the parish are man and land.

Human beings are endowed with intellectual powers which should enable them to utilize the available physical resources effectively and efficiently. A major problem is the disproportionate number of people to the acreage of cultivable land. In brief, the parish is over-populated when one considers the low level of education, technology,

limited industrialization, high natural increase of population annually and the very unequal distribution of land. It appears as if the chief problem is over-population, which gets worse yearly. Unless population growth is minimized, it should not be expected that any substantial gains will be made by instituting reform programmes in education, or in increasing employment. This observation may appear to be pessimistic but it is based on an awareness of the limited availability of land and capital and the evidence of overcrowding. Educational institutions are overcrowded at all levels and the teacher shortage is Remedial programmes are hampered by the high severe. capital cost of schools and of books, maintenance costs and high property value. Although attempts have been made to improve the level of education, they have proved inadequate, partly because of the limited resources of the government and the additional thousands for whom new accommodation must be provided annually.

A similar addition of unskilled and skilled young people to the labour force each year intensifies the unemployment problem. Consequently, birth control appears to be the most important single solution to many of Jamaica's socio-economic problems.

Unfortunately, it was only recently that a birth

control programme was implemented, and costs, religious beliefs and the low level of education are major limitations to its full implementation.

The presence of many people, with the potential to adapt to change, is an asset which should not be underestimated. This potential asset becomes a liability when the quality needs to be upgraded and if the number is disproportionate to the available resources. The latter unfavourable tendencies are apparent in Westmoreland where historical factors, lack of capital and an inadequate supply of land complicate the problems.

Slavery, a historical factor, had its adverse effects on the sector of the population which can least afford to survive without manual work. The unskilled and least educated are unwilling to perform manual tasks. This has a multiplier effect since it discourages employment in agriculture, deprives the needy of a subsistence income, and farmers of employees. Manual work is likely to become accepted as the level of functional literacy is raised, a better-than-subsistence wage is paid to the unskilled employee and the attitude to manual work improved.

Fertile land is in short supply. The very unequal distribution aggravates the shortage. Some of this land is under-utilized and unsophisticated cultural practice

has caused a number of slopes to be badly eroded. Hereditary land tenure and the sale of small parcels have resulted in fragmentation. There is some hope that the new Land Reform Programme may modify these problems.

2. MAJOR LAND USE CHARACTERISTICS

The major characteristics of land use in Westmoreland are the dominance of plantation agriculture on the low-lying, fertile alluvial plains and valleys and the distribution of peasant farms on the hilly-to-mountainous terrain. This land use pattern is partly historical and geographical because the flat lands are nearest to the coast and were more accessible than the hilly interior. Consequently, they were the first to be settled by Europeans. Geographically, they satisfy the ecological and technological requirements of sugar cane (<u>Saccharum</u> <u>officinarum</u>), the main crop.

Settlement is widely distributed on plains and hilly areas. Nucleated and linear villages are common in both areas. Road-junctions form the core of many nucleated villages. Linear settlements are mainly along roads. The main centres of settlement are on the plains but some upland basins such as Darliston and Bethel Town are densely populated. A close relationship exists between settlement and farms although many small farmers have to travel some distance to one or more plots. Horticulture is sometimes practised on small plots in major settlements. In most cases, homesteads occupy sites as near as possible to the road frontage.

Agricultural land use has been the main emphasis of previous chapters. A case study of the Frome Estate revealed that the major characteristic of the plantation system is its utilization of labour under management supplied by the factory. The Corporation is very complex and specialized. Its chief products are sugar and the byproducts, but livestock production is also important.

In addition, the more advanced technology, superior management and the greater availability of capital are major differences between the plantation system and other types of agriculture. Because of the larger scale, plantation agriculture benefits from economies of scale.

There are similarities between the Frome plantation and large private farms. Both types have the same general labour, price fluctuation and cultural problems. They are located on the more fertile soils. All the large sugar cane cultivations are on the plains or in the basins where mechanical tillage is possible. The Frome Estate

possesses the greatest potential for solving the problems connected with land use but other large farms also have much influence. Fluctuations in the price of export product depend on external factors. Consequently, the price of sugar is not influenced by the local producers but by the demand for world sugar.

Farming on hillsides is inescapable because of the topography of the parish. This will not be changed but can be improved with better results. Cultivation on slopes is characteristic of small farming. These farms are characterized by a mixture of crops, small acreage, manual tillage and unsophisticated agricultural practices. Their weaknesses can be corrected by using the Government Land Settlement Schemes as the instrument of agricultural change. In order to achieve this, more careful attention must be given to the location of the schemes, the selection of settlers and the provision of essential services. Site and situation of each settlement should be considered, such as proximity to urban centres which are potential markets for crops, the suitability of the site for intensive cultivation, and the possibilities of installation of essential services such as water, roads and electricity.

A selective scheme should be programmed to select skilled farmers who will reside on the settlements. The

conditions under which participants are accepted such as residence, full participation in agricultural education projects and co-operative marketing schemes should be clearly stipulated in a contract.¹ With the controls discussed previously, it should be possible to develop stable agricultural communities which would serve as models to the neighbouring settlements.

It is obviously impractical to increase the fragmentation of land although there is the problem of unequal distribution. The Government's plan to create small farms of approximately 5 to 14 acres reveals some awareness of the problem and may provide the desired higher income for farmers² if the sites are carefully chosen and the settlements are efficiently controlled.

3. FACTORS TENDING TO INCREASE AGRICULTURAL PRODUCTIVITY

The statutory agencies, private bodies and the Government are the chief factors other than the farmer whose

¹ Walters, <u>op</u>. <u>cit.</u>, pp. 167-168.

² <u>Five-year Independence Plan 1963-1968</u>, p. 116. An average net income of L8 or L9 per holding each week in addition to the benefits from subsistence crops to the farmer and his immediate family was stated as the attainable objective. activities tend to stimulate productivity and production. They provide stimuli through their research, credit facilities, marketing and the agricultural education of Farmers are taught proper agronomy and livestock farmers. management at demonstrations, training days and short courses. Some research knowledge is channelled into the island from abroad via the Ministry of Agriculture and Lands agronomists and livestock officers to farmers. Local research discoveries pass through these channels as well as other private bodies. As a result of research, the loss of production from pests and diseases is reduced, greater yields are obtained, more resistant varieties of plants and animals are developed, and better management is implemented on farms. Farmers who put into practice the knowledge derived from research tend to experience greater productivity from their crops and to improve their standard of living.

Easy credit needs to be extended to farmers to a greater extent than is currently available. Much depends on the Government's policy, priorities and revenue.

An important step has been taken to improve marketing by the establishment of the Agricultural Marketing Corporation. More small farmers need to utilize this facility.

Agricultural education has been improved but there still remains a shortage of qualified persons to educate the farmers. The extension services could be co-ordinated to a greater degree to use the available supply of agricultural officers more effectively.

4. THE FORCES LIMITING PRODUCTION

The main forces limiting production are the low man-land ratio, lack of capital and improper cultural practices. Improper cultural practices are partly the result of historical and present factors. Most of the population is of African origin and many of their unsophisticated agricultural practices have been passed through the generations without significant changes since slavery. Because of limited knowledge, farmers fail to improve practices such as slash and burn agriculture, limited application of fertilizer and poor agronomy and animal husbandry. The effects of a low level of education and limited research on the crops which small farmers produce are aggravated by lack of capital.

Since emancipation, the majority of the male peasants are subsistence farmers who supplement their income with part-time employment on the Frome Estate or on the

farms of their neighbours. Female partners and senior members of their families serve as household help, assist on the farms and work at odd jobs. These marginal means of livelihood have never been sufficiently remunerative to allow any substantial accumulation of capital among Consequently, the supply of capital is peasant farmers. inadequate for the attainment of a desirable standard of animal husbandry and agronomy on these farms. The size of the farms which they are able to purchase, rent or lease is often inadequate to afford full employment or sufficient The effects of these unfavourable conditions are income. the frustration of small farmers and the lowering of Since soil nutrient is extracted by the production. plants annually and fertility is seldom restored by the addition of artificial or natural fertilizers, the tendency is toward decreasing productivity. Farmers complain that the yields are not as large as they were in former years. Some crop acreages decrease as youths migrate from the non-viable farm units in search of "greener pastures" in the towns.

At present, the small farmer in Jamaica shows little pride in his occupation, and this lack of pride in his occupation is a hindrance rather than a help to agriculture. He must somehow be taught that land cannot produce well if it is not properly utilized. The land should be viewed as a national asset and not as a private

commodity to be used in whatever way one pleases.³

This statement focuses attention on the previously discussed topic of "attitude to manual work." The problem is what can be done to improve attitudes resulting from centuries of historical experience and chronic low wages. Solutions are evidently not easy, and they are costly and require much time to be effective. It is common knowledge that farmers are generally conservative and this conservatism tends to be greatest when people are less educated. Consequently, previously suggested remedies such as intensified farmer education and model farms on Land Settlements are likely to proceed slowly but could be effective with time. Other solutions such as the increasing of farm wages and machinery in areas where this is possible and economical, offer much hope in conjunction with the educational improvements. However, much will depend on the gross national product of Jamaica to provide the capital, and the will of the population to accept changes.

³ Walters, <u>op</u>. <u>cit</u>., p. 172.

5. MAIN PROBLEMS AND SOLUTIONS

A. <u>Main Problems</u>

It is the author's view that the main problems of Westmoreland are inseparable from those of Jamaica as a whole and may be listed in a probable order of importance as follows:

- 1. Over-population and its socio-economic ills.
- 2. Limited supply of arable land because of mountainous topography.
- 3. Lack of capital to finance major projects because of limited natural resources and partly because of colonial exploitation and exportation of national assets.
- 4. Under-utilization of physical and human resources.
- 5. Very unequal distribution of land, wealth and income.
- 6. Over-dependence on staple products which are subject to the vicissitudes of the export markets.
- 7. Weaknesses in the domestic marketing system.
- 8. Unfavourable attitude to manual work.

Many of the above problems have been discussed and are inter-related. Therefore, they will only be discussed and correlated in summary.

Socio-economic disadvantages of over-population

are unemployment, under-employment and the inability of the Government and social agencies to provide adequate services such as education, water supply, roads and housing. Farmers fail to obtain desired assistance for improved soil and water conservation measures, education and grants for special projects such as piggeries, cattle sheds and development programmes. Probably the most severe problem The limited acreage cannot support is population pressure. the increasing population. Consequently, "push factors" such as reduced income, over-crowding of farmstead and lower standard of living force the young to migrate from "Pull factors" from the towns such as the social the farms. amenities, better education for children, and the belief that a cash income is readily available also attract migrants from rural areas.

The adverse effects of over-population are interrelated with the limited natural resources and the lack of capital. The Government does not have enough revenue to implement fully many of its programmes. As a result, they are delayed.

One weakness of colonialism is that much of the profit from investments in Jamaica was transferred overseas. Large banks, businesses and insurance corporations continue to send much of their profit to the head offices

in foreign countries. Legislation since independence might have modified this but the adverse effects on the shortage of capital have not been totally obliterated. Lack of important mineral deposits other than bauxite, and reliance on primary industries limit Government revenue.⁴ The very limited supply of electricity produced from hydro-electric plants compounds the revenue problem. Most profits are derived after refinement of bauxite into aluminum and the subsequent use of the latter product to produce goods. Since the refining and processing of this product involves great energy consumption which Jamaica lacks, most of the profit is made by foreign countries which purchase the ore. Partly for these reasons, the island has not been able to finance its agricultural and social projects without borrowing and deficit spending. Over-population increases the demand for services and will stimulate further deficits if agricultural production does not increase.

Continuous and inefficient usage reduces the supply of land relative to demand as the population increases. The increased population could be absorbed in industry

⁴ No buaxite ore in commercial quantities or any other mining operation take place in Westmoreland, except quarrying for building stone.

but Jamaica lacks heavy industries such as petroleum, iron and steel to support them. Westmoreland, for example, offers little possibility for industrialization except for the industries dependent on agricultural products described in "Industries Connected with Agriculture." It is obvious that the swamp lands of Westmoreland and the tourist potential of the Negril Development area are underutilized. The vegetable lands of the Great Morass require immediate attention. Suggestions have been made for their improvement (The Economics of Rice Production). Political rivalry should not prevent improvements for the general good.

The main weaknesses of the marketing system are insufficient storage, lack of refrigeration facilities and price fluctuations which result in periodic low prices for agricultural products. Local aspects of the marketing problem may be easily modified if the capital is available. However, where price changes of staple products result from world market conditions, Jamaica's influence is limited.

B. Solutions

The solutions to the socio-economic problems are birth control, better education and more efficient and

intensified use of the available resources. The Government is considering cumpulsory education and efforts are being made to improve agricultural training and attitudes. Legislation to improve land tenure by lengthening lease and rent periods; incentives such as subsidies and prizes to farmers who practise soil conservation; afforestation schemes, development of special projects such as rice production and the Negril Development Area, the enforcement of the Praedial Larceny Law, legalization of land titles and availability of easier credit to farmers are possible solutions to the chief problems. Some of these suggestions will require time for experimentation and subsequent implementation.

In conclusion, one must admitthat some of the new policies such as the birth control programme, land reform, improved agricultural marketing, a greater emphasis on crops for the domestic market and more intensive agricultural and academic education offer immense potential for the improvement of the economy and the standard of living. It is hoped that they will be effectively implemented with dynamism, fortitude and wisdom in the interest of the greatest number of Jamaicans.

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APPENDIX I - QUESTIONNAIRE

<u>Adu</u>]						
1. 2. 3. 4. 5. 6. 7. 8.	Number Number Size of Age of Marital Occupat Other s Educati reach Did you Schoo Ethnic of th a) Afr b) Afr c) Afr d) Eas e) Eur f) Chi	of peop family farmer status ion ources onfor ed in s go to l of Ag origin- e follo ican o-Europ o-East t India opean nese	le in farm h (if any) of income m or standar chool the Jamaica riculture? -check one wing: () ean () Indian () n () ()	nouseholo	1	
9. 10.	Ser Were yo If no:	u born a) How t b) Whe c) Wha	in this dist long have y his land? re were you t was your o	trict? you been living boccupatio	(Yes) cultiv before? on	(No) ating
<u>Child</u> 1. A	<u>iren</u> Age, sex	and ed	ucation (use	number))	
	Boys	Age	Standard or Form	Girls	Age	For
	2. 3. 4. 5. 6. 7. 8. 8. 9. 10. <u>Chilo</u> 1.	<pre>2. Size of 3. Age of 4. Marital 5. Occupat 6. Other s 7. Educati reach Did you Schoo 8. Ethnic of th a) Afr b) Afr c) Afr d) Eas e) Eur f) Chi 9. Sex 10. Were yo If no: Boys</pre>	2. Size of family 3. Age of farmer 4. Marital status 5. Occupation 6. Other sources 7. Educationfor reached in s Did you go to School of Ag 8. Ethnic origin- of the follo a) African b) Afro-Europ c) Afro-Europ c) Afro-East d) East India e) European f) Chinese 9. Sex 10. Were you born If no: a) How t b) Whe c) Wha t Eoys Age	<pre>2. Size of family (if any) 3. Age of farmer 4. Marital status 5. Occupation 6. Other sources of income 7. Educationform or standar reached in school Did you go to the Jamaica School of Agriculture? 8. Ethnic origincheck one of the following: a) African () b) Afro-European () c) Afro-East Indian () d) East Indian () f) Chinese () 9. Sex 10. Were you born in this dist If no: a) How long have y this land? b) Where were you c) What was your o there? </pre>	<pre>2. Size of family (if any) 3. Age of farmer 4. Marital status 5. Occupation 6. Other sources of income 7. Educationform or standard reached in school Did you go to the Jamaica School of Agriculture? 8. Ethnic origincheck one of the following: a) African () b) Afro-European () c) Afro-East Indian () e) European () f) Chinese () 9. Sex 10. Were you born in this district? If no: a) How long have you been this land? b) Where were you living c) What was your occupatio there? Children 1. Age, sex and education (use number Boys Age Standard Girls</pre>	<pre>2. Size of family (if any) 3. Age of farmer 4. Marital status 5. Occupation 6. Other sources of income 7. Educationform or standard reached in school Did you go to the Jamaica School of Agriculture? 8. Ethnic origincheck one of the following: a) African () b) Afro-European () c) Afro-European () f) Chinese () 9. Sex 10. Were you born in this district? (Yes) If no: a) How long have you been cultiv this land? b) Where were you living before? c) What was your occupation there? Children 1. Age, sex and education (use number) Boys Age Standard Girls Age </pre>

	2.	Did any go to the Jamaica School of Agriculture?								
	3.	How many of your children are doing other jobs than farming? Where?								
		Type of job								
	4.	Do you think your children will stay on the farm? If no, why don't you think so?								
	5.	Would you like them to stay on the farm? (Yes) (No) Reason								
II.	Far	<u>em</u> a se a companya de la companya de								
	Α.	General								
	~~ •	1. Size of farm?								
		2. Do you own, rent or lease this land?								
		3. Total acreage a) owned								
		b) rented								
		4. Have you bought any land recently?								
		5. Have you sold any land recently?								
		lend in this district?								
		7. Do you practice grop rotation?								
		8. Have you abandoned or changed any of the								
		original land uses?								
		9. Any electricity on the form? (Vec) (No)								
		10. From where do you get your water supply?								
		11. Sanitary convenience (pit) (sewage)								
	_									
	B.	Production								
		1. Types of crops and acreage Square Chains Acres								
		a) Sugar cane								
		b) Grass								
		a) Bananas								
		c/ Ground provisions f) Dimento								
		citmis fruits								
		h) Coffee								
		1) Others								
		j) Permanent tree crops. Types								

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		2.	Liv	estock					
			a)	Dairy	or beef	cattle			
			b)	Name o	r preed			<u>Aba ta a</u>	A
			•)		- *** -**	7 4 4	square	chains	Acres
-			C)	Acreag	e in cu	TCT			
			۹۱	Value	a pastu o in un		-		
			α)	Acreag	e in un d poetu	CUICI-			
			رم	Value Turna a	f moss	T.G.		مى م	
			e/	Lype 0	i grass				
			f)	Number	of the	follow	ing live	stock ow	ned:
			- /	(1) B	eef cat	tle			
•				(2) D	airv co	WS			
				(3) G	oats			Type	
				(4) H	ogs			Type	هيد بيريد الن التراديد بيريد بالتقاط
				(5) H	orses			Type	
				(6) P	oultry			L'Abe	
				(7) 0	thers			• - •	
1			g)	Are an	y used	as draug	sht anim	als?	
			_	Type _					
		C. <u>Y</u>	ields						
		1	. Su	gar can	eton	per ac	re		
		2	. Ri	cebag	s per a	ore			
		3	• Ba	nanas	stems p	er acre			
		4	• P1	mento	bags pe	r acre			
		5	• WN	at prop	ortion	oi the t	total pr	oauce ao	you
		6		unink i	s useq 	In your		~~	
		0	• ту	he brou	uced 10	r use I	I the no.		
				•	مىسۇرىيە كىلەكتىرىنىي مىيورىدىي		<u></u>	ان میں 1000 (1000 (1000)) ک ور میں اور اور میں میں اور	
	III.	Labo	ur Su	pply			·		
1		1.	Numbe	r of pe	rmanent	employe	es othe	r than m	embers
			of	your fa	mily al	ready na	amed		
		2.	Do yo	u emplo	y any s	easonal	labour?	(Yes)	(No)
			Numbe	r emplo	yed				
		3.	Have	you any	labour	problem	18?		
			ور ، و بدا کالگیرسینید:	الماريين المراجع					
	Υ								
		4.	Sourc	e of la	bour su	pply	ويوسيها والمراجع ويواد الهو		
	TV-	Farm	Mach	inerv					
		1.	Which	of the	follow	ing are	done man	nually o:	r by
		-	mac	hine?					v

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Manually Machines How often yearly? a) Tillage b) Weeding How often yearly? $\dot{()}$ c) Fertilization How much per acre?) (2. Do you own any farm machinery?_ Type 3. What machinery is rented? Kind 4. Does the Agricultural Development Corporation supply tractors to till your soil?_ 5. What other sources supply you with machines for tillage? 6. Cost of tillage per acre: a) A.D.C. b) Private tractors c) Manually d) Others V. Uncultivated Land 1. Acreage 2. Reasons for non-cultivation VI. Market 1. Who What products do you sell to the following: a) The Agricultural Marketing Corporation? b) The Jamaica Agricultural Society? c) Local buyers? d) Kingston buyers who visit your district? e) In Kingston (by going there yourself or by sending relatives)? f) In Sav-la-Mar? g) In Montego Bay? h) In Black River? i) In Lucea? 2. To which of the above buyers do you sell the greatest quantities of your agricultural products?

VII. Financing

1. Have you ever made loans for improving your farm

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	from the People's Co-operative Banks?
	2. what other sources supply you with farm toans?
	3. Did you use the loans for any of these purposes?
	b) Reaping ()
	c) Purchasing seeds ()
	e) Digging wells ()
	f) Purchasing livestock () c) Remaining on constructing dwelling (P) (C)
(jakarana kari tér	h) Purchasing fertilizers ()
	VIII. Farming Education
	What assistance do you receive from the following on
uniem, na observice Liniem, na observice	your farm (e.g. training, guidance, seeds, fertilizers)?
	1. The Jamaica Agricultural Society
	2. The Ministry of Agriculture and Lands Extension
	Service
	J. The nice glowers. Association
	4. The Westmoreland Cane Farmers' Association
	5. The Citrus Growers' Association
	6. Are you a member of any of the above Associations?
	(Yes) (No) If no, can they be of any help to
	you or your neighbors? Wny?
	IX. Services
	1. Which towns or districts do you visit for the following:
	groceries clothing
	furniture theatres seed/fertilizers doctors/dentists
	2. How often do you visit the following towns
	each year? a) Montego Bay — Reasons for visits
y 1910, décar este 1997 - Statistica Statistica 1997 - Statistica Statistica	b) Winneter
	D) Kingston Heasons for visits
	c) Sav-la-MarChief reasons for visits

3. Check mark the form of transportation used most often to the centres visited above:

car () bus () train ()
truck () Macaulay's Transport () diesel ()
How long does it take and what is the transportation
cost from your home to these towns? (Give
 answers to the ones used above only.)

			Cost	Time
	8	a) Bus to Kingston		
		D) TRUCK TO KINGSTON		
		1) Diesel to Kingston		and the second secon
	(e) Truck to Montego Bay		
		f) Bus to Montego Bay		
	Ę	g) Macaulay's to Montego Bay	<u>، «روب می اور اور اور اور اور اور اور اور اور اور</u>	وجيدي بجميع الأقوي والشراب
	1	1) Bus to Sav-la-Mar		
)) Mini-vans to Sav-la-Mar		
X.	Pro Exp. cl	<u>blems</u> Lain in what ways any of the follow hief problems as a farmer:	ing are yo	ur
	-L ÷	TADOUL SUDDIA		
	2			
	£- \$	Price of the products you sell		
	<u>ه</u> ب	Price of the products you sell		
	3.	Price of the products you sell Marketing of goods		
	2. 3. 4.	Price of the products you sell Marketing of goods Transportation costs		

5. Others

6. How do you hope to solve these problems?

XI. Trends

4.

1. What do you believe are the chief trends in farming in Westmoreland?

2. Have you any reasons for thinking as you do?_____

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 XII. Settlement

 1. Number of rooms

 2. Building material

 a) Wood

 b) Concrete

 c) Other

 3. Pattern of farmstead

 XIII. Other Information

APPENDIX II

FEMALES, POPULATION, 15 YEARS AND OVER, CLASSIFIED BY STANDARD OF EDUCATION ATTAINED, AGE AND PLACE OF RESIDENCE (WESTMORELAND)

	-			PARISH	AND STA	NDARD OF	EDUC	ATION		
AGE GROUPS	Westmoreland	TFN	Under 2 years Non-secondary	2 - 3 years Non-secondary	4 - 5 years Non-secondary	6 - 8 years Non-secondary	Jamaica Local 2nd and 3rd year	Without Sch. Cert. Secty.	Sch. Cert. Secondary	Degree
Total 15+ years	32,231	6,823	227	2,175	7,179	14,390	518	529	369	21
15 - 19	4,980	378	20	201	937	3,062	135	189	58	a a
20 - 24	4,170	605	27	228	882	2,143	133	84	67	2
25 - 29	3,670	645	26	285	900	1,608	82	65	55	Ц
30 - 34	3,085	624	23	220	714	1,380	49	27	46	2
35 - 39	2,996	644	24	221	721	1,275	22	30	50	3
40 - 44	2,540	629	21	174	59 5	1,053	21	21	23	1
45 - 49	2,388	688	15	198	578	950	22	19	16	2
50 - 54	2,251	674	20	204	493	794	25	23	15	3
55 - 59	1,552	465	20	133	347	542	16	14	14	1
60 - 64	1,398	475	14	105	330	443	3	19	7	2
65 - 74	1,682	556	13	104	364	612	5	15	12	1
75 - 89	1,233	370	4	87	276	465	5	21	5	ගම සො
90+	186	70		15	34	64	e s #3	2	1	

West Indies Population Census 1960, Bulletin No. 20, p. 75.
APPENDIX III

MALES, POPULATION, 15 YEARS AND OVER, CLASSIFIED BY STANDARD OF EDUCATION ATTAINED, AGE AND PLACE OF RESIDENCE (WESTMORELAND)

				ويرد المتحديد فينتبار الأكاف الأرجعية فا		ويستعادنا أشتكان وسيعت والتقال					
			1	ARISH A	ND STAN	IDARD OF	EDUCA	TION			
AGE GROUPS	Westmoreland	Nîl	Under 2 years Non-secondary	2 = 3 years Non-secondary	4 - 5 years Non-secondary	6 = 8 years Non-secondary	Jamaica Local 2nd and 3rd year	Without Sch. Cert. Sec'y.	Sch. Cert. Secondary	Degree	
Total 15+ years	29,461	8,180	216	2,354	6,419	11,118	302	424	318	58	
15 - 19	4,701	748	17	318	1,081	2,299	57	131	50	800 800.	
20 - 24	3,617	740	27	311	835	1,485	67	77	54	1	
25 - 29	3,107	850	28	250	677	1,165	34	42	52	9	
30 - 34	2,731	743	22	240	630	991	27	31	36	11	
35 - 39	2,812	797	18	210	613	5,094	16	28	27	9	
40 - 44	2,615	782	17	249	585	90 <i>5</i>	20	28	24	. 5	
45 - 49	2,566	863	21	239	548	816	35	23	14	7	
50 - 54	2,250	847	15	189	463	679	13	18	21	5	
55 - 59	1,645	555	18	145	354	540	14	9	7	3	
60 - 64	1,256	483	11	84	264	380	6	13	9	ang ang	
65 - 74	1,284	463	8	70	250	451	6	13	16	7	
75 - 89	803	280	12	45	157	285	7	8	8	l	
90 +	74	29	2	4	14	22	en ca	3	49	403 CD	

<u>Ibid</u>., p. 79

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APPENDIX IV

VEHICLES OF THE WEST INDIES SUGAR COMPANY, FROME, LIMITED

Vehicles used directly in production		····	
Туре	No	Туре	No.
Tractors (Wheeled and Crawler)	117	Jeeps	15
Locomotive (train)	7	Land rovers	38
Graders	4	Pick-ups	5
Road Rollers	2	Cars	9
Sugar trucks	10	Trucks (five ton)	5
Sugar cane loaders	3	Pumps (fire extinguishers)	2
Excavators	2		
Total	145	Total	74

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APPENDIX V

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		YEAR			Averages and net increase
	1965	1966	1967	Total	or decrease
Total tons ground	923 , 347。	921,737.27	770,822,00	2,822,166,41	
Farmers [®] tons cane delivered	520,687.52	530,987.35	414,665.45	1,466,340.32	488,780.11
Factory tons cane delivered	402,659.48	390,749.92	356,156.55	1,149,565.95	383,188,65
Factory % of total 1965 delivery	43 . 61%	42.31%	38.57%	124.49%	41.50%
Farmers [®] % of total 1965 delivery	56°39%	57 ~ 51%	%T6*77	158.81%	52.94%
Farmers' delivery increase or decrease as % of 1965 (delivery)	100 (base year)	¢1.12	-11.48	-10,36	-10.36
Factory delivery increase or decrease as $\%$ of 1965 (delivery)	100 (base year)	-1,30	-5.04	-6.34	-6.34
Minus (-) - Decrease since 19 Plus (4) - Increase since 19	965 965	(Ton	nage are long	tons - 2,240	1b.)

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(Cont ^td_o)

					Averages
		YEAR			and net increase
	1965	1966	1967	Total	decrease
Total tons 96 ⁰ sugar	106 , 545,32	99,475.21	84,854.91	291,075.44	97,025.14
Farmers' tons 96° sugar	58,941.308	57,397.83	45,205,00	61,544.138	53,848.05
LFactory tons 96° sugar	47,802,24	42,077.38	39,649,91	129,529.53	43,176.51
Farmers' % of total 960 sugar 1965	55.22%	53.77%	42.35%	151.34%	50 . 11%
Factory % of total 96° sugar 1965	44.078%	39.42%	37。14%	121.34%	40°45%
Farmers [†] 96 [°] sugar % increase or decrease of 1965	100 (base year)	-1.45	-12.87	-14.32	-14.32
Factory 96° sugar % increase or decrease of 1965	100 (base year)	-5.36	-7.64	-13.00	-13,00
Total tons of molasses	33,365.00	34,701.00	25,275.00	93,341。	31,113.67

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APPENDIX VI

SIX PHOTOGRAPHS OF OBSERVATIONS IN WESTMORELAND FROM JANUARY 22 TO FEBRUARY 11, 1962



1. Soil erosion resulting from the cultivation of slopes without soil conservation --Glen Brooke



2. Parish Council supplementing water supply at King's Valley during drought



 Frome Factory from main entrance. The train in the foreground is used to transport sugar canes, as well as supplies from one farm to the other.



4. Yam (<u>Dioscorea spp</u>.) plants on bamboo (<u>Bambusa</u> <u>vulgaris</u>) poles. The cultivation of yams on slopes without soil conservation stimulates soil erosion before their twining stems and leaves provide protection for the soil and immediately after harvest when the earth is partly bare of vegetation.



5. Banana plot on Shales at Seaford Town



 Fertile alluvial soils of the Great Morass. The dark colour suggests a high concentration of humus. Vegetables are grown on these soils.

(Photos 1 - 6 by S. E. Scott)

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APPENDIX

PROGRESS REPORT ON SOME PERMANENT, SEMI-PERMANENT SHORT TERM CROPS35

Grops	Date 31.3.66 Acreage	Date 31.3.67 Acreage	Increase or Decrease Acreage	Date 31.3.66 Production per acre	Date 31.3.67 Production per acre	Increase or Decrease Production per acre
Citrus	260	270	<i>4</i> 10	250 B	270	£20
Sugar Cane	30,500	30,800	€300	31 T	29	
Banana	1,360	1, 500	04114	3°5 T	3°5	1. B B
Coconut	250	300	¥50	2,500 U	2,,500	83
Coffee	260	300	440	30 B	30	
Cocor	200	715	415	16 C	J 6	8
Pimento	5,130	5,260	4130	8 8	7	4
Plantain	105	130	425	Э Ч	. M	l ŝ
Tobacco	115	100	-15	JI C	a a	1
Pumpkin	450	300	-150	5•5 T	4	= 1.5 5
Carrots	150	150) 8	1.5 T	1.7	40.2
35 Mi	nistry of Annual Rep	Agriculture ort 1966/67	end Lands E	ktension Servi	.ce, Westmore	land,
				boxes units	T - tons C - CWT	

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APPENDIX VIII

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NUMBER OF PARCELS, PERCENTAGE AND ACREAGE OF FARMS CLASSIFIED BY BASIS OF OCCUPANCY IN WESTMORELAND 1961

Farm Size	Inher	ited	Purchased		Squatted	
Percentage	Parcels	Acreage	Parcels	Acreage	Parcels	Acreage
Acreage of All Farms	4,379	42,968	9,280	100,503	242	278
Percentage All Farms	26.5	28.0	56.3	65.5	1.5	.2
0 to under 5	3,126	4,729	5,066	7,924	211	123
5 to under 25	1,056	6,149	3,536	20,205	26	148
Total 0 to under 25	4,182	10,878	8,602	28,119	237	271
% Small Farms (0 to under 25)) 26.9	25.5	55.3	66.0	1.5	0.6
25 to under 100	134	2,872	567	10,533	5	7
% 25 to under 100	18.1	20.8	76.6	76.6	0.7	.1
100 to under 500	39	5,492	67	13,365	and 100	
500 and over	24	23,721	44	48,476		
Total Large Farms 100 to over 500	63	29,213	111	61,841		
% Large Farms 100 and over	33.5	30.7	59.0	65.0	199 FB	

Department of Statistics, <u>Agricultural Statistics</u> <u>1961 - 1962</u>, pp. 95-99. (Percentages and subdivision totals were calculated by the writer.)

Cont'd.

APPENDIX VIII - Cont[®]d.

Farm Size	Rent	ed-in	Free		Tota	1
Percentage	Parcels	Acreage	Parcels	Acreage	Parcels	Acreage
Acreage of All Farms	2,151	7,029	444	2,770	16,496	153,548
Percentage All Farms	13.0	4.5	2.7	1.8	100	100
0 to under 5	1,809	1,409	337	295	10,549	14,480
5 to under 25	306	1,256	95	385	5,019	28,143
Total 0 to under 25	2,115	2,665	432	680	15,568	42,623
% Small Farms (0 to under 25)	13.6	6.3	2.7	1.6	100	100
25 to under 100	23	335	11	87	740	13,834
% 25 to under 100	3.1	2.4	1.5	0.6	100	100
100 to under 500	8	1,040	1	3	115	19,900
500 and over	5	2,989		¢aj (23)	73	75,186
Total Large Farms 100 to over 500	13	4,029	1	3	188	95,086
% Large Farms 100 and over	6.9	4.2	•6	.1	100	100

APPENDIX IX

WESTMORELAND PARISH COUNCIL SCHEDULE

OF MARKET FEES

	Past Fee	8	Present Fees (1968)
	Items		
1.	Beef	8/- per carcase	e 6/- per carcase
2.	Ground provisions	8d. in the Hl	6d. in the Ll
3.	Fruits	8d. in the Ll	6d. in the Ll
4.	Dry coconuts	1/6d. per bag	d. per bag
5.	New sugar	l/- per tin	9d. per tin
5.	Rice	8d. in the Hl	6d. in the Ll
7.	Tobacco	l/- per roll	9d. per roll
3.	Pork	(a) 2/- per carcase 100 lbs. and over	(a) 2/- per carcase 100 lbs. and over
		(b) 1/6d. per carcase under 100 lbs.	(b) 1/6d. per carcase under 100 lbs.

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