REPORT
on
SURVEY OF ST. AUGUSTINE - STRATHAM LODGE AREA
of
TRINIDAD
with particular reference to
PEASANT AGRICULTURE

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By
L. A. BRIDGLAND B. Sc. Agr. (Sydney)
DEPT. AGRICULTURE, STOCK & FISHERIES.
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D.T.A. REPORT
Special Contacts:

1. Sookai
2. Oli Mohamed
3. Ajincola
4. Rampahl
5. Dhéoli Singh
6. Jagat
7. Randeon
8. Samuel Brown
9. Kandaseed

Approximate Population
(including Streatham Lodge village not shown on map)
Estimated population = 400 People

Approximate Area
(including Streatham Lodge village) = 1600-1800 acres

Map not to any particular scale
(See soils for map to scale 1:2500)
FOREWORD

This is a report on an investigation set by the Agriculture Department of I.C.T.A., and is submitted as part requirement for the D.T.A. (Diploma in Tropical Agriculture).

Aim

The aim of the survey, results of which are contained in this report, was to study the life of the agricultural population in the St. Agustine-Streatham Lodge area, in order to provide a sound basis for a local agricultural extension policy. This thought has been at the back of the writer's mind throughout the survey and the idea that it was only an exercise on which one would be judged, soon disappeared owing to the absorbing nature of the work.

Lack of Reconnaisance

The carrying out of a survey of this sort presupposes that a preliminary reconnaissance to see what there is to be surveyed has been accomplished. This of course, was not so - and though there is no record of it contained in the body of the report, the first four or five months (during which little time was available) were spent in an attempt to gain the confidence of selected families and in imbibing the general atmosphere of the daily life. (This sometimes meant the imbibing of many other things, some undesirable and some which could only be regarded with suspicion).

Approach to Survey

The first striking observation was the extreme lack of uniformity in the economy of the population. Some were cane farmers, some were rice growers, some were provisions gardeners and others engaged in everything. A few people worked continuously for employers such as the neighbouring sugar estates and I.C.T.A., but most of the people either worked part time for an employer or were quite independent of wage earning for their livelihoods.

Some cultivators had over five acres of land while less fortunate individuals had no more than a house lot, moreover the degree of sub-division of the land varied considerably. With livestock the same variation is present. Some people had five or six head of cattle and some had none - cattle and bicycles were owned irregularly.

This heterogeneity went further than the economic aspects of their life. Several religions were concerned though Hinduism was by far the most important. Among Hindus, the four castes, viz. Brahmins, Kshatriyas, Vaishis and Shudras were all represented. The number of children per family varied from 0 to about 10.

In the light of these observations it soon became clear that the original intention of selecting representative families and studying such things as their income and expenditures would be quite impossible without sufficient staff to study at least 50 families intensively. Singlehanded, and with only short irregular periods available for the work, one could handle no more than eight families closely and these could by no stretch of the imagination be considered to be representative of the area. Besides there were too many other things to be surveyed to spend too much time on income and expenditure, important as these things are. e.g.,. The impression imparted by many people was that nothing could be said in favour of the agricultural practices of the people being surveyed they were presumed to carry on without any basic system and in a thoroughly haphazard manner. This view was soon discarded and it has been considered worthwhile to spend some little time in emphasising the fact that their cultivation of the land and management of livestock takes place according to definite interwoven systems. This interweaving of systems, plus the fact that the systems rarely involve definite crop rotations present a confusing picture to the casual observer. The systems might perhaps be handed down from one generation to another, but considering the difficulties they are faced, and the complete lack of instruction and guidance, the Indian gardeners of the area show considerable ingenuity and resource. From the extension point of view, these systems are of great importance because rather than attempting to start from scratch, the line of approach can be to modify and improve the existing systems. One has completed the survey with a profound respect for the people concerned and it is felt that even I.C.T.A. has something to learn from them.

The People

In trying to fix the limits of the survey in one's mind, other difficulties arose. With the basic idea that the people themselves represent the target of extension work, a sound knowledge of the people as they are - their society, religions, community life, customs, state of enlightenment, state of health etc. - fundamentally necessary. It would of been satisfactory to refer the reader to the writings of an anthropologist or sociologist on the subject, but for the fact that such writings do not exist.
NUTRITION With nutrition, one was more fortunate and as a result of a recent island-wide nutrition survey by the Dept. Health, a pretty fair picture of the state of nutrition of the Indians has been obtained.

Relevant information has been summarised in Part Five of this report, although it is felt that this link in the story is weak because general conclusions for Trinidad as a whole might not be very true for this specific area.

With regard to social structure, community life, religious customs and beliefs etc., one has been forced to take on the job of an anthropologist and only with reluctance has this been done. The first part then, on "The People", is probably fairly accurate as far as it goes (even this is not guaranteed) but it is not known how many vital points have been missed completely. If however, subsequent workers among the Indians do the same thing, a useful body of knowledge could be built up. (N.B. Studies of Indians in Trinidad are legion but the transplanting of Indians to Trinidad has wrought so many important changes that these studies are only of limited value).

Amenities The necessity of studying the more important amenities and services available to the population was quite plain and this part of the report is purely matter-of-fact.

Pestian Agriculture Then, a study of the agricultural economy involving land tenure, cropping systems and methods and use of livestock as well as the relationship of the people with the sugar estates, presented itself as the backbone of the survey.

And so the survey proceeded - the eight families providing a nucleus of information which was expanded by general observations and discussions with dozens of other less-well-known individuals. The eight families were extremely useful - they formed the tunnel through which one infiltrated into the (almost) everyday life of the farming population. They also provided personal information which could not have been obtained otherwise, for the Indians are extremely suspicious people until their confidence have been won.

Lack of "Master-Survey" Throughout the survey, one has suffered because of the lack of a general "master survey" along similar lines for the whole island. A localised detailed survey should fit into such "master survey" and not to be just the result of an unharness-spasm. Although there is much general information available in Trinidad, the facts relevant to agricultural extension have never been brought together and thoroughly collated. Thus, in this report, much space is occupied by "Historical Backgrounds" and a formidable bundle of appendices have been of necessity attached.

Importance of Survey A survey of this sort is just one phase of an extension programme. It is the fundamental phase because all subsequent extension activities will be based on a systematic attempt to solve the problems which are revealed by the survey. It not only indicates these problems but gives a clue as to the relative importance and by bringing the extension worker into intimate contact with the people, it breaks down many barriers in the way of access to the solutions which are ultimately found. In this particular survey, only part of the road has been traversed. Only the first milestone of indicating the problems has been reached. These problems should now (theoretically) be tackled on research stations - that is what they exist for. Then the new techniques should be carried back to the people of the area through demonstration farms, talks, films and other methods of propaganda. It is here that one feels frustrated because a job has to be abandoned when it has really just begun. It has been suggested that the College might accept responsibility for the extension operations in the survey area as part of its teaching of its agricultural extension. The survey will then be worthwhile from the point of view of the people of the survey area who have so far given a lot and received nothing in return.

Weaknesses of the Survey Some of the shortcomings are:

(1) Inexperienced handling of Part 1 on "The People".
(2) Lack of precise knowledge of crop yields in the survey area.
(3) Lack of precise knowledge of the variation of productivity of the different soil types.
(4) Absence of accurate data regarding the numbers of holdings in various size classes, "degree of scattering classes", etc.
(5) Absence of actual figures for the areas of different crops.
Acknowledgements

Many thanks are due to Prof. A. de K. Frampton who conceived the idea of having such surveys as part of the course, and who has been generous beyond good measure with his time and knowledge in assisting with the survey.

The Philosophy of Extension which runs through this report is not original. It is simply an application of the teaching in extension received from Mr. C. W. Lynn. Briefly, the relevant part of this philosophy is based on the prime notion that it is the welfare of the people which is the target. On this basis then, a survey is carried out to find just what the problems of the people really are - not what some crank thinks they are! It is then possible to arrange the problems in their order of importance, to formulate policy and to tackle "first ones first" on research stations. When the answers have been found (and tested thoroughly), they are carried back to the people by all manner of propagandising devices and will soon be accepted because they "fill the bill"; if they are rejected, it probably means that they do not fit. Another fundamental notion in carrying on extension work is that the infinite number of small improvements by the many is of vastly greater importance and value than the striking flash-in-the-pan improvements by a few; and however imperceptible the small improvements are, that in sum total they count for something which is of permanent and abiding value.

It is with profound thanks and apologies to Mr. Lynn that his ideas, rather hashed up, form the undercurrent of this report.

Of the others at I.C.T.A., one is indebted to Prof. C. Y. Shepherd and Dr. A. L. Jolly (who provided much verbal and written information), to the Chemistry Department (particularly Mr. W. Hewitt) for soil analyses and to the Botany Department for plant identification.

To Dr. Pound (Trinidad Department of Agriculture), Mr. Bowen (Census Officer) and to others who have assisted, not the least of whom were the numerous Indians in the survey area, grateful thanks are given.

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PART 1

- THE PEOPLE -

SUMMARY:

Background of the Indians.

Social Structure and Community Life
Uniformity of background
Residual effects of Caste-System.

Social Customs and Religious Beliefs
The Hindu Religion
Social and Economic obligations
The Moral Code
Effect on Agriculture
Modifications in Trinidad.

Marriages - Procedure, Expenditure, Position of
women in Home
Clothing, Language, Eating habits,
Housing and
Personal Characteristics.
There are but few people of African descent in the Survey Area (1). These justify no more than passing reference on this account, and are not agriculturists like the Indians but are usually clerks or taxi-drivers. They have a haphazard kitchen garden to supplement purchased food.

The great bulk of the population is Indian. By virtue of the reason of their importation, this race is dominant in the "cane-belt" which involves principally, the counties of St. George, Caroni and Victoria. It is therefore not surprising to find a concentration of Indians in the lower St. Agustine area and in Statham Lodge. (For actual distribution of the Indian population, its source, rate of increase and other trends, see Appendix A).

Background of the Indians. The origin and background of the Indians has a profound effect on their present outlook and circumstances. When slavery finally came to an end with the abolition of the apprenticeship system in 1838, followed later by the receding in England of a duty which discriminated against the import of slave-produced sugar, the position of the sugar industry in the British West Indies was extremely shaky. Either a cheap supply of labour had to be found or the industry was finished. Several sources were tried without success until the problem was solved by the importation of Indians under the indenture system.

The Indian: Indentured Labourers. The main sources of labourers were the provinces along the Ganges River. From Calcutta in Bengal, up through the Bihar Province to the United Provinces south of the Himalayas. The Madras area in south-eastern India was also an important source. The enlistment of people other than agriculturists was discouraged and regulations demanded 40 females for every 100 males. The three parties concerned in the movement were the Indians themselves, the Colonial Office (represented by the Trinidad Government) and the Trinidad cane-planters. Conditions were imposed on all three parties. The Indians were required to reside in houses provided by the employer to sign on for at least five years (three if a woman was brought) during which time they were required to do any work desired by the employer for six days per week and on termination of the contract to remain in Trinidad for another five years. During the latter period they could choose their own employer.

The employer was bound to provide accommodation in accordance with requirements defined by law, to provide rations and wages (25¢/day), to hospitalise and treat the labourers when and if necessary.

The third party, the British Government, provided transport for the indentures, guaranteed free passages back to India (ii) or alternately made land available to those desirous of remaining in Trinidad when their contracts expired. The Government was also required to make certain that the other two parties honoured their obligations. "The system provided the employer with an adequate, flexible and amenable supply of labour" (iii). The labourers in many cases obtained better conditions than those obtaining in the areas from whence they came; and by virtue of the fact that all castes became answerable to a higher authority viz. the Trinidad Government, the caste system as a basis for social organisation almost disappeared. The majority found a hitherto unknown freedom of economic activity. Many - too many in fact, took advantage of the offer of a block of land and thus became independent of work on the sugar estates. This, together with the fact that many thousands returned to India (iv) forced the Government to abolish the guarantee of a block of land. This early behaviour showed that the Indian was an independent cultivator and not a wage-earner by nature. That very few were able to purchase Crown land did not seem important until the Indian Government halted the indentured labourer traffic in 1917. Inward traffic of Indians ceased but the outward flow back to India continued and the previous condition of having surplus Indian labour was reversed. Development of the Oil Industry was another antagonising factor and Indian labour was in short supply from 1925-1929. Meanwhile the "cane-farming" industry became predominantly an Indian affair. (v) Cane-farming was encouraged by the estates because they profited by manufacturing the cane (produced at a lower cost than they themselves could produce it) into sugar and...
(1) Henceforth these are referred to as West Indians as opposed to East Indians. The latter refer to the West Indians as "Creoles" but this term more correctly refers any person of European descent born in the West Indies. In Jamaica the term "Creole" refers more to half-castes.

(ii) This applied only to people actually brought from India and to Indian children born in Trinidad.

(iii) From Agricultural labour in Trinidad" - Prof. C. Y. Shephard.

(iv) For actual numbers see Appendix A.

(v) See part 4, Section 3 and Appendix C.

because it was an attraction to Indians to stay rather than go back to India. To make this possible, large areas of estate land were leased out in small blocks to Indians; and needless to say, this practice suddenly increased after 1917 when it first became necessary to encourage the Indians to "stay put".

The realisation that they could not be summarily put off in favour of new indentured labourers gave the existing labouring population a bargaining power which was hitherto unknown and needless to say this has been exploited. Ultimately, the estates found that they could not depend on obtaining a regular and satisfactory supply of labour. This is evidenced by the riots of 1936 and other lesser disruptions; and although technological improvements in factory methods had previously been adopted, labour troubles have forced the estates into a program of mechanisation of sugar cane cultivation. The cane-farmers (mostly Indians) therefore no longer enjoy the position of being lower cost producers than the estates themselves and the resumption of land leased out to small-holders by estates, having already begun, is likely to take place on a larger scale in the near future. The drift of Indians into other commercial and professional occupations is accelerating but it seems likely that they will remain as the agricultural backbone of Trinidad for a good many years.

Social Structure and Community Life among the Indians.

This subject is intimately bound up with religion. Hinduism and the Mahomedan religions being the most important ones by far (1). So far as the survey area is concerned, Moslems are of little importance most of the Indians being Hindus by religion. Although Moslems and Hindus get on quite well together, they tend to segregate and form pockets. The few Moslems living in the survey area in Hindu communities have little interest in their religion.

The sources of the Hindus in India are so widely distributed that one might expect to find a considerable variation in customs, beliefs and social organisation but there is a considerable body of opinion to the contrary. "There is remarkable uniformity to be observed in the realm of culture and civilisation throughout the various provinces of India" ..... "Rules governing social and political customs, manners and institutions laid down in the Smritis were generally observed in village communities all over India until the Mahomedan period" ..... "Differences undoubtedly exist" (ii).

In Hindu communities in India, the basic factor in social organisation was the "caste system". There is traditional specialisation of function within each of four main castes. Each is associated with a varying social prestige (or social lowliness) which is associated with authority for the higher castes and subserviency for the lower castes. e.g.

1. The Brahmanas (Brahmins) are always the political and spiritual leaders.

2. The Kshatriyas (usually pronounced "Ghatri") are concerned with administration, defence, etc.

3. The Vaishyas (often referred to as Vaais or Dhais) are the agriculturists and are made up of many classes such as the "Kheri" who keep cattle, "Gariyas" who manage sheep and goats and the "Nasans" who do the actual cultivation work.

4. The Shudras (referred to as the Sudhr) are the souch or "Untouchables". These are concerned with burial of the dead, sweeping of the village, making of shoes etc.

Villages are made up of these four sects living in different areas. The Kshatriyas and the Brahmins live together and the Vaishyas and Shudras lived apart, both being on the leeward side of the Brahmins on the west of India.
Each village had a head-man (a Kshatri) or in some cases a village council. The headman was either appointed by a King or the office was hereditary. His duties were to organise the defence of the village, collect revenue, organise repairs to roads and drains, and to administer justice. He also represented the village at coronations and other celebrations involving many villages. As opposed to this set-up, "the village council was a more or less informal body of aristocratic elders who exercised their powers only when things were mismanaged by the village headman (iii)". Many northern and western Indian villages apparently also had an accountant to assist the village headman in matter of finance.

When a very varied Indian population is summarily uprooted and brought to Trinidad, the result is very different. First of all, it is very surprising to find either Brahmans or Kshatriyas in Trinidad because the work to be performed was far below their station in life. It would seem that even these castes suffer poverty at times and individuals who fell into disfavor would probably welcome an opportunity to escape. Many state that they were brought here on false pretenses - i.e. were told that they would be able to get rich quickly and return to India. This story has become almost legendary.

(1) For actual proportions see Appendix A.

(ii) "A History of Village Communities in Western India" - A. S. Altekar. The Smritis is an historical document pertaining to administration and law.

(iii) "A History of Village Communities in Western India" - A. S. Altekar. Among the present generation Indians. Actually there are very few Brahmans in Trinidad but there is a considerable population of Kshatrian origin. Most of the Indians belong to the Vaishyas but no one admits to being a Shudra. Those who are unaware of their ancestry probably mostly belong to this class. The actual proportions of these sects is not known.

The initial impossibility of village life, and emancipation from the caste system have meant that the Indian concentrations are without community organisation, spokesmen or indeed without any form of representation. The position does not look bright when it is said of India that "both Mullah and British rulers have found the village headman to be indispensable in village administration" (i). That nothing of the kind exists in Trinidad illustrates the complete artificiality of Local Government and until this position is rectified, agricultural and medical extension activities can never be carried out on anything but on an individual basis - a sad state of affairs. It is possible that these activities will be the best instruments for building up community organisations which could later form a basis for the election of village representatives. In the survey area, the Indians badly need a voice; and one is convinced that it would not be a difficult task to develop a co-operative organisation if for no more reason than for collective bargaining with landlords. The day when an Indian expects social standing by virtue of Kshatrian ancestry, or accepts lowliness because he derives from the Bhangis or Chamaras are fast disappearing. New factors in social prestige, and intermarriage between castes are responsible for this. Castes would not hinder cooperation.

It is true that in his economic activities the Indian is individualistic and independant but he is willing to accept help and advice (ii) though not interference. At the same time, the Indians are gregarious people. They like to have plenty of company and social intercourse. Isolation is not at all to be desired. This characteristic alone if cetered for (quite apart from their joint problems) would make the development of community organisations a not difficult task.

Social Customs and Religious Beliefs

The Hindu Religion (iii)

A detailed analysis of the Hindu religion is neither possible nor desirable (iv) but certain features affect agriculture directly and almost every feature affects it indirectly.
As found in India, there are apparently two sides to the Hindu religion: the first aspect is concerned with the social and economic obligations of the community and this finds expression in the "caste-system". An individual is not free to choose his mode of life but is committed to the profession of his father and his social status depends entirely on this. For each caste, the Hindu "Bible" or Veda (iii) prescribes the rules of action and behaviour which relate particularly to that caste. e.g. The Bhais receive an agricultural bias from Hindu teaching. The Kshatriyas (Sighs) receive a prestige bias and their sphere of administration and defense. The Brahmins are confirmed in their responsibility for spiritual leadership and are required to lead a life of holiness and piety. The Sudhr, on the other hand are commanded to accept their fate as untouchables and to respect, honour and obey the ruling castes.

The second aspect of the Hindu religion refers to a body of ethics and moral laws. This teaching forms an undercurrent through all castes and has quite a lot in common with Christianity. The moral code is concerned with man's relationship with God (i) or gods, his relationship with other men and with other things in his environment, such as animals (ii), plants and the soil.

The effects of the Hindu religion on agriculture are most important although the extent varies from caste to caste. Whereas the Brahmins, the Kshatriyas and the Bhais do not eat meat, the Untouchables do. Otherwise pigs would not play any part in a Hindu community. Cattle and Goths have other uses besides providing a potential source of meat, but the meat of both is also consumed by such "contemptible classes" as the Chamars (included in the Sudhr). The higher castes are bound not to take life at all. With plants, the pulling out of a weed is regarded as a sin unless by doing so the cultivator can produce two plants. Then his act is sanctified because there is a gain in life. The soil is regarded with utmost respect just as a mother is revered by her children. The extent to which this belief affects agricultural practice varies with the extent of the religious faith of the people.

On this basis, the Indians built up a long tradition of successful agriculture and fortunately for Trinidad, they prefer for the present, to continue in this tradition. The transplanting of Indians from India into a supposedly Christian country, or at least into a country whose laws represent to some extent the political corollaries of Christianity has had and is still having a profound effect on the interpretation of Hinduism by the Trinidadians. Whatever the reader believes about the question of Trinidad's economic future, that the island must have food, that large quantities of this food must be produced within the Colony and that the Indian population is by far the most important food-producer in the island, simply cannot be refuted. Since the Indians' agriculture is so intimately bound up with their religion (80% are Hindus), the fact that Hinduism is in a state of flux, deserves some attention to say the very least.

When the Indians came to Trinidad, it soon became obvious that it was the power of the higher castes and not the power of the religion itself which stabilised the caste system in India. It fell.

Footnotes for page 8.

(i) See footnote previous page.
(ii) Several examples of this are given in the final part of this survey.
(iii) There is certain confusion existing between two types of Hinduism. The true Hinduism was based on the Vedas which is in four parts:
  1. Rikveda - a general book on religious feelings, way to salvation etc.
  2. Samveda - songs of praises but has particular reference to agriculture.
  3. Atharvanvede - relates to astrology, etc.
  4. Dhyurveda relates to the methods of performing religious ceremonies.

The Vede (pronounced vade) classified people into those used their heads, those who used their hands to protect those using their heads and to administer policy, those who formed the trunk by feeding and clothing the two former, and those who used their feet and were simply a convenience for the others.

This was simply an attempt at classification but later, when the people known as the Purans overran the Hindus, they used this classification as a sanction for the caste system. They also super-imposed their own religion based on eighteen books making up the "Puran" on the previous Vedica religion. The latter people claim that they are the only true Hindus and dissociate themselves from Puranic Hinduism. The Puranic Hindus account for the vast majority of Hindus.

(iv) There are other religions in India which are represented to a slight extent e.g. The "Sevarains" who came mainly from the south of India are monotheists and have no caste system. Also the "Punjabese" and their "Sect" (lit. true-truth) are taught by some to be a disciple of Christ. They now adocate in Trinidad of these two re
to pieces in Trinidad when all castes became answerable to a higher authority. There was a partial revival after a time among some who had no desire to escape from the system or who feared retribution in one way or another if they did (iii); but even this is fast disappearing - much to the sorrow of the higher castes. The effect of this on social structure and community life has already been described but it resulted also in a revision of many other beliefs. The importance of the individual in a community was something which clearly needed revising. Lesser deities have tended to disappear, fatalism is declining and many other tenets are being re-oriented.

These changes are reflected in modifications of marriage celebrations, death ceremonies, language, clothing, eating habits, housing etc. But in spite of these changes, the Indians have remained racially distinct and are severely criticised for doing so (iv). However, had the Indians - the only people in the island with an agricultural tradition - internarrated and intermixed with the negro population, they would have lost their customary agricultural leanings and the position would probably have been very much worse.

But the changing of the Indians is coming inevitably even if slowly. Many of the changes will be for the better but if the Indians become ashamed of their old ways, how much longer will they accept their present agricultural position which up to the present has forced their old ways on them? The least of their tradition is retained by those who enter spheres of activity other than agriculture. Does this mean that the Indians will lose interest in agriculture? Yet the position is allowed to drift idly along, and the Indians receive no instruction, no encouragement and no guidance, only criticism.

Marriages

The Hindus have a special marriage season including the months of April, May and June and all weddings take place during this period. Just how these months were arrived at is not clear; but there are specified times for many religious festivals and the same months are known to be marked down for weddings, at least in parts of India. In Trinidad, the wedding season clashes with the cane-cutting operations and since marriages are not noted for a spirit of temperance, interference in estate crops commonly results.

The age at which marriage takes place is 13 to 16 years in the case of girls and 15 to 18 in the case of boys. There are many exceptions to this and several years ago, marriages at a tenderer age were much more common.

In days gone by, the marriage was arranged entirely by the parents of the children concerned and the latter had no say in the matter whatever. The onus was, and usually still is, on the girl's parents to approach the parents of a desirable boy and if satisfactory to both parties an engagement or "Teluck" will be announced. Then the girl is taken to her prospective father-in-law's house and receives three years tuition in household work by the prospective mother-in-law. Meanwhile the boy is not allowed to approach or to have anything to do with the girl. A decision would be reached as to the suitability or unsuitability of the girl and the marriage ceremony would take place according to one of several customary methods, the details of which need not concern us here. With the Hindus from Northern India the wedding takes place at the girl's father's house and the boy carries his wife back to his father's home until he builds a house of his own. With the Indians from Madras area called "Madurai", the wedding takes place at the boy's father's house after which the bride and groom go to the bride's home for a few days and then go back to the boy's home. The boy will build a home of his own later on.

The latter part of this ceremony remains basically unchanged to this day but the first part is quite out of date. The parents may still suggest a marriage between two children and although there are exceptions, these usually have the opportunity of giving each other a summary inspection and if the girl is satisfied with the choice, the suggestion of marriage is vetoed. Nowadays, the young people themselves are able to make suggestions. The modern Indian brides receive no preliminary training by their prospective mothers-in-law.

(1) "Ram" or "Om" is the chief God. "Letchman" is Ram's brother. There are special celebrations for different gods e.g. "Ramjeelah" is the name of a celebration for Ram and Letchman (Ram=God, Lelchman = God). If a show put on for god.

(II) Hindu beliefs are really mixed - an evildoer will return as a beast of burden, etc.

(iii) Many Indians of doubtful ancestry therefore claimed to be Brahmins and Kshatryias because they obtained standing if the bluff came off.

(iv) This will probably always be true while the Hindu temples (Bhala) and the Mahomedan temples (Mehajit) are a common feature in the Trinidad landscape.
Another important modern trend is for the young people to be married, not by a Hindu priest but at a registry office. This is thought to be more civilised. The social events accompanying the wedding are, even in this circumstance, strictly adhered to. The new-fangled registry office weddings are not at all popular among the older Indian people.

Expenditure on Weddings

Expenditure on these weddings is extravagant and although not widespread in the survey area, is a common cause of indebtedness among the Indians (1). Expenditure at a wedding is in three parts:

(1) Before the wedding (one week before), the bride's father hands over an amount varying from $30.00 to $500.00 (ii) but usually $50.00 to $80.00 to the bridegroom's father. This is to be used in purchasing jewels for his daughter and defraying part of the cost of the wedding. A considerable body of Indian opinion wants to see this part of the ceremony abolished.

(2) The second part of the expenditure covers the purchase of food, rum, hire of tent if necessary and the hire of musicians. Actually, the bride's father and the bridegroom's father invite guests separately and so far as food is concerned, cater for them separately. The groom's father pays for feeding his guests and likewise also the bride's father. Regarding a tent and seating accommodation, many Indians have grouped themselves into bodies called the "Apunch" and contribute sufficient money to purchase these things. There are 25-30 people in each group and any member can borrow the facilities for weddings and feasts etc., this is the only form of social organisation encountered. People not belonging to an Apunch must hire these facilities for a wedding.

In this phase of wedding expenditure, the bride's father will spend anything from $150.00 to $200.00 although amounts up to $500.00 may be spent. It depends on whether the feeding is for a few hours only, or whether it carries on for about three days. The groom's father will spend part of the money given to him as a dowry.

(3) On the morning after the wedding ceremony, the groom is seated in front of a bowl of rice with a plate in front of him to receive donations of money. The bride's father starts the ball rolling with $10.00 to $20.00 and then the guests invited by him contribute also. They give between $1.00 to $10.00 according to certain understandings. If the bride's father has attended a wedding arranged by any of these (and he will make a point of inviting them to his daughter's wedding) and contributed money in a similar fashion, they are then obliged to contribute at least an equivalent amount in return. Guests who have not already arranged to have their children married will contribute as much as they are able and then be in a position to invite the bride's father to a subsequent marriage of their daughter and have their contribution returned to them.

This phase of wedding expenditure would appear to be quite a good method of saving and of encouraging thrift.

Thus the burden of the wedding falls on the bride's father and although the cost sometimes reaches $1,000.00, such expensive weddings are becoming less common and for the most part the cost is from $200.00 to $300.00. It does appear that expenditure on weddings is becoming reduced in relation to total annual income. Prof. C.L. Shephard records that the expenditure on a wedding was roughly equal to one year's income in 1936. It is usually about half of one year's income at the present time.

P (1)

Father-in-law places hand on son-in-law's head as part of the marriage ritual. Priest is framed under the outstretched arm.

P (2)

A marriage occasions much drumming as well as singing. Dancing was once common but a certain looseness has caused it to be discouraged.

(i) This is largely because Hindu religion prescribes that no religious ceremony should take place on borrowed money. It is said that all the credit for the performance would go to the moneylender and not to the borrower. In spite of this, some borrowing does take place and registry office weddings are regarded as being exempt from this ruling. In any case borrowing may result after an Indian wedding if the expenditure has been excessive.
in the Hindu religion, man is superior to woman and the latter must take orders from their male masters. For the most part, women are simply slaves with additional female responsibilities. In fairness to Hinduism it should be stated that the religion preaches tolerance, understanding and a free forgiveness in man's relations with women, apart from other things; but this attitude is not practised very widely. A phenomenal amount of wife-beating takes place especially after a bout on the rum-bottle.

Indian women have had their position improved in Trinidad. Formerly, no widow or divorced woman (indeed divorce was not possible) was allowed to re-marry under the old Hindu laws. The possibility of divorce and re-marriage at a registry office has made it possible for a woman to hold a man to ransom and relationships between the sexes have become much more liberalised so far as women are concerned. This relationship is of great importance to extension work.

Clothing The gradual changing of Indians away from their traditional way of life is termed "creolisation". With clothing, the Indians have become very much creolised. The customary loin cloth of men is still used by the older people to some extent but has been quite abandoned by the younger generation. Women's dress has perhaps been less changed except in wealthy houses where European clothing and embellishments are used. The latter are very much opposed by the Hindu religion. To put a permanent wave in women's hair is outright sacrilege. Shoes have been adopted by both sexes. On the whole clothing is used for showing-off and the children running around with shirts and no pants in bare feet shows that the idea of protection is purely secondary in importance.

Language The remainder of the last indentured labourers who arrived in 1915 can barely speak English and even the children born in Trinidad can only speak a particular Trinidadian type of English. This is at first, more or less unintelligible to the visitor albeit his own English may have its own particular flavour. Most of the older Indians can still speak the native language, Hindustani being the most important of these. The Madrasis have their own language. These languages have tended to die out and although many children can read Hindustani they are not articulate in its use. That the Indians wish their language to survive is indicated by voluntary classes which are being started by them. One operates four nights a week in the St. Augustine area and another is going strong in Tunapuna. In St. Augustine an old club house was repaired, voluntary teachers obtained and certain nights were set aside for the teaching of Hindic. The children, who have already been to the Government school during the day attend for 1½ hours at night.

Eating Habits Cooking is done over clay fire-places which are built on the ground and usually in a small detached hut just off the house. Bamboo is used for fuel as well as some hardwood (i). Bamboo is preferred for its ease of splitting and because it produces a hot smokeless fire and leaves very little ash. The three meals of the day are referred to as Tea (our breakfast) Breakfast (our lunch) and Tea again (our dinner). A large cook of rice and roti is carried out in the early morning. Part is eaten with "ginger tea" (ii) and part is carried to the fields. There is very little variation in meals. In rural (iii) is made into bakes, if goat meat is used or fish etc., they may be eaten at any meal. Bread is replacing roti (iv) to a slight extent. Cooking oil (usually coconut oil) is used extensively but boiling and baking is also common. Ghee is very popular but not used extensively because of its price. For consumption of vegetables, see "Nutrition" in PartFive of this report.

Indian food retains a distinct oriental flavour by virtue of the curries, flourings and other spices used in its preparation. Beverages are tea, coffee and ginger-tea. The Indians are responsible for bringing to Trinidad many of the vegetables and fruits which they utilise.

(1) A load of hardwood costs $7.00. Bamboo is obtained from the bamboo plantations originally planted for the now dead paper-pulp industry. This is obtained merely for the cost of transport. The use of this bamboo has begun and since hardwood is scarce, it would seem worthwhile for the Government to buy up at least part of the area and make it a firewood reserve.

(ii) An infusion of Ginger roots.

(iii) See notes on cultivation of pigeon peas and woolly pyrol utilisation.

(iv) An unleavened "pan-cake" with masala and split peas in the middle.
Housing

The customary dwelling of the Indians who constitute the present population in the survey area consists of a usually immaculately clean square or rectangular house usually with a smaller construction constructed of similar material at the back which is used as a cook-house.

A framework of poles, cut from the bush, is erected, and a thatched roof of palm leaves or grass is fastened on with the twisted stems of a fibrous weed (Sida spp.) (v). The straight thin branches are tied horizontally between the uprights at intervals of six inches. This is the framework on which the wet tapia is hung, starting from the bottom and working upwards. "Tapia" consists of a mixture of a puddled non-shrinking clay with tapia grass (Sporobolus indicus). The sub-soil in most of the survey area but particularly that of the "St. Augustine loam" is quite suitable. A Ditch about 6 ft. x 4 ft. 6 ins. to 1 ft. deep is dug and the top soil put to one side. The sub-soil is loosened, tapia grass cut from waste lands placed on the sub-soil and water is admitted. Then the grass is trampled with the feet into the clay.

(i) A load of hardwood costs $7.00. Bamboo is obtained from the bamboo plantations originally planted for the new dead paper-pulp industry. This is obtained merely for the cost of transport. The up-rooting of this bamboo has begun and since hardwood is scarce, it would seem worthwhile for the Government to buy up at least part of the area and make it a firewood reserve.

(ii) An infusion of Ginger roots.

(iii) See notes on cultivation of pigeon peas and woolly-pyrol - utilisation.

(iv) An unleavened "pan-cake" with masala and split peas in the middle.

(v) Main palm is Timite (Manicara sp) but carat (Sabal sp) and Co- corite (Maximiliana) are used. Main thatching grass is needle or Housegrass (Imperata).
The interior walls are also made of tapia and the floor is laid with a similar clay and is built up about six inches above the outside ground level. A drain is usually dug just around the outside of the house. When the tapia dries, small cracks appear and these are impregnated with a suspension of cow manure. Finally, the walls are white-washed with a suspension of almost kaolin brought from another district. A typical house would have a verandah (at ground level) termed the gallery, a room for the parents, a room for the children and an eating room. If the outside cooking house has not been adopted, cooking will be done in this room. The Madras Indians do not usually have the cooking house detached. The idea of detachment is a very good insurance against fire. The house may or may not have a special room for seeds, rice-storage and implements etc. If a son gets married, the father is obliged to provide a temporary room for him by partitioning an already existing room.

The time taken to erect such a house depends on the availability and proximity of raw materials, the skill of the builder and the time which he is able to devote to the job. The house in photograph (3) is the simplest type, was built entirely by the owner and was completed in 10 days. The house in photograph (4), (5) and (6) - the same house in each case - involved certain innovations such as a raised floor, steps and windows. This house was built partly with the help of a carpenter and one or two irregular friends and took seven weeks to complete. (The actual owner only worked part time on the construction of the house).
Other innovations which are commonly seen involve the use of galvanised iron for roofing as opposed to thatch - though thatch itself is quite costly (Tinite palm leaves cost $3.00 per 1,000), use of doors and construction of concrete steps.

The finished house is fairly cheap, water and weather proof/very cool. It is usually overcrowded by the large families. The main disadvantage is that without the innovations just noted, the interior is dark and poorly ventilated thus favouring mosquitoes. The floor also becomes very damp and cold during the wet season and the children get perpetual colds. Some people make a plank floor on or just a few inches above the ground. This is undesirable as it encourages rats.

Modern Tendencies. Changes in progress have already been noted but in their attempts to improve their customary dwellings, the people need guidance and advice; but the most that has been done is that the Health Department have drawn up plans of ideal houses which are quite outside the range of the ordinary peasant. This is a fact which has been recognised by the Peasant Investigation Committee at I. C. T. A. and the type of house which has been constructed is very satisfactory.

The simple unchanged customary dwellings account for about 60% of the Indian houses in the survey area. About 35% are built on the customary basis but with modern tendencies, and 5% are of the simple European design. Occupants of the latter are not usually farmers but business-men. Even in the latter, the cooking is still usually done in a small couthouse.

Death Ceremonies With the Indians, these occasions are not accompanied by heavy expenditure as is the case with the West Indians. The Hindu religion demands a period of mourning but only a simple burial. The body is wrapped up in calico, placed in a rough wooden coffin and buried. Women are not allowed to attend the burial. With the Indians originating in Northern India this mourning is carried cut because of the death of a loved one. With the Madras, it is a time of rejoicing because the loved one has been freed of earthly worries and has found rest.

With births, the Northern Indians rejoice because a new life has been made but the Madras mourn because there is yet another one to face the trials and hardships of life.

Other Characteristics (Personal) An Indian is an extremely unscrupulous and vicious enemy, and if his hate is engendered, will go to any length to make his opposition suffer. For this reason they seem to be always having court cases and these are always followed by rum-drinking which ends in a fight or other violence and so they all go back to court again. an extremely interesting existence! The Indian, although he may not show it, is extremely sensitive to abuse and will nurse a grudge for years as a result of it. At the same time, he is very generous, hospitable and respectful to those who treat them with respect and patience.

A most important characteristic is the desire for ostentation. The fact that expenditure on weddings is perhaps decreasing does not mean that their ostentatiousness is declining - the form is only changing and the possession of smart clothes, wrist-watches, jewellery and cars or trucks, if possible, are much more important than feeding the children. One wonders whether in fact, crystallisation of the Indians is not making them more ostentatious than ever; but perhaps it is an innate characteristic which is gradually finding enlarged opportunity for gratification. If only an extension worker could build up respect for an excellent type of stock pen or small rotary-hoe, this characteristic could be turned to good account.
The Indians are not sometimes referred to as the "Jews of the East" for nothing. When first the indentured labourers arrived it was found that nothing would entice them to convert money into food on anything but a miserly scale and the employers were forced to pay them in rations to some extent. At the present time, the Indians will not eat any of their produce for which there is a good market. The exception to this is rice. Eggs and milk are usually sold and not consumed. Vegetables will not be eaten unless the market price falls. They are thrifty for six days in a week and possibly also on the seventh. But when their blood has been warmed with just a little rum, all thrift goes out of their system. Apparently the two are incompatible. Thus the job of the extension officer will not be easy. If the people are what concerns the extension officer (and of course they must be the main concern) the solution of many problems will not be a matter of finding ways of putting more money in their hands. We must put more and better food in their stomachs and better clothes on their backs and so on.

A great difficulty to be overcome is the traditional persecution complex of the Indians as a whole. In India, the great bulk derived this characteristic from the caste system. The children grew up in a servile atmosphere and their whole outlook on life was coloured by this background. Their outlet was to blame the rich for their troubles. Again, the Indians in India did not love the British who are their masters in Trinidad and one will go so far as to say that an abstract Englishman is hated on principle. It is a different matter if they learn to respect one with whom they deal. Nevertheless, an initial handicap must be overcome. If it is overcome, the Indians will regard their white friend as a saviour. These are so few that one would like to join in with the Indians and sing "It's the same the whole world over".

One final characteristic of the Indians which must be mentioned because it is perhaps the most important is their intelligent industriousness. And to find out more about this, read Part Four and in particular, Section Three.
PART 11

THE AMENITIES AND SERVICES AVAILABLE TO THE POPULATION

Summary:

1. Agricultural Extension Services.
4. Domestic Water Supplies.
5. Roads and Traces.
8. Health Services.
A description of the Extension Branch of the Department of Agriculture is appended to this report. From this statement it will be clear that the surveys area comes within a district for which a Field Assistant (i) is responsible and his immediate superior, the Agricultural Assistant (ii) should also be concerned with the survey area in a general way since it comes within his county.

The duties of these two people are also described in Appendix E.

Those of the Field Assistant are the most important so far as the area subject to this survey is concerned. A crop survey has been carried out and this consisted only of assessing the area under various crops. It was not concerned with the method of cultivation of the crop, yields, varieties or any other detail concerning its culture; and it is a remarkable fact that the survey was carried out without becoming known that the name of the man doing it was Ghany and only a very few found out that he was from the Department of Agriculture. In fact, a great number of smallholders do not even know that a crop survey was carried out. This is not meant, in any way, to be destructive criticism of persons involved but adds weight to the argument that the "Extension Services" of the Department of Agriculture will only be an idealistic abstract notion, until an efficient junior staff is obtained. This makes the "Centeno Training Centre" fiasco look like the tragedy that it really is. (See Appendix E).

Up to the present therefore, the extension branch of the Department of Agriculture has not had the slightest impact on the Survey Area, in spite of the fact that a very promising, if small, irrigation scheme is working in it. Any extension is done by an irrigation engineer from the Department of Hydraulics.

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(i) Mr. M. V. Ghany (District No.11 b, St. Joseph) - Postal address: St. Joseph.

(ii) Mr. D. M. Farrell (County St. George) - Postal address: Eastern Main Road, Petit Bourg, San Juan.
2. EDUCATION FACILITIES

The most important aspect of education facilities is the provision and adequacy of primary schools (240 in Trinidad). All secondary education is centralised and out of reach of the population covered in the present survey. Distribution of primary schools in the district is as follows:

- Tunapuna - Two (one Canadian Mission and one Roman Catholic)
- Curepe - Two (one Canadian Mission and one Church of England)
- St. Joseph - Two (one Roman Catholic and one Government)
- Tacarigua - One (Government)

Of these schools, the ones at Tunapuna and Curepe serve the great majority of children in the survey area. The Canadian Presbyterian Mission has consistently interested itself in the Indian population (1) and the latter have responded to this interest and prefer the C.M. Schools to all others. Though a few negro children attend C.M. schools, the dominance of the Indians in them means that they (the Negroes) prefer the other schools run by the Government, Roman Catholic Church and the Church of England.

Primary school education is compulsory between the ages of six and twelve although, if desired, is provided free of charge between the ages of five and fifteen years. In spite of the nominal compulsion, the school attendance of the children in the survey area (mainly Indian) would appear to be very irregular. There are three reasons contributing to this:

1. In one or two families, sufficient clothing to enable attendance could not be afforded.
2. The distance of gardens from the home means that the school children often remain at home to look after the infants when their mother is required in the garden.
3. Illness among members of the household is common and the children, if not affected directly often have to assume responsibilities which keep them away from school.

Compulsion could never be enforced under the existing "dual-system" of education. In this system, the Government shares the responsibility of education with the various branches of the Church. Mahomedans and Hindus sometimes (and justifiably) dislike sending their children to Christian schools where secular education is accompanied by instruction in the Christian religion; and indeed, Englishmen would object if they were compelled to send their children to, say, a Buddhist school. However impartial the teachers might profess to be, one would still feel that the children would receive a Bhuddistic approach to life in general. This idea is supported by the fact that non-Christians are never made head-teachers by denominational boards. In any case, the schools are overcrowded and the idea of compulsory education will only be a joke while this condition remains.

A recent ordinance makes it possible for non-Christian bodies to set up their own schools. The Hindus have already taken advantage of this to give classes in Hindustanee etc. As mentioned in Part One, one of these "schools" operates in the lower St. Augustine area, and another in Tunapuna. Still others are found scattered about the country. It will be extremely interesting to follow the progress of these small beginnings, for if they get sufficient financial backing for development up to the standard of other schools, it is certain that the Indians will sponsor no others.

The social consequences of the policy showing through the above discussion would not appear to be very comforting. The incompatibility of Indians and Negroes is certainly not being improved.

CURRICULUM.

For the most part, the children receive instruction in the three R's, geography and nature study. The latter subject together with work in the school garden constitutes the sum-total of education with a direct bearing on agriculture except that the "4-H Club" Movement is fostered as an extra-curricular activity.

(1) See Appendix 1. Tables 6 and 9. The Indians are far behind the Negroes in literacy.
These are organised on a competitive basis between schools, the stated aims being:

(1) To beautify the school and train pupils in neatness.
(2) To teach the pupils to recognise, grow and perhaps eat new plants.
(3) To improve observational powers, teach best conditions for plant growth and to demonstrate the simple lessons of nature.
(4) To understand the disappointments consequent upon praelidential larceny.

The C.M. School at Curepe might be described as an example though it is hardly typical inasmuch as its garden has consistently run in either first or second place in the competition. This school has about 560 pupils mostly Indian. For each of five days per week, they receive 4½ hours secular education and one hour's religious education though the latter is not compulsory. The school garden is 50 ft by 110 ft, i.e. less than one-eighth of an acre. In this garden, the senior pupils (13 years +) spend 1½ hours per week, the junior pupils (8 + to 13 years) spend one hour per week and the infants spend no time at all. What goes on in the school garden depends entirely on the attitude and knowledge of the head-teacher (i). At the C.M. School in Curepe, apart from vegetable growing, the growing of grasses and grains for stock feed, the budding of citrus, the management of a beehive, the rearing of rabbits, the rearing of chickens and the design and maintenance of ornamental gardens and lawns is attempted. In the vegetable garden the head-teacher uses a rotation which he thinks fits (and in many cases there is none at all) carries on varietal and manorial trials, makes compost and tries various crops. He keeps records for purposes of subsequent inspection of gardens and the senior pupils are given general notes on various aspects of agriculture. As an encouragement, the pupils are given the produce to take home (ii). Apparently the idea is not to actually teach any detailed agriculture but to create a background of impressions which could be built upon later (iii). For the age groups involved, nothing more ambitious than gardens could be attempted. In rare cases like the Curepe School where the head teacher is enthusiastic and enlightened to some extent, the gardening effort probably does have a useful influence on the pupils, but on the whole it is true that the gardens leave very much to be desired. In fact, a considerable body of opinion (mainly negro) thinks that the school gardens should be abandoned because they are a form of activity which is degrading; but however unsatisfactory, the school gardens are from an extension worker's point of view, they represent a plant which should not be up-rooted until a better plant can be grown. Weaknesses of the system are:

(1) That the management of the gardens is in unskilled hands.
(2) This has often meant confusion between gardening efficiency and the beautification idea.
(3) The competitive aspect between schools is probably overdone and although the judges presume to make arbitrary allowances, the variation in soil from school to school etc. makes the system rather unjust. It was the opinion of the head-teacher (iv) of Curepe C.M. School that there would be little enthusiasm without the competitive spirit. This might be true for the better schools but those coming at the bottom can hardly be expected to be enthusiastic about it. More often than not, the state of the garden is simply an indication of the knowledge and enthusiasm of the head teacher rather than the knowledge and enthusiasm of the pupils.
(4) The arrangements for equipping the gardens are unsatisfactory. In many cases, the head teacher is forced to buy equipment from his private means in order to carry out the dusting of plants to control insect pests and to be able to rob the hive or bees which one teacher had got going. At present, the head teacher must requisition for equipment and

(i) In most cases this is true although since writing it, one has learnt that the Education has placed the management of the school gardens under an extension worker from the Department of Agriculture who is usually a field assistant theoretically (see section on Agricultural Extension Services). In many cases however, one of the school teachers or the headmaster knows more about gardening than the Field Assistant from the Agric Dept. and the latter keeps well away from school gardens. Where a garden is very poor, the idea is that a more senior extension officer will take charge until it is in a state where the field assistants can take over. This policy however is held up by lack of trained staff.
(ii) This is in theory only. In too many cases, the produce goes to the friends and relations of the headmaster. The children there-
fore get rewards for their labours and a big psychological error is thereby made. The headmasters justify their actions by drawing attention to the fact that they have purchased the seed etc. out of their own pockets and the children often adjust things by theft from the garden.

(iii) Mr. A. Kalloch (iv) The Dept. Agric. is planning to establish "Young Farmers Assoc." to catch the children as they leave school.

(4) if sanctioned by the Department of Education, an order is placed with contractors to that Department. Sometimes they are unable to supply the equipment and the requisition lapses and in other cases long delays are incurred. There is no special allowance for the equipping of school gardens.

Suggestions for improving the effectiveness of school gardens as instruments of agricultural extension are summarised below:

(a) It seems a pity that school gardens are proceeding so haphazardly because the agricultural department is unable to supply expert knowledge through their existing extension set-up. School gardens are of sufficient importance to warrant the setting up of, say, a School Gardens Officer with a staff of 12 Post Graduate Students from the Imperial College of Tropical Agriculture who could be given the work as part of their course. One cannot stop to enumerate the advantages of such a scheme. The fact that such students are unskilled in tropical agriculture could be overcome if the right ones are selected and if the School Gardens Officer knew his job.

At present, the Agricultural Department assists in judging of gardens and latterly, in advising on the site of schools and gardens.

(b) The Aims should be extended to include the female pupils, e.g. methods of utilisation of various crops would carry the effects of school gardens one stage further and would ensure that the pupils were rewarded for their efforts.

(c) The area of the school garden should be extended to make possible the use of small scale farm machinery such as a small rotary-hoe.

(d) These suggestions mean that more time must be spent in the gardens. One to One and a half hours per week is ridiculously short.

(e) The Education Department should set up more efficient machinery for handling the equipment requirements of the school gardens.

(f) Irrigation water should be made available by some means or other especially during the dry season.

The 4-H Club Movement

Both the Education and Social Welfare departments are concerned with the "4-H Club" movement in Trinidad. The movement is very successful in U.S.A., but the attempt at transplanting the organisation into Trinidad has not been very satisfactory. Because the children are different racially and have a different outlook on all relevant activities, because the natural conditions are so different, because the attitude of the parents is so different, because there is no adequate staff to supervise the movement and because of many other reasons, it is not surprising that a scheme which worked in U.S.A. has not "caught-on" in Trinidad.

Such as it is, the movement embraces children of primary school age mainly. In fact it is supposed to function through the primary schools as an extra-curricular activity. A pupil joining the club takes the pledge which gives the organisation its name:

Pledge my Head to better thinking
" Hands to better service
" Health to better living
" Heart to better loyalty to Club, Community and Country.

Each pupil is given a choice of "projects" e.g. a garden project. The requirements of each project is formulated by the supervisor for each district who is usually a headmaster appointed for this extra job by the Education Department. In the district including the present survey area, the prescribed requirements for the garden project are:

(a) that an area of 10 ft by 10 ft should be cultivated.
(b) any crops may be grown.
(c) a record book should be kept.

The Supervisor has an assistant who is a school-teacher and each school has a school teacher to lead each project. These are run on a competitive basis and judging is done by a Committee consisti-
ing of the Supervisor and his assistant and the project leaders. The best members are then suitably rewarded.

At the C.M. School, Curepe, there are 30 members out of a total attendance of 560 pupils. They are concerned with the live stock project, gardening project and the needlework project (girls). Of about 32 schools in the district, 12-15 have 4-H Clubs.

Evenings meetings are supposed to be held regularly but teachers who have worked all day cannot be expected to be very enthusiastic about these. Again it is up to the teachers to maintain the interest of members who leave school. The position of 4-H clubs is very unsatisfactory.

The Junior Red Cross Movement

Again this is operated by school teachers through the Primary Schools. A good deal more enthusiasm is shown by school teachers in this organisation than with 4-H clubs. The "extension workers" of the Health Department assist greatly with demonstrations and lecture s at evening classes and meetings.

The results of these Voluntary Junior Movements could not be expected to affect the Survey Area except over a period of years equivalent to a generation; but they are so ragged and thin in the numbers of children affected up to the present that one can expect practically nothing from them.

3. SAVINGS AND CREDIT FACILITIES

The services of the Post Office Savings Bank are available through the Tunapuna Post Office but only relatively few of the people make use of this institution. Most of them hide their money somewhere in their homes and regard the formalities associated with banking with suspicion. There are however other movements which encourage saving and thrift. The Friendly Society movement in Trinidad is gaining rapidly in importance but as yet, its adherents are mainly West and not East Indians. For the latter, the practice spoken of as Su-Su is much more common and does operate in the St. Augustine- St. Vincent and St. Anne- St. Vincent Lodge area.

Su-Su

A group pf 15 to 25 people elect a leader who becomes Secretary, Treasurer and Messenger boy. Each person agrees to pay into a fund either fortnightly or monthly, a unit amount of multiple of it. The unit amount may be $5.00 up to $10.00 (often $5.00) per fortnight or month, and having been agreed upon, nothing less than the unit amount can be accepted; but multiples of the unit amount can be paid in e.g. if the unit amount is $5.00 per fortnight, then $10.00 or $15.00 may be paid if the member can afford it. But if a man starts off paying in one unit, he cannot change the amount of his payment during that Su-Su. Similarly, a man who originally committed himself to a fortnightly payment of three units must continue until that Su-Su is completed. Suppose twenty people are paying in $5.00/Fortnight, that $100.00 is available every fortnight and the members take it in turn to draw this amount. The drawing of $100.00 is termed a "Hand". The order of drawing hands is fixed by drawing lots, with the understanding that if any member suddenly finds himself in difficulty he has the right to draw a hand out of turn. Thus, every member will draw a hand once a year and in the next year, a second round might be started. It is at this juncture that the number of unit amounts paid may be changed. If a man pays in two units he is entitled to two hands and so on.

It will be seen that at the beginning of a round a man will receive $100.00 after having paid in only $5.00 i.e. he is credited with $95.00 interest free (except for the small amount which each individual pays to the Secretary for his trouble). Any person in need of it has a right to credit in this way, although if he is near the last to draw a hand his advance will be very small. At the same time, his savings in the Su-Su mean that he will require less credit. For the first ones to draw a hand there would appear to be a great temptation to default in subsequent payment but in fact this seldom happens because great personal risk would be attached to such behaviour and only people of integrity and financial stability are admitted into the Su-Su.

For the people involved, the Su-Su is probably a very good thing because it forces saving and provides credit in cases when it is necessary. Once having to contribute, no one can withdraw from the fortnightly or monthly payments or any money contributed already is forfeited. In this respect, the Su-Su is very different to the
Savings Bank where saving is purely voluntary. A disadvantage of the Su-Su is that the money does not bear interest - in fact it depreciates slightly because the Secretary is given a small amount for performing his duties.

Other Sources of Credit

The Agricultural Bank - had its starting point in the Hurricane Relief Fund provided in the early 1930's for damaged Cocoa and Coconuts estates. It began to provide loans for current working of the estates on the basis of a mortgage. Later it took on the executive work in connection with the cocoa subsidy scheme when the industry began to decline seriously due to disease (i). This body was in recent years turned into an agricultural bank and provides credit for any agricultural enterprise whether it be for current working or capital improvements etc. At the same time, business houses which had previously made advances for the latter, withdrew from that field of activity. The Agricultural Bank provides credit for both estates and smallholders but in both cases it is based on property mortgage. Because many peasants felt that the mortgage was only a joke and not really meant, and perhaps because they did not understand it, foreclosure resulted. Peasants were subsequently more careful about going to the agricultural bank for credit.

Method of Working. The Bank does not give credit to one small-holder as such but encourages the formation of Agricultural Credit Societies consisting of twelve to fifty people. Their combined land forms the security for a loan which is given to the Society @ 3% interest. The Society divides this loan between the members and charges 7% interest to individuals in the Society. Repayment is through the Society and not directly between the individuals and the Agricultural Bank. Of the 7% interest charged by the Credit Society, 3% reverts to the Bank as interest on the principal loan, 1% goes towards the expenses of the Society (it has often been very much more) and 3% accumulates in a reserve fund. As this reserve fund swells, the Societies require correspondingly smaller loans from the Bank and the idea is that ultimately, the Credit Societies will become quite independent of the Bank.

One difficulty has been that the Societies could not or would not keep their own books. Now, the Department of Agriculture provides inspectors to teach the Societies how to manage their own affairs and the cost of this service is borne by the agricultural department. Another difficulty is the very slow rate at which the reserve fund increases but taken all round, the Societies are said to be very successful. If one individual defaults, the Agricultural Bank levies on the Society as a whole and so only credit worthy individuals will group themselves together into a Credit Society.

There are 143 Societies functioning in Trinidad and Tobago at the present time. 117 of these are run directly under the Agricultural Credit Bank and 26 are run by the sugar estate - Usine Ste. Madeleine. Distribution of the societies is as follows:

Agricultural Credit Societies 1947

<table>
<thead>
<tr>
<th>Location</th>
<th>Agri. Credit Bank</th>
<th>Usine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinidad - County St. George</td>
<td>6</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>St. Andrew</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Caroni</td>
<td>28</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td>Nariva-Hayaro</td>
<td>12</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Victoria</td>
<td>41</td>
<td>26</td>
<td>66</td>
</tr>
<tr>
<td>St. Patrick</td>
<td>9</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Tobago</td>
<td>18</td>
<td>-</td>
<td>18</td>
</tr>
<tr>
<td><strong>T O T A L</strong></td>
<td><strong>117</strong></td>
<td><strong>26</strong></td>
<td><strong>143</strong></td>
</tr>
</tbody>
</table>

Other statistics relating to the Agricultural Credit Societies are given in Appendix (G).

The system saves an endless amount of book-keeping at the agricultural Bank, encourages a community approach to the solution of problems and gives the people a feeling of responsibility in managing their own financial matters. Both West and East Indians are involved and it is a credit to the management of the Societies that the distrust with which an East Indian commonly regards his neighbour has -

(i) Witches Broom Disease - Marasmius perniciosus.
been overcome. There is no society in the survey area, but there is one in Tacarigua and several in the Piarco area. At present the high prices offered for cane and food crops have reduced the need for credit considerably but when the proposed extension programme for the area gets going (this is probably the height of optimism and conceit) there would be a need for credit. Thus the Credit Societies are of great potential importance in the survey area.

Many people have little or no security to offer to a bank when borrowing and are forced to deal with a local moneylender; and many who can offer a security, for various reasons still prefer to deal with a private individual rather than a bank. There is one moneylender actually living in the survey area (i) and at least one other available in Tunapuna (ii). The lender living in the survey area states that most of his clients (i) are West Indians who borrow mainly for purchase of cars and building of houses; that Indians (East) do not borrow nearly as much and that much difficulty is encountered in obtaining repayment of both interest and capital; that old generation Hindus do not borrow at all for social expenditure on weddings and feasts etc. This is contrary to their religion which holds that if such events are financed by borrowed money, all the credit is due to the lender and none to the borrower. Younger generation Hindus are inclined to ignore this but it is stated that borrowing for weddings etc., is still uncommon. When it does take place, it is usually for about $50.00 or rarely for more than $100.00.

Loans are made at 25% interest, on a promissory note without a security for amounts up to $100.00 and up to $250.00 if the lender trusts his borrower. For people unacquainted with the lender, and for all loans for more than $100.00, a security is usually demanded and the interest rate is 10% per annum.

4. DOMESTIC WATER SUPPLIES

Control of domestic water supplies, rates and charges are described on next page. Of the different charges for different forms of water supply only the stand-pipe charges (and usually at the minimum level of 96%) are of any importance.

The system is quite a good one for Trinidad could not possibly afford anything more elaborate. Nevertheless there are criticisms to be offered. Firstly, more taps are required and secondly, a better pressure is required in the taps. Obviously the first cannot be attempted unless the second is rectified. In the lower St. Augustine area there are taps which only dribble at certain times of the day and the activities of certain members of the family are conditioned by the pressure of water in the pipes throughout the day. Again, in the Streatham Lodge area, the people in many cases are not within half a mile of a stand-pipe but have been charged the usual water rate. These people depend on wells.

It is a pity that the Gouria Dam scheme has fallen through because it would have remedied the poor pressure noticeable at certain times of the day, and amongst other things would have made the erection of more stand-pipes possible.

The body controlling the distribution of water in rural areas is the Central Water Distributing Authority (Ordinance No.6 of 1944). This superseded the Central Water Committee. The Department of Hydraulics (constituted under the Waterworks and Water Supply Ordinance No.5 1944) is responsible for impounding, winning, pumping and purification of water. Municipalities such as Port of Spain, San Fernando and Arima handle their own water distribution. Both in municipalities and rural areas some people arrange their water supply privately e.g. wells and tanks.

The extension of water services (domestic) in rural areas is based on the "stand-pipe system" whereby taps are placed at strategic points. It is claimed that this method is most economical of water. However, water may be laid on to houses if the occupants can afford it.

Foot note Page 22.

(i) Mr. Charles Bhagwan-Singh - Streatham Lodge Road. (Christianized Hindu)
(ii) Mr. J. Barat - Eastern Main Road, Tunapuna.

Foot note Page 23.

(1) Most of his clients are people who live in the district and when the lender knows personally.

Foot note Page 22.

(1) The lender actually produced promissory notes totalling over $2,000.00 for which repayment was long overdue.
Stand-Pipe Service - paid for by a General Water Rate which is usually 7½% of the annual rateable value of the house (if the value of the latter is greater than $24.00) but the figure is 7½% for the D'Abadie-Tacarigua area. If less than $24.00 a flat minimum rate of 25c per room ("room" usually includes the whole of a typical Indian dwelling) is charged.

The above charges refer to any house within a quarter of a mile of a stand-pipe. Outside this area, the General Water Rate does not apply.

Metered Service to House - If the house is within a quarter of a mile from a stand-pipe, the occupant pays the General Water Rate. Apart from this charge, a free allowance of 24,000 gallons is given above which water is charged for at the rate of 40c per 1,000 gallons.

If the house is not within a quarter of a mile of a stand-pipe, the General Water is not charged but the above free allowance of 24,000 gals. a charge of 60c per gallon, is levied.

Non-metered Water Service to House - People with an unmetered water supply to the house pay the General Water Rate (7½% of the annual rateable value of the premises) plus the Water Service Rate - 2½% of the annual rateable value of the premises except in the Tacarigua area and the D'Abadie area where it is 3%. This rate permits taps on the following basis:

Annual rateable value of premises less than $25.00 ----- One Tap

" " " " more than $25.00 but $240.00 ---- Two Taps.

" " " more than $240.00 ----- Three Taps

A fee of 60c per annum is charged for any taps additional to those except garden taps for which the fee is usually $4.80 per annum but is $14.40 in the Tacarigua area for one garden tap and $28.80 for each additional one.

Charge for a W. C. is $4.80 per annum and for a shower is 60c per annum.

Both cost 10c = 18c per annum per gallon capacity.

5. ROADS AND TRACES

The type of road in the survey area vary from very good "pitched" roads to gravel and grass surfaced roads. In the latter case, the state of the road depends largely on whether or not it is properly drained. The maintenance of roads and drains is a very important matter for the local population because the land may become almost completely inaccessible during the wet season if maintenance work is not carried on. The problem is worse on roads running into private property where the obligations of the landlord, and the relation of the landlord's roads to the several Government bodies with jurisdiction over roads is very confused.

That there is obviously a lot wrong with road maintenance administration can be seen from the following photographs.

P(13)
A donkey is practically useless on "roads" like these.

A boat would be of far more use than an ox-cart along this stretch of water.

The two snaps above were taken at the beginning of the wet season. The one at left was taken in early January i.e. in the early part of the Dry Season.

This condition of the roads in Streatham Lodge has a big effect on the activities of the people. Cane is not manured on a gratifying scale because the growers cannot get their manure in to their fields. Grass which would normally be cut and fed to livestock is just left because it cannot be cut or carted out. The cane in this area must be cut before the roads become impassable in the wet season and on the whole, the cultivators and their wives are discouraged from going into their gardens.

This is the position as it is on roads running through the privately owned Streatham Lodge Estate. It is nothing like so bad on other roads and traces although confusion arises sometimes on Government roads when it is not certain whose responsibility they are. The peasants do not know to whom they should complain. The actual set-up for road administration is:

Department of Public Works - responsible for main roads, link roads and certain others as well as the drains along them. Cleaning of these roads is the responsibility of the Health Department.

The Local Board - This is a mock attempt at partial local government in that it is a body elected by the income-tax payers of the community. The board elects its own chairman and maintains certain roads, allotted by the
Public Works Department with Government funds. The latter is not sufficient to make it possible for the local board to carry out much in the way of improvement programmes e.g. Pitching -

"Pitching" of certain roads is carried out by the local board. The Pitch comes from the famous "pitch-lake".

In some cases no one knows whether a road is the responsibility of the Local Board or the P.W.D. Often the P.W.D. will look after a road until it is in good shape and then hand it over to the Local Board for maintenance.

The Local Health Authority - This body consists of the county Warden (Chairman), Senior Medical Officer of Health of the County (Secretary), two or three members of the Local Board, a district Engineer, other M.O.H.'s of the County, the Assistant Warden and perhaps others appointed by the Government.

The Local Health Authority becomes responsible for the cleaning and draining of roads which are considered to be jeopardizing public health. In many cases the L.H.A. will take over a road until the drain has been connected after which it is passed over to the Local Board. The L.H.A. is also concerned with drains other than those beside roads.

The Warden - is responsible for "crown traces" which are tracks off roads leading into private property which serve a small village or community. The actual definition of a crown trace does not appear to be clear.

Private Land-Owners - are responsible for roads in their land although the Local Health Authority possesses the right of entry to clean drains, etc. The Government possesses the right to actually take over and manage private roads.

If the reader is now quite confused about road control, it simply means that the writer has represented the position with more than usual accuracy.

The Roads of the Survey Area:

The roads maintained by the Managing Agencies apart from private owners are satisfactory except perhaps for certain crown traces in the lower St. Augustine area and around the irrigation area.

The roads which should be maintained by the owners of Streatham Lodge are in fact not maintained at all, as examples in the previous photographs show. The manager claims that the rents are not high enough to permit proper road treatment - this in spite of the fact that the rents appear to be very high e.g. $10.00 (£211.6 stgs.) per acre for rice land. He claims also that the enforcing of the Rent Restriction Ordinance has put the cap on the present rent situation. It is certain that the present rents are insufficient to put the roads in order but should be sufficient to maintain the roads once put in order.

The present position is that the tenants want the roads put in order, by whom, they do not care. Streatham Lodge is not worried because land is so short that they get their rents regardless of the state of the roads. The Local Health Authority is interested because the whole position of Streatham Lodge is a menace to public health. The Government is prepared to declare the roads crown traces, if the Estate first puts then in order, but are unwilling to take them over in their present state. And so the matter rests.

Incidentally, Streatham Lodge Estate is preparing to make a further block of 40 acres available for house lots in the Upper Streatham Lodge area. For this, they must conform to certain regulations as regards roads and drains; but the Local Health Authority maintains that Streatham Lodge cannot be treated piecemeal and is so far holding up permission in the hope that it will force the Estate to repair the whole area.
The survey area is served by a market which is typical of many similar ones throughout Trinidad. The one in question is situated at Tunapuna and consists of a large well ventilated structure in which fish, meat, etc., as well as perishable agricultural products are bought and sold. Vendors, usually wholesale dealers, are able to hire a "table" for 36c per month or 6c per day, or a "stand" for $1.08 per month or 18c per day. The producers usually sell their goods to a wholesale dealer who retails from his stand or table. Sometimes the producer retails his own goods.

The market operates between 6a.m. and 4 p.m. on weekdays, 6 a.m. to 9 a.m. on Sundays and is closed on public holidays.

The building usually cannot accommodate all the dealers and many set out their produce outside the market building. This is illegal if the fee of 6c per day is paid, but some shift their produce to a position just outside the precincts of the market and retail without paying the fee. This practice is illegal. Maximum wholesale prices are fixed by government and maximum retail prices are fixed at a higher price to allow an adequate profit for the retailer. In many cases the fixed or schedule price, both wholesale and retail, is considered the minimum price to be accepted when selling. In many cases however, the grower is forced to sell at prices for below those fixed by the Schedule. This price-fixing has led to a considerable amount of black marketing in spite of the penalty imposed for such an offence. Retailing outside the market building is favoured by black marketers because the supervision of the marketing officer is less strict.

The market is run by the Warden's Office which employs an officer to man-ager the market. This man keeps no records of prices but each week an officer of the Marketing Division of the Department of Agriculture visits the market and takes down the retail and wholesale prices of Agricultural produce available and makes observations on the relative scarcity or abundance of the more important food crops. Such figures for the Tunapuna market are given in Appendix H. These figures give some idea of price fluctuations and the seasonal distribution of the food crops. The distribution observed in these figures refers not only to the survey area - the availability of various foods is spread over a longer period because the market serves the hillside gardeners north of Tunapuna as well as the lowland gardeners of the survey area.

N.B. (1) Another method of marketing agricultural produce which is sometimes used, is for the grower to sell his crop while it is still in the ground. The method is only used for root crops and is a gamble on the part of both buyer and seller. The method is a way of getting around the schedule prices without breaking the law.

(13) It should be mentioned in passing that Indians on the whole have acute business instincts and produce will often pass through several middle-men before it reaches the consumer. As an example of this characteristic of making a good thing out of nothing as a "go-between" from producer to consumer, an example from the survey area of a U.S. Naval Base employee may be cited:

This man travels to and from the Base on a bicycle passing by cross gardens beside the Churchill-Roosevelt Highway. On Friday and Saturday afternoons he buys his crop at the wholesale price on the way home from work. On Sunday morning a special trip is made and the accumulated amount of crop is sold on Sunday morning at a higher price to a retailer at Tunapuna market.

7. ENTERTAINMENT AND JURIDICAL FACILITIES

The latter are on the traditional British pattern. The law-courts and entertainment are inseparably bound. It has already been noted that the Indians, as a race, have a vindictive streak in them - hence their litigious tendencies. An opportunity to bring an enemy to justice is never missed no matter how trivial the offence might be. Large sums pass into the hands of the lawyers -large quantities of rum are consumed on the day of the "case" and for the men, the day's fun is terminated by soundly thrashing their respective wives.

Cinemas showing English, American and Indian pictures are very popular. Social events such as births and marriages are the main occasions for feasting and traditionalcarry-making, though on a smaller scale, such gatherings require but little provocation if the money and food are available. "Poker" is commonly played for small stakes. Sometimes at night, after a certain amount of
rum drinking, the middle of the Churchill-Roosevelt Highway is used as a card-table.

Another great source of amusement to all Indians is the Moslem festival which commemorates the devotion of their religion of two Mahomedan martyrs. The story goes that two brothers, Hassan and Hosein defended their country and religion etc., against a horde of infidels. They inflicted heavy losses on the enemy and continued to fight long after their heads had been cut off. Eventually, they were forced back and fell into a wall or cave. A spider quickly spun a web across the top of the wall and the bodies would probably have rested in peace but for an evil lizard which indicated to the pursuers where the bodies lay (i). Eventually, however, the bodies fell into the hands of friends who gave the two martyrs a dignified but simple burial. As time went on the commemoration of this event became more extravagant in nature and now, most ornate tombs in the form of small temples are constructed. These are called "hossins" (pronounced Hoos). At the traditional hour, the tombs are dragged on wheels in column down the street each one being preceded by two men doing a "stick dance" which symbolizes the fight in which Hassan and Hosein were involved. As an added accompaniment, a band of drummers follows behind the dancing men. "Burial" takes place when the tombs reach the river (in this case, the Tocarigua River). They are then set afloat and tipped into the river. This was once a solemn Moslem ritual which was marked by an atmosphere of prayerfulness, hailing of the sick etc., but now the Hindus also join in. The occasion is marked by an unusually heavy consumption of rum. A group of Indian business-men usually give a prize to the most artistic tomb and the ceremony is rather insincere and phony. At the same time it is an important social event.

The only other entertainment apart from in their own homes, consists of fishing expeditions to the Caroni River and the Caroni Swamp. Having experienced it, one feels that between mud-mosquitoes and sandflies, and about a four-mile walk way, that these fishing trips is a form of self punishment.

Unlike the West Indians, East Indians in Trinidad usually operate their own clubs for social entertainment; but the St. Augustine-Streatham Lodge area lacks this amenity. In the past a club has operated but died a natural death. Thought might be given to its resurrection but until the community learns to feel as a community, there is little hope for success.

8. HEALTH SERVICES

See PART FIVE : NUTRITION AND HEALTH

9. TRANSPORT FACILITIES

For personal transport, the people have available the Government Railway which operates from Port of Spain to Sangre Grande to the east, and to San Fernando in the South. Both lines are within easy reach of the population in the St. Augustine-Streatham Lodge area. Cheap bus services and relatively cheap taxi services are also available (ii). Many of the people, and especially those working outside the area have bicycles.

For transportation of produce to market and for carrying work on their holdings, privately owned carts drawn by oxen or donkeys and occasionally by mules or horses, are used. If the grower markets his produce in Port of Spain, it may be taken by a carrier owning a motor-truck. Horse, mule or donkey carts are commonly used, but oxen are not allowed on the roads in the Port of Spain area.

Right: A cartload of bamboo being brought home for fuel.

(i) To this day, Mahomedans despise lizards, the above story being the origin of this idiosyncrasy.

(ii) Tunapuna to Port of Spain is 12¢ by bus and 24¢ by roving taxi.
PART III

SOIL - CLIMATE - VEGETATION

SUMMARY

SECTION 1
Soils of the St. Augustine - Streatham-Lodge Area

Soil Formations -
Classification of Soils within the Formations -
Description of Soil Types - (St. Augustine loam,
Streatham Sand, Macoyn Sand, River Estate sand and loam, Golden Grove Sandy loam, Pasea Clay, Cunupia Clay).

Soil Analysis -
Variability of Soils in the area.

SECTION 2
Climate in the St. Augustine - Streatham Lodge Area

Rainfall - Average Annual, Average Monthly and Rainfall Intensity -
Diurnal distribution of Rainfall -

Temperature - Mean Monthly Maxima and Minima (Atmospheric) -
Soil Temperature records.

Humidity and Wind Velocity - Daily and Monthly fluctuations.

SECTION 3
Vegetation in St. Augustine - Streatham Lodge Area

Original vegetation -
Useful and Ornamental trees and palms -
Useful and Ornamental shrubs -
Annual Food and Crop plants -
Weeds and Grasses.
There are two soil formations:

(1) Soil derived from the Detrital Material from the Northern Range

These soils have been described by Professor F. Hardy -
"Parent Rock: Colluvial material, i.e., detritus from metamorphic rocks of Northern Range foothills, distant 1/4 to 1 mile due north of the area. Loose quartz and micaeous schist gravel with quartzose sand and silt; little true clay; some free hydrous ferric oxide which colours the material red, orange or yellow. The detritus was somewhat weathered before transportation and deposition. Angle of slope about 1 in 50 to the south. Deposits very irregular; gravel sheets and lenses showing variable thickness and erratic distribution in depth and breadth.

Water-Table 20-30 feet below ground level throughout greater part of the year. Material mostly very porous. The detritus passes under the more recent finer-textured marine alluvial deposits comprising the Caroni Plain lying to the south of the area."

(2) Soils of Young Alluvial Flats

These soils were derived ultimately from the same sort of parent material as the first group with the important difference that water-sorting has taken place. The first group lies for the most part, north of the Churchill-Roosevelt Highway or just south of it. Further South, the soils are alluvial and it would be expected that the sandy sediments would be deposited first and that the soils would become progressively more clayey, the further one went south. This is roughly true i.e., from North to South:

- River Estate sand ............... 74.0%
- Golden Grove Sandy loam ........ 36.5%
- Passae Clay and Cunupia Clay ... 13.5%
- Monplaisir Heavy Clay ...........
- Very little sand

SOUTH

The distribution of river estate sand and its variability suggest riverine rather than marine deposition. The other soils noted are very much more uniform.

Water-Table In this group of soils, the water-table is on the whole very much higher and some areas are completely water-logged during the wet season. This point is important in relation to potential water supply for localised irrigation from windmills as in Barbados.

Both soil formations involve certain recognisable soil types which have been classified as follows:

Classification of Soils in the Survey Area (From unpublished reports by Dr. E.M. Chenery 1945-46).

A. Soils of Old Alluvial or Detrital Flats:

1. Drainage Free - St. Augustine loam (Aozonal Alluvial)
2. Drainage slow - partially impeded Streatham sand and loam (Intrasessional Planosol)

Macoya Sand.

B. Soils of Young Alluvial Flats:

1. Drainage Free - River Estate sand and loam (Zonal Grey-Brown podzolic)
2. Drainage Slow - partially impeded Passae Clay (Zonal yellow podzolic)
3. Drainage very slow - Impeded Monplaisir Heavy Clay.

(1) In a survey of this sort, which is to provide a local basis for extension policy, a sound knowledge of the soil is essential. It is necessary to map the different types of soil, to be able to express the fertility quantitatively so that comparison is facilitated, to correlate existing vegetation with soil type, to be in a position to predict the suitability of a locality to a particular crop and to provide a basis so that the effect of a given policy on soil fertility can be measured over a period of years.

It would be impossible for the extension worker to provide this information and ideally, he should work in close co-operation with a soil survey officer in carrying out this aspect of the survey. The soil chemist will be skilled in the methods of classifying, mapping and analysing the soil but the extension officer will normally be in a better position to observe the productivity of the soil from month to month. Combined, all the necessary information is produced.

This approach could not be adopted during the present survey for obvious reasons; but even if the soil survey took place quite independently of extension officers, it is still very fortunate that the area was mapped thoroughly by Dr. E.M. Chenery (in 1945-46) as part of a much more extensive soil survey. The only thing which can be done here, is to reproduce the relevant part of Dr. Chenery's survey and supplement it with information from Prof. F. Hardy and observations made throughout the year.
(1) St. Augustine Loam Developed over red-coloured recent wash from Northern range schist foothills. Topsoil, fairly humic, pale to dark yellowish brown, subsoil orange-red to buff. Abundant silvery schist fragments and mica flakes which produce a characteristic greasy feel. Professor Hardy records that the soil is intrinsically deficient in total nitrogen, available phosphate and especially available potash. A formula for a suitable mixture of artificial manures as well as equivalent dressings of pen manure have been worked out.

This soil type is only represented by very small patches just south of the Churchill-Roosevelt Highway, in the survey area. Where present it carries provisions gardens.

(2) Streatham Sand and Loam Deep subsoil or whole profile may contain quartz gravel, marking the line where the Northern Range floodwash slackened its speed. Prof. Hardy records - bleached grey sand to 12 inches; speckled brownish-ochre sand to 30 inches; intense orange and brick red coarse mottling with black hard concretionary spots above, on fine sand to 84 inches; blue grey sand and gravel below. Parent material quartzose Detritus, near foothills - well weathered, highly acid (pH 4.8). Low Watertable. A-Horizon (0-12 ins.) Fine sand 65%, silt-clay 16%, organic matter 0-6%, pH 5.0, available phosphate 4 p.p.m. (parts per million), available potash 20 p.p.m. Characterised by xerophytic vegetation e.g. "aluminium plants" - Melastomaceae. Chenery describes water-table as being perennial at 10-14 feet providing well-water for villagers at Curope.

The soil is highly acidic and very poor in organic matter, available potash and phosphate. It occurs in two main outcrops in the survey area - one in the area south of I.C.T.A. and one about a mile to the east along the highway. The latter is hardly cropped at all while the former is partly waste land and partly under provisions gardens. A small amount of rice is also grown.

(3) Macoya Sand This soil has similar parent materials to the above two soils but has a much better nutrient status than Streatham Sand. Where this soil outcrops in Streatham sand it is interesting to see how it is utilised for food crops whereas the surrounding land is ignored. Little is known of its exact nutrient status. The soil dries out badly during the dry season.

(4) River Estate Sand and Loam A uniform yellow or orange brown coloured soil, compact, hard, sandy to 7 or 8 feet, containing abundant silver and grey schist fragments and mica flakes. This sand rests on old geological quartzose material. Deep water-table on account of channel-cutting by the river: i.e. according to description by Dr. Chenery, prof. Hardy describes colour as olive-greenish-yellow to brown with sepiæ mottling.

The soil is highly acidic, very low in potash and medium low in phosphate. In the survey area it carries provisions, cane and rice. In the area enclosed by the Tunapuna River, Cuyaba River and the Highway, the land is very low lying and the River Estate Sand is used for rice-growing in spite of the fact that it is very free draining. Further to the east and to the south it is also planted to cane and provisions.

Of all the soil in the survey area, River Estate Sand is probably the most easily eroded:

<table>
<thead>
<tr>
<th>P (19)</th>
<th>P (20)</th>
<th>P (21)</th>
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Under cutting. Cave-in-River Blocked. Further under cutting.

Note gouging away of River Bank near Bridge to a depth of 6 - 8 feet.

Below this the soil is clayey and erosion resistant.
Golden Grove Sandy-Loam According to Dr. Chenery:- Developed over bright ochre-yellow parent-material between 6 and 48 or 72 inches depth, underlaid by material mottled aporetically orange-brown or pale reddish-brown. According to Prof. Hardy:- golden colour due to a high degree of hydration. Parent Material weathered old alluvium of former Arocua River over red-mottled detritus. Very free drainage and high water-table but not water-logged in wet season. Fine sand 55%, silt 20%, clay 22%. Mineral status is not very satisfactory.

There is one outcrop in the survey area running parallel to the highway. It is planted mainly with Sugar Cane.

Pasea Clay (pronounced "pahshay") Developed over olive-green clay strongly mottled dark olive-brown, brown or reddish brown. The heavier phases are found nearest the Caroni River and are liable to flooding. The parent material contains abundant mica flakes which confer a silky feel, particularly on the silt fraction. Analysis shows 12.5% sand, 2.1% organic matter, 0.204% Nitrogen and 2 parts per million of available phosphate, i.e., the soil is very deficient in phosphate, and for a clay, low in nitrogen. The pH is 6.1 (i.e. acid) and index of texture 35 (i.e. very clayey).

In the survey area, the Pasea Clay forms the great bulk of the rice-growing area.

Cunupia Clay According to Chenery - Developed over greyish clay, mottled yellowish-brown or orange-brown. Topsoil yellowish brown. The original vegetation was evergreen or semi-evergreen Seasonal forest (not Swamp or Marsh). It is widespread over the sugar-cane lands or Caroni Estate, Woodford Lodge Estate, and the northern part of Waterloo Estate, occupying the lower-lying parts of the Northern Basin. The Pasea clay and the Cunupia Clay are probably the most extensive of all cultivated soils in Trinidad.

The small area of this soil in the survey area was once wholly planted with cane but this has now been almost completely replaced by rice.
**SOIL MAP**

**ST. AUGUSTINE - STREATHAM LODGE AREA**

- **I.C.T.A** Tunaruma R.
- Churchill-Roosevelt Highway
- Orange Grove Estate.
- **St. Augustine Loam**
- **Fasen Clay**
- **River Estate Sand & Loam**
- **Golden Grove Sandy Loam**
- **Streatham Sand**
- **Maccoya Sand**
- **Mor Plains Heavy Clay**
- **Cunupia Clay**

**Crop Distribution Map**

- **Tunaruma R.**
- **Streatham**
- **Caroni R.**

**Note**

1. The Fasen Clay carries most of the Rice.
2. River Estate Sand and Loam carries rice in the very low-lying area marked by Circle; otherwise cane and provisions.
3. That all wasteland that exists occurs on Streatham Sand. Crops which grow on this soil are of a miserable nature.

N.B. By "Provisions" one refers to all food crops.
The climate of the St. Augustine-Streatham Lodge Area is thoroughly understood as a result of the continuity over a period of many years of comprehensive and accurate records kept by the Chemistry Department I.C.T.A. It is sufficient for the purposes of this report to indicate the general climatic picture.

Rainfall: Average Annual, Average Monthly and Intensity (Records Chemistry Department I.C.T.A.)

<table>
<thead>
<tr>
<th>Month</th>
<th>Total (ins)</th>
<th>Total Time rained (hrs)</th>
<th>Av. Rate Precipitation (inches/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>2.61</td>
<td>14.8</td>
<td>0.17</td>
</tr>
<tr>
<td>Feb.</td>
<td>1.05</td>
<td>7.1</td>
<td>0.5</td>
</tr>
<tr>
<td>March</td>
<td>1.43</td>
<td>8.4</td>
<td>0.19</td>
</tr>
<tr>
<td>April</td>
<td>1.96</td>
<td>12.6</td>
<td>0.17</td>
</tr>
<tr>
<td>May</td>
<td>5.60</td>
<td>24.3</td>
<td>0.23</td>
</tr>
<tr>
<td>June</td>
<td>8.07</td>
<td>37.3</td>
<td>0.22</td>
</tr>
<tr>
<td>July</td>
<td>8.57</td>
<td>33.7</td>
<td>0.26</td>
</tr>
<tr>
<td>Aug.</td>
<td>9.37</td>
<td>32.1</td>
<td>0.29</td>
</tr>
<tr>
<td>Sept.</td>
<td>7.70</td>
<td>22.2</td>
<td>0.55</td>
</tr>
<tr>
<td>Oct.</td>
<td>6.35</td>
<td>21.9</td>
<td>0.29 &quot;Petit careme&quot; (1)</td>
</tr>
<tr>
<td>Nov.</td>
<td>7.82</td>
<td>28.8</td>
<td>0.27</td>
</tr>
<tr>
<td>Dec.</td>
<td>6.26</td>
<td>28.2</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Average Annual = 66.89 ins. Total Time rained = 271.4 hrs.

(1) Short drier spell.
The exact correlation of cropping systems with rainfall is not surprising.

Diurnal Distribution of Rainfall This is important in relation to sun-drying of rice and pulses and the application of dusts and other fungicides and insecticides etc.

(ii) "In all months there is a clear tendency for most rain to fall in the mid-day hours, while the driest times are usually a few hours before midnight. January has an unusually high proportion of rain in the early hours of the morning while in April, the rainfall peak occurs between 14.00 hrs. and 15.00 hrs. - later than in any other month. The diurnal distribution of rainfall in the wet season months is generally speaking very similar but May, June and July, besides showing major peaks of rainfall at mid-day, have minor peaks occurring before or about sunrise which consist largely of short heavy showers of non-convectional rain ...... as the wet season progresses, a greater proportion of the daily rain falls in the mid-day hours ......."

The effectiveness of the rainfall can be gauged from the following analysis of rain showers at I.C.T.A.

Table (2)

<table>
<thead>
<tr>
<th>Type</th>
<th>Total rainfall (ins)</th>
<th>Number of showers</th>
<th>Average rain per shower (ins)</th>
<th>Duration of average shower (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wet Seasons</td>
<td>Dry Seasons</td>
<td>Wet Seasons</td>
<td>Dry Seasons</td>
</tr>
<tr>
<td>Torrential (-0.75 ins.hr.)</td>
<td>14.4</td>
<td>0.9</td>
<td>25</td>
<td>2</td>
</tr>
<tr>
<td>Medium (0.74-0.41 ins. hr)</td>
<td>16.2</td>
<td>2.7</td>
<td>45</td>
<td>30</td>
</tr>
<tr>
<td>Light (0.40-0.00 ins. hr)</td>
<td>86.8</td>
<td>8.0</td>
<td>240</td>
<td>87</td>
</tr>
<tr>
<td>Totals</td>
<td>66.4</td>
<td>11.5</td>
<td>510</td>
<td>119</td>
</tr>
</tbody>
</table>

(iv) Records kept were: Daily rainfall records by M.O. Gauge, at 8 a.m. and 4 p.m. and Daily rainfall records by Negretti and Zambra "Natural Syphon" recording gauge.

**N.B.** Torrential rain often largely runs away and is responsible for soil erosion. Light rain is mainly evaporated quickly from intercepting vegetation and the immediate soil surface.

**Temperature:**

The mean monthly maximum shade temperature only varies from 84 to 87 degrees F. The mean monthly minimum shade temperature varies from 68 to 75 degrees F. i.e. the average temperature range throughout the year is from 88 to 87 degrees F. The maximum range ever recorded in any one year was 94 to 54 degrees F. but such an occurrence is extremely rare. The fluctuations in soil temperature are not at all surprising. The absolute values are of great importance also and need to be interpreted by an expert (i)

**Soil and Air Temperature - Records of Chemistry Dept. I.C.T.A. (ii)**

<table>
<thead>
<tr>
<th>MONTH</th>
<th>Mean Monthly Max.</th>
<th>Mean Monthly Minimum</th>
<th>Depth 1 in.</th>
<th>Depth 1 ft.</th>
<th>Depth 4 ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan.</td>
<td>84</td>
<td>69</td>
<td>79</td>
<td>67.2</td>
<td>77.8</td>
</tr>
<tr>
<td>Feb.</td>
<td>85</td>
<td>69</td>
<td>80.2</td>
<td>67.3</td>
<td>77.5</td>
</tr>
<tr>
<td>March</td>
<td>86</td>
<td>69</td>
<td>82.3</td>
<td>68.4</td>
<td>78.5</td>
</tr>
<tr>
<td>April</td>
<td>87</td>
<td>71</td>
<td>84.5</td>
<td>70.2</td>
<td>80.0</td>
</tr>
<tr>
<td>May</td>
<td>87</td>
<td>72</td>
<td>85.2</td>
<td>71.4</td>
<td>81.1</td>
</tr>
<tr>
<td>June</td>
<td>86</td>
<td>73</td>
<td>80.5</td>
<td>70.9</td>
<td>80.7</td>
</tr>
<tr>
<td>July</td>
<td>86</td>
<td>73</td>
<td>81.1</td>
<td>71.1</td>
<td>80.9</td>
</tr>
<tr>
<td>Aug.</td>
<td>87</td>
<td>71</td>
<td>81.8</td>
<td>71.0</td>
<td>81.7</td>
</tr>
<tr>
<td>Sept.</td>
<td>87</td>
<td>72</td>
<td>85.1</td>
<td>71.3</td>
<td>81.8</td>
</tr>
<tr>
<td>Oct.</td>
<td>87</td>
<td>72</td>
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<td>71.1</td>
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</tr>
<tr>
<td>Nov.</td>
<td>86</td>
<td>70</td>
<td>80.8</td>
<td>71.2</td>
<td>80.7</td>
</tr>
<tr>
<td>Dec.</td>
<td>85</td>
<td>70</td>
<td>78.7</td>
<td>68.6</td>
<td>75.1</td>
</tr>
</tbody>
</table>

**Mean 81.5 68.9**

**Humidity and Wind Velocity:**

The absolute figures on wind velocity are perhaps misleading owing to the sheltered situation but comparative figures from month to month are wholly reliable. These show highest wind velocity in April and May and the lowest in August, September, October and November. There would appear to be a strong negative correlation of wind velocity with rainfall and humidity but an imperfect correlation with temperature. The month of April is interesting because it exemplifies the modifying effects of wind velocity on climate. More rain falls in April than either February or March but the wind velocity reaches its maximum for the year in April. The humidity reaches its lowest point both at 8 a.m. and 4 p.m. in April.

(i) This, of course, has been done by the Chemistry Department I.C.T.A.

(ii) **Air Temperature Measurements.**

1. Weekly temperature records by Recording Thermometer (Negretti & Zambra M 2226)

2. Solar maximum temperature; daily records.

3. Maximum and Minimum temperature; daily records.

**Soil Temperature Measurements**

1. Weekly records by mercury-in-steel Negretti & Zambra Earth temperature recorder, M2256, originally at 6 ins, then 3 ins, now at 1 inch depth.

2. Grass minimum temperature; daily records.

3. Ground temperature at 1 ft. and 4 ft. depths; 8 a.m. and 4 p.m.
The soil temperature at a depth of 1 inch reaches its maximum as also does the air temperature. Thus April is a very significant month from the agricultural viewpoint.

<table>
<thead>
<tr>
<th>Humidity and Wind Velocity - Records from Chemistry Dept. I.C.T.A. (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Humidity - %</td>
</tr>
<tr>
<td>Minimum (16 yrs.Av.)</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Jan. 47</td>
</tr>
<tr>
<td>Feb. 62</td>
</tr>
<tr>
<td>March 50</td>
</tr>
<tr>
<td>April 52</td>
</tr>
<tr>
<td>May 56</td>
</tr>
<tr>
<td>June 62</td>
</tr>
<tr>
<td>July 63</td>
</tr>
<tr>
<td>Aug. 65</td>
</tr>
<tr>
<td>Sept. 62</td>
</tr>
<tr>
<td>Oct. 61</td>
</tr>
<tr>
<td>Nov. 61</td>
</tr>
<tr>
<td>Dec. 61</td>
</tr>
</tbody>
</table>

The humidity figures show just what would be expected in way of seasonal fluctuations.

---

**1. Atmospheric Humidity Records**

2. Wet and Dry bulb Thermometer readings in Stevenson Screen at 8 a.m. and 4 p.m.
3. Recording Wet and Dry bulb thermometer (weekly records), Negretti and Zambra M2247.

**Measurements of Wind Velocity**

1. Daily wind records by Cup Anemometer.

2. Wind direction, clouds, state of ground visibility as suggested in the "Pocket for Climatological observations", Form 3100, Meteorological Office, London.

N.B. Sunshine and Evaporation Records are also kept.
SECTION 3.

VEGETATION

The original vegetation of the St. Augustine area has been described by Prof. F. Hardy as being Evergreen Seasonal Forest (Crago - Guatocare - Carat type). "Forest probably fell into ruin (and burnt) soon after St. Joseph district was settled. Formed part of (?) St. Augustine sugar estate for many (100) years; later passed to gardens (1922) when I.C.T.A. was established ...." The Streatham Lodge area was probably characterised by a semi-swamp vegetation - either this or the area became much swamplier after the Evergreen Forest was cut and burnt. In any case, neither in the St. Augustine or Streatham Lodge area does the present vegetation bear any similarity to the original vegetation: in fact, except for some grasses, sedges and reeds .... and a few isolated Cau Cau palms and Coccoloba plants, none of the original vegetation has been perpetuated.

The most that can be done is to list the various plants of the area, most of which have some definite use and most of which are deliberately planted.

Useful or Ornamental Trees and Palms

Coconut (Cocos nucifera). A few palms grown around the home and are utilised for the coconut milk mainly. Crops of nuts are sometimes sold to hawkers who collect a cartload in this way and then sell them on street corners in the larger towns.

Betel-nut Palm (Areca catechu). A few isolated palms are grown by the Indians originating in Madras, in the Streatham Lodge area.

Gru-Gru Palm (Lorococias sclerocarpa). Probably residues from the original vegetation - only a few isolated specimens. The kernel of the rather small fruit is sometimes eaten.

Mango (Mangifera indica). This is the sacred tree for the Hindus and every Hindu family will have at least one. They are also very popular amongst other Indians and are important article of diet (especially in May, June and July) since the fruit is rich in Vitamin A. During religious celebrations mango leaves and small stools etc. made of mango wood are used owing to mystical properties.

Malay Apple or Pommerac (Eugenia malaccensis) (i.e. Lau-Lau in New Guinea). Several houses have one or two trees for the fruit and for ornamental and shade purposes. The tree does not appear to thrive as it does in New Guinea.

Breadfruit and Chataigne (Artocarpus sp). The former is smooth fruited and the latter spiny. Both trees are very widely grown for the fruits though the Indians will not eat breadfruit unless other foods are scarce. Chataigne is a popular food especially among the Madrasi. The trees also provide excellent shade and the gummy exudate which appears when an incision is made in the bark is used for trapping birds. For this reason, many of the trees look unthrifty. Both species were introduced from the eastern tropics.

Varcarind (tamarindus indicus). Several trees are present in the area. The fruits are sometimes used to make a stimulating drink but more frequently a sauce is made as a flavouring for other foods.

Citrus sp. Sweet orange, grapefruit, tangerine (mandarin), limos and a few citrons are grown. Many trees are self-sown and intercrossing has obviously taken place. Some peasants have planted budtings of superior varieties on the sour orange stock (obtained from St. Augustine nursery).

Hog Plum (Governor Plum - Spondias purpurea var. lutea). Commonly grown around the homes. The fruit is relished by children who apparently prefer them green. The tree is propagated from seeds often by accident.

Pomegranate (Chino sp). Probably Chrysobalanus sp. Fruit is eaten.

Chench (Melicocca bijuga). A very tall growing native tree which is only sporadically represented. The fruit is edible.

Saljun (Morinda oleifera). A small tree which is fairly widespread among the Indians. The young leaves and long slender fruits are a constituent of tacula ry.
Star Apple (Chrysophyllum cainito). A handsome tall-growing tree which occurs sparingly throughout the survey area. The fruit is relished by children.

Sapodilla (Achras Zapota). Isolated trees are grown for their fruit and not for the chicle gum which is an important product in other countries.

 SOURSOP (Annona muricata). A few seedling trees are to be observed growing in Kitchen gardens.

Guava (Psidium guajava). Some trees have been planted around the homes but most trees observed were wild.

Avocado Pear (Persea americana or P. gratissima). This tree is quite widespread and is potentially of great importance from the point of view of nutrition. Most of the trees are seedlings but several cuttings of selected clones have been purchased from St. Augustine nursery.

Cashew Nut (Anacardium occidentale). Several trees are dispersed throughout the area. Both the nut and the fleshy "cashew-apple" are eaten. The material surrounding the nut is collected by one person and sold as a manure.

Calabash (Crescentia cujete). An ornamental tree which loses its leaves during the dry season. The large fruits are used as containers for water.

There are several other trees in the area which have been unidentified, e.g. one would appear to resemble Jak fruit (Artocarpus integrifolia) though this has not been confirmed.

Semi-permanent shrubs and small trees - Useful and ornamental

Papaw (Carica papaya). Often grown around the home for the fruit. At present, the plant is dying out owing to the rapid spread of Papaw mosaic which is probably a virus disease. No means of control has yet been devised.

Bananas and Plantains (Musa spp.) Found growing in isolated clumps for home consumption though the fruit is often sold if the market price is high.

Cotton - Sea Island and Marie Galante (Gossypium barbadense and G. hirsutum var. Marie Galante). Sometimes used for stuffing pillows etc. but more often, the lint is used to make wicks for naked lights.

True Castor-oil Plant (Ricinus communis). The leaves are heated and applied to aching heads. The seeds are not used.

Roselle (Hibiscus sabdariffa). Ornamental. Fruits used in chutneys etc.

Korouli (?). Small shrub - Highly scented leaves used as a flavouring principally by the Madresi.

Croton (Codiaeum sp.) and Hibiscus furcellatus. are the two most popular ornamentals and commonly occur around the front of the Indian houses.

Glyricidia sepium (syn. G. maculata). Grown as a hedge plant, for shade and as a windbreak but only on a very small scale.

Dracaena (Cordyline terminalis). Grown as an ornamental and fencing plant around the homes - propagated by stem cuttings.
Pulses and Leguminous Vegetables

Pigeon pea - Cajanus cajan syn. C. indicus.
Gob-gub pea - White seeded cowpea
Black eye pea - Black seeded cowpea
Sesame (bonvist or wadli bean) - Dolichos lablab.
Woolly pyrol - Phaseolus mango.
Hodi - Vigna sesquipedalis or V. sinensis var. sesquipedalis.
Soy bean (French bean or String bean) - Phaseolus vulgaris.
Lima bean - Phaseolus lunatus.
Ground nut (Peanut) - Arachis hypogaea.

Cereals and Grapes providing Food

Sugar Cane - Saccharum officinarum.
Rice - Cryza sativa.
Corn - Zea mays.

Fruits or Flowering parts used as Vegetables

Egg Plant (Meloneng) - Solanum melongena.
Okras - Hibiscus esculenta.
Pumpkin - Cucurbita maxima.
Gouge gourd - Lagenaria sp.
Cucumber - Cucumis sativus.
Tomato - Lycopersicum esculentum.
Cauliflower - Brassica oleracea botrytis.

Leaves and Unexpanded Ruds used as a Vegetable

Cabbage - Brassica oleracea.
Lettuce - Lactuca sativa.
Patchou or pak-choy - (Chinese Cabbage) - Brassica chinensis.
Pui spinach - Basella alba.
Bahi - Amaranthus tristis and other spp.

Condiments, Flavourings or Drugs

Caryll or Caryla - Mornordice cherantia.
Jhingli - Luffa acutangula.
Ginger - Zingiber officinalis.
Radish - Raphanus sativus.
Shallots - Allium ascalonicum.
Rassolle - Hibiscus sabdariffa.
Mango - Manfigera indica.
Meijun - Moringa oleifera.
Tumeric - Curcuma domestica.
Others unidentified are:

Lauki -
Gutputia -
Karopill -

Root Crops

Yams - Dioscorea spp. - mostly D. alata; some D. trifida i.e. cush-cush.
Tannias (Taro Kong Kong in New Guinea) - Xanthosoma sagittifolium (L.) Schott.
Dasheen (Taro) - Colocasia antiquorum syn. C. esculentum.
Eddoes (Taro) -
Sweet potato - Ipomoea batatas.
Cassava (Taplo) - Manihot utilissima.
Tappee-tambou - Calathea allouya.
also:

Beetroots
Turnips) to a very small extent.
Carrots

Weeds and Grasses (a very incomplete list)

1. Soft or Woody herbs and small shrubs.

Melenthera nivea - Dog bush - soft shrub in secondary growth after crops.
Spinthes uliginosa - branching herb in well watered situations.
Isocarpha billbergiana - especially found in rice-fields after harvesting.
Syndrella nodiflora - common in gardening areas and on roadsides.
Jussienia suffruticos - erect woody herb - of general occurrence.
Jussienia decurrens - a bed weed in rice cultivation.
Euphorbia hirta (syn. E. pilulifera) - Common in dry season on sandy soil.
Ericostoma vircillacattum - Not very widely distributed.
Hydrospo spinosa - Viscid herb, woody at bases - bed in rice land.
Malachra alcofolla - Hispid sub-shrub common in higher spots.
Eupatorium odoratum - Christmas bush - in uncultivated lands.
Urena lobata - Cousin Makohe - gardens and uncultivated areas.
Stachytarpheta cayennensis - Woody herb often appearing after cane.
Flesingia succirfera - Wild Hops - Not an indicator of rich soils as supposed.
Borreria Verticillata - white Broom - common in provisions gardens.

Hyptis pectinata

Hyptis sp. probably capitata

Pseudo-elephantopus spicatus - "Man-better-Man" - common.
CORDIA MACROSTACHY 

SIDA Glomerata, Acuta and Linifolia - All of general distribution and said to be one of the worst weeds - used for tying thatch on houses.

 Mimosa pudica - Widely found in cultivation and grazing land.
Bidentes pilosa - Relsewy Deisy - soft annual herb.

Dosidium adenocarpon, Barbetum and triflorum - savannahs and waste places.

Argemone mexicana - Mexican poppy - rarely found.

(2) Grasses - Useful and Harmful.

Bambusa vulgaris - common or Indian bamboo - has a great variety of uses e.g.rough building, drain-pipes, firewood, fencing. Commonly found along creek banks where it is a useful soil binder though too shallow rooted to be ideal for this purpose.

Paspalum conjugatum - Sour grass. Eaten by stock when food is scarce - more of a weed than a food. Common in cool moist situations.

Axonopus compressus - Savannah grass. A useful grass which does not compete well with other grasses and suffers during dry spells. Found along drains, bunds and roadsides.

Cynodon dactylon - Devil's grass, Bermude grass (Couch grass in Australia). Not very widespread but relished by stock where present.

Cymbopogon citratus - Lemon Grass. Grows in clumps around the homes in kitchen gardens. Used as a scent and flavouring.

Eleusine indica - Foxtail. (Crap grass in Australia). Very widespread, unpalatable and a bad weed in cultivation.

Paspalum fasciculatum - Bamboo grass. Eaten by stock if mixed with other grasses. Is commonly used as a litter in stock pens - very common along roadsides, bunds and waste places - may take possession of rice fields in dry season.

Imperata sp. - Needle grass. Used as a thatch for housing, otherwise a weed.

Rottboellia ovata - Corn grass. Only occurs on the better drained areas around bamboo clumps etc. Eaten by stock when young but becomes fibrous and unpalatable when mature.

Sporobolus indicus - Tapia grass. A weed in cultivation, of practically no use as a fodder but its fibrous nature renders it suitable as a binding material when tapia is made.

Stenotaphrum secundatum - St. Augustine grass. Not very widespread - quite a good fodder grass.

Paniceum purpureascens - Para grass. (syn. Brachiaria mutica). One of the best fodder grasses available but only of limited distribution. One Indian (Dhooli Singh) has about ½ acre planted to this grass specifically for stock feed.


There are other grasses which are bad weeds of drainage and irrigation channels - Paniceum mortensii, P. trichoides and P. grande, Ichnanthus sp., Rynneacanthus amplexicaulis and H. doneicifolia.

Another grass which is grazed is Echinochloa colonum (barnyard grass). also one or two Setarias.

(3) Sedges. This group of plants contains some of the worst weeds in the Survey area. One cannot overestimate the effect of, say, nut grass (Cyperus rotundus) on yield, labour requirements during growth, etc. Other sedges in the survey area are:-

Kyllinga brevifolia and pumila
Pycreus polysaccharis and pumilus.
Cyperus lusuluea - very bad in rice-fields.
Cyperus distans and rotundus
C. digitalis - a tall growing species - bad in drains and channels.

Torulimum Fermi
Eleocharis caribaeae
E. subtilltis Both bad wees especially in wet season.
PART IV - PEASANT AGRICULTURE OF AREA

SECTION 1. - TYPES OF PEASANT FARMERS AND THEIR DISTRIBUTION

SECTION 2. - LAND TENURE

Background of smallholding tenure in Trinidad.

Land tenure in the Survey Area.

A. Cane farmers on Orange Grove Estate.
B. Mixed Cultivators of Streathem Lodge
C. St. Augustine Area.

Land Inheritance in the Survey Area.

SECTION 3. - THE AGRICULTURAL SYSTEM. (for summary see page 47)

SECTION 4. - LABOUR SERVICES & WAGE EARNING (for summary see page 66)

SECTION 5. - INCOME & EXPENDITURE
The term "peasant" in this report is used for the want of a better word. There are some true peasant agriculturists in the area who work their holdings with family labour and produce both subsistence and cash crops. Most however, spend a considerable amount of time on the Sugar Estates as Wage-Labourers. Others produce mainly for cash and only to a small extent for subsistence. Employment of "outsiders" is also a common feature of their production.

**SECTION I**

**Types of Peasants and their Distribution**

Though the people in the area are essentially the same, they can be classified according to their land-use. On this basis, there are three types of peasants:

1. **The Cane Farmers** on Streatham Lodge Estate land, supplying Orange Grove Factory (Trinidad Sugar Estates Ltd.) with cane as well as producing a variety of provisions crops (including some rice in the rice area), for market and home use.

2. **The Rice or Padi growers** in the lower St. Augustine area who have land on the irrigation area. Rice is the main crop but many food crops are grown on the riceland during the dry season. Other provisions crops are usually grown as subsidiaries on land away from the rice area.

3. **The subsistence and market-gardeners** in the upper St. Augustine area growing provisions crops as their main agricultural activity. This group is more dependent on labouring for the neighbouring sugar estates than the first two groups. They usually have a small area of riceland in Streatham Lodge, the lower St. Augustine area or Bejucal.

All three groups have kitchen gardens around their homes.

The riceland is quite distinct from the cane land and provisions land. The two latter overlap considerably though provisions gardening has become completely divorced from cane-growing in the Upper St. Augustine area (i.e. just South of the Churchill-Roosevelt Highway). The rice area around the Tacarigua River is referred to as the Lower St. Augustine area.

(See Map).
PART IV.

SECTION 2. - LAND TENURE

Background of Small-Holdings Tenure in Trinidad

The original land tenure policy in Trinidad was designed so that estate labourers could not become independent of the estates for their means. Thus, as far back as 1838, an Order of Council made the acquisition of land by emancipated slaves virtually impossible. This was strengthened by increasing the cost of Crown Land (in 1847) to a point where Labourers could not afford it; but nothing could entice the emancipated slaves back on to the Estates (1). "Squatting" took place on a large scale but was overshadowed by the solution of labour troubles using imported East Indian indentured labourers. Competition for employment became keen and squatting increased. About 1870 this problem was tackled by surveying the areas, giving titles where occupation was legal, and providing terms by which illegal squatters could purchase their land. Spasmodic sale of Crown Land in small lots on condition of a purchaser continued up to the First World War. This method of alienation was wholly unsatisfactory from the agricultural viewpoint because the proprietor was left with very little capital on which to operate after purchasing his land. The holdings were "mined" heavily until they became exhausted and were then abandoned. Such sales of Crown Land were entirely in the hands of the Wardens and Ward Officers who provided for their friends and relatives in this way, without regard to their ability as farmers.

After the slump of the sugar industry, a means of obtaining the use of land without the expenditure required by purchase of Crown Land became possible on a moderate scale. Most of the bankrupt estates were bought up by surviving estates and amalgamated into larger units; but some were not worth buying and with others, the owners preferred to remain as landlords rather than sell out. These estates were rented out principally to Indians whose contracts had expired. "Cane-farming" (11) which was soon to become an important aspect in Trinidad's economy developed to a large extent on these areas.

In 1917 the Indian Government prohibited the further emigration of indentured labourers. Subsequent to the depression which followed the first World War, this had a profound effect on the lands policy in Trinidad. Repatriation of Labourers continued and the labour demands of the Oil, Asphalt and other Industries rapidly increased. It became necessary to entice the Indians whose contracts had expired, to remain in Trinidad rather than to return to India (111). There followed, a definite policy of making land available to them. The Government took large areas and offered allotments at the current price of Crown Land. These areas were termed "settlements". The Sugar estates encouraged cane-farming both on their own land, when the Indian cultivators became tenants, and on the allotments owned outright by smallholders.

Unfortunately, selling Crown Land on a freehold basis did not lead to any better land use than it had previously and in the early 1930's some attempt was made to alter this. Land was offered at a rental of 96c/acre/annum with the option to purchase freedhold after 2 - 4 years. It was hoped that the opportunity of paying for the land in instalments would render it unnecessary for the owner to "mine" the soil and that the properties would not be abandoned as the others had been. There was still very little selection of settlers and the modification did not work satisfactorily.

Gradually, alienation of Crown Lands has passed out of the hands of the Ward into the hands of the Agriculture Department and the position has improved. Just prior to the second World War, the sale of Crown Land ceased and now lots are leased for 25 years with the option of renewal for a further 25 years. Moreover, the applicants for land must fulfill certain requirements as regards intentions and skill in agricultural pursuits.

(1) It is said that the West Indians have no agricultural inclinations, but the 1938 Order of Council and the subsequent price required for purchase of Crown Land were designed specifically to prevent them from becoming peasant proprietors. They either had to work as agricultural labourers or leave the land altogether - the latter course was taken.

(11) See Appendix on Cane-Farming. (c)

(111) A shortage of agricultural labour existed up till the Depression in the early 30's when once again there was a surplus (See "Agricultural Labour in Trinidad" - Prof. C. Y. Shepherd). After this Depression, price rises but incipient mechanisation of the sugar industry and increasing population by natural means has prolonged this condition of shortage of employment. There has only been one temporary shortage due to construction of the American Bases since 1930.
Thus, smallholders in Trinidad have gained the use or the ownership of land in three principal ways:

1. By becoming a cane farmer on estate land.
2. By renting land from a more or less bankrupt estate.

These were the primary methods but having obtained land there has been a certain amount of trafficking in titles and leases. Outright sale of land between smallholders appears to be decreasing while trafficking in leases, except by cane farmers on estate land, would appear to be increasing.

**Land Tenure in the Survey Area**

Of the three methods of acquiring land or leases to it, noted above, the second and third methods are represented. The first method operates not far away at Orange Grove and will be described to make the comparison complete.

**The Cane Farmers on Orange Grove Estate Land.** These cane farmers like all cane farmers in Trinidad, are registered with a particular factory and are required by law to sell their cane to this factory. In this case, where the cane farmers occupy estate land, the relationship between the buyer and seller of cane goes much further than is implicit in registration. The latter is a measure designed to protect the factory from such uncharitable cane farmers who would obtain an advance from one factory the security of their crop (the return from which was debited according to the amount borrowed) and then sell their cane elsewhere or under a different name.

At Orange Grove (Trinidad Sugar Estates Ltd.), the arrangements with cane farmers is as follows: Of a total area of 8,000 acres, 2,000 acres are planted to cane by the estate and a further 2,300 acres are rented out to 1,800 to 2,000 cane farmers. Each farmer will have 2 - 3 blocks as an insurance against complete loss in the event of fire, flood, frog hopper attack etc.

House lots with small garden lots attached are also provided. Thus each cane farmer has 1/4 to 1/2 acres of land. Building the house is the cane farmer's own responsibility. The annual rent is:

- Canelands - 10/- per acre/annum
- House lots - $6.00/annum.

In connection with his cultivation, the estate will on demand plough up a man's land and deduct the cost against the return from his crop. The estate knows each farmer and his land intimately through a Cane Farmers Manager and two inspections of the crop during its growing period are carried out under his supervision in order to estimate the total amount of cane which the factory will be called upon to handle. Also, the estimated yields are used as a basis for advancing credit to the cane farmers. Advances up to one-third of the estimated value of the crop are offered at the rate of 6% annum but most loans are repaid within six months, the actual interest charged being 3%.

Tools and fertilisers are provided at cost price and the peasants are bound to apply this fertiliser as directed by the estate. Due to the cane farmer's method of inter-planting cane in its early stages with food crops, the cane does not monopolise the use of the fertiliser. In this respect the estate has adopted a surprisingly far-seeing policy of permitting the use of fertiliser in this way. Many other estates do not permit this. Since the cane farmers will intercrop and since it provided them with fresh food it is of course to the estates' advantage to encourage the use of fertiliser in this way to prevent soil exhaustion.

The estate maintains roads, keeps main drains clean and constructs bridges which will carry the heavy traffic required by machinery even in the worst weather. Maintenance of subsidiary drains running through his land is the responsibility of the cane farmer.

If the farmer has no transport facilities for carting his cane to the factory, this is done by the estate for a fee which is deducted from the value of his cane. Payment for the cane is made fortnightly but the cost of services rendered by the estate is deducted over a long time rather than all at once. Farmers are given a "pass" stating when he is to start cutting, this control being necessary to ensure continuity of supply to the factory during the crop. This regimentation leads to some dissatisfaction. In spite of their conditions the Indians are still extremely suspicious of the estate and feel that the scales are fixed to weight light etc. When dirty cane or cane with too much "top" is rejected they feel that they are victimised. Sixty percent of the cane farmers perform labouring work for the estate. Yields of cane from estate as compared with peasant grown cane are...
as follows:

Av. Estate = 30 tons/acre for a plant crop and two ratoons.
Av. Peasants = 15 tons/acre

i.e. The estate is producing two-thirds of the annual output of sugar from Orange Grove Factory (approx. 10,000 tons) from less than half the area under cane.

B. The Cane, Rice and Mixed Cultivators on Streatham Lodge Estate

Streatham Lodge Estate, about 350 acres in extent was once a cane growing concern with its own factory; but like many other estates, it succumbed to trying economic conditions of the last decade in the nineteenth century. A large part of the estate is low-lying and not sufficiently well-drained for cane to be grown efficiently. The heirs to the estate did not look to alternative crops (i) and chose to remain simply as landlords and break the estate up into small blocks for renting to smallholders. Their sole interest consists of collecting the rents and there is no fear of shortage of tenants with the local pressure on the land. The landlords have no interest in the utilisation of the land and the tenant is free from interference from year to year provided he pays his rent regularly. The land is owned by three people but there is only one title. One receiving half the revenue is resident in England and the other two (man and wife) share the remainder equally. They live in Trinidad. The estate is administered through a manager who appoints an overseer to collect the rents. The present manager is immobilised due to old age etc.

Areas rented to each family are usually of the magnitude of one acre, often in two or three lots. The rents are:

Biocane $10.00/acre/annum accounts for 150 acres
Canosland $7.50/acre/annum 100 acres
Houselots $4.00 to $8.00/acre/annum 50 houselots
Pastureland ? ? roads, traces, etc. 10 acres
Remainder $7.50/acre/annum (mixed garden lots) 80 acres

These rents, which were operating several years ago have been stabilised at this level by law. The manager holds that these rents are insufficient to maintain the roads and traces in a decent state. The peasants build their own houses and obtain water from wells.

There is no written lease, the lessee's name being simply entered in a register. Sub-letting is permitted but not wide-spread. There is however a fair amount of trafficking in leases, e.g. the lease of an area of $4/ acre was made over to a new lessee on payment of $190.00 to the previous lessee. Even more exorbitant prices have been encountered. Compensation for improvements is required by law for a quitting tenant but none quit because of land scarcity. Leases are on a year to year basis but the policy has been to leave families on the same piece of land and even on death of the parents, the sons still have first preference for the tenancy.

Relatively few of the tenants live on their holdings owing to their low-lying nature. Thus the Indiens originating in the Northern India live for the most part on the North side of the Churchill-Roosevelt Highway. The Indiens of Madras origin have no objection to living in swampy surroundings and live on their holdings.

C. The St. Augustine Area

The tenure of this land is virtually freehold although in actual fact the land titles to blocks of various sizes were sold on a 99-year lease the only conditions being that the Crown can resume without compensation for Railways, Roads, etc., if the part resumed does not exceed one-twentieth but compensation can be demanded for buildings, etc. As far as can be gathered the land was alienated after the first world war (ii) and sold at the rate of approximately $30/acre. The amount of land alienated in this way in the St. Augustine area was about 500 acres. The Titles are transferable.

Land Inheritance in the Survey Area

On the rented holdings of Streatham Lodge there is no inheritance of land, but if a tenant pays his rents regularly, his wife takes over the lease on his death. The eldest son receives preference when she dies, and so on. In the St. Augustine area where the tenure is freehold, land inheritance follows Indian custom, i.e. on death of the father, the land passes to his wife and on her death it is split up amongst the sons. The effects of this practice are reduced by the increasing extent to which Indian Society is becoming graded as a result of education. Many enter various professions, trade and work other than agriculture. There has been insufficient time for the practice to exert its full effect.

(i) Much of the area is eminently suited to rice-growing.
(ii) One title for 2 acres, 3 penches cost $131.16 in 1919. Another sale of
3 roods, 38 perches in 1919 cost the buyer $59.40.

Some of the original buyers of the land or their wives are still in possession and either sale or sub-division is imminent. Since the holdings are divided (perhaps only small pieces here and there could be purchased), there is also a danger that fragmentation will become much more formidable in the future. Shortage of land, purchase of lots in widely separated areas together with increasing population (1) must have their effects. One man has land around his house in St. Augustine, land one mile away in Streatham Lodge, land six or seven miles away in Bejucales and more land in the Arenjuez area about three miles away. He has four young sons.

Freehold has in fact meant license and permanent loss in fertility has resulted. The fact that it is not much worse is no credit to the manager of Streatham Lodge / the past Department of Agriculture but simply to the "manure-mindedness" of the Indian Cultivators. The policy of Streatham Lodge is apparently that they have nothing to gain by insisting on good cultivation for it would be an added expense which would not produce more rent for there is keen competition even for the poorest land. Up till recently, the Department of Agriculture has not had a policy for peasant agriculture and now that they have, lack of trained staff means that the policy might just as well be non-existent. The position (except for a few isolated areas) is not likely to change for a good many years.

(1) See Appendix (A).
PART FOUR CONTINUED.

SECTION THREE THE AGRICULTURAL SYSTEM.

SUMMARY:


A. The Sugar Cane Mixture.

B. The Rice Rotations.

C. Provisions Gardening.

D. Household Gardening.
Perennia food plants - Annual food plants - Condiments and Flavourings - Fruit trees - ornamentals etc. - Importance.

2. Livestock in the Agricultural Picture.
Importance - Cattle - Types and uses - feeding and management. Goats - Donkeys - Poultry - Ducks.
The type of agriculture carried on in the St. Augustine - Streatham Lodge area consists of regularised systems which the Indians have evolved in accordance with the characteristics and traditions of the people, the land tenure, the plants and animals which are available, the soil, the climate and the labour requirements of the sugar estates. It is designed both to provide food for the home but more particularly as a means of obtaining cash for purchases. There are examples of people who produce solely for subsistence to the extent that they produce at all, and there are others who sell a very high proportion of their produce; but the great majority aim at compromising between these two extremes.

1. The Cropping Systems

There are four distinct cropping systems:

A. The Sugar-cane Mixture involving a crop of "plant" (i) cane, usually three yam crops, but also food crops between harvesting and re-planting times and during the early stages of cane growth. The subsidiary crops are only grown during the wet season and are: Sweet potatoes, pigeon peas, okra, eddoes, corn, cucumbers and beans.

B. The Rice Rotations - Padi is the main or wet season crop but the padi-fields carry okra, tomatoes, cucumbers, cowpeas, woolly pyroli and egg-plants during the dry season.

G. Provisions Gardening - Neither cane nor rice is produced, the land being planted partly in yams, bananas, eddoes, cassava, pumpkin, cabbages, lettuce, peppers, pigeon peas, cucumbers, badi and french beans, corn, okra, etc., during the wet season in various mixtures to be described later. During the dry season, the crops are almost the same as those on padi fields.

D. Household Gardening - odd vegetables, spices, flavourings and fruits are grown around the house in a more or less haphazard fashion e.g. Amaranthus, turmeric, ginger, water bean.

A. THE SUGAR CANE MIXTURE.

A brief general history of cane production by small-holders is given in Appendix C. It is proposed here to introduce the subject through a brief discussion on the changes in the importance of cane-farming in the survey area; but this actually follows on from Appendix C.

Sugarcane was the first crop to be grown commercially in this area and up to twenty years ago, the greater part of Streatham Lodge and much of the St. Augustine area was devoted to the growing of cane. In Streatham Lodge, cane is still grown extensively though it has given way to rice in areas suited to this crop. In the St. Augustine area, cane-growing has become gradually reduced since 1920 but particularly during the 30's, for two main reasons:

(1) Much of the land previously devoted to cane became building land. In 1920, R. C. T. A. accounted for a fair chunk but more important, the area south of the College has developed into an Indian community and houses with their kitchen gardens have all but squeezed cane out completely.

(2) The profitability of food crops was increasing and many people gave up or reduced the extent of their cane farming on this account.

By 1942 the amount of cane grown in the St. Augustine area no longer justified the maintenance of scales, derricks and railway-line from Orange Grove to St. Augustine. Again, in 1946, Coroni Limited resumed an area of 80 acres previously let out to cane farmers.

With the war, the labour demands of the American Base removed many cane-farmers and on returning, these as well as the others are emphasising the trend in favour of more provisions gardening and reduced cane production.

(1) The first crop after planting is the "plant crop". Subsequent crops without replanting are "rotation" crops.

(ii) These scales were situated where the Churchill-Roosevelt Highway now crosses the southern line of Trinidad Government Railways.
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1945 Jan necessarily grown with cane Several may be omitted depending on the fancy Feb of the grower and the vulnerability of the block of land to praedial larceny March

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Outline of the System

For this system of cropping, long cambered beds 22-24 ft. wide with rather deep drains between them are built up. Especially during the wet season, an efficient drainage system is necessary but it is probably overdone in many instances and the ground becomes almost bone-dry during the dry season. Former estate practice consisted of planting the cane in short rows across the cambered beds about 4-5 ft. apart. This method is still widespread among the smallholders or “cane-farmers”. The estates have however dropped this method in favour of having four or five rows of cane 4-5 ft. apart running longitudinally along the cambered beds since this facilitates the use of mechanical implements for tillage and other operations.

A Canefield prepared for planting entirely by mechanical means. Note depth of drains and convexity of beds. (Woodford Lodge Estate)

\[ P (28) \]

Many peasant cultivators have also adopted the longitudinal rows without the reasons that the estates have for it except that less damage is done to the stools when cutting the cut cane off the field.

\[ \text{Fig. (2)} \]

Still Used

Commonly amongst cane Farmers

Now adopted by estates (4 or 5 rows)

The cane farmers are roundly criticised for slavishly copying the estates in their cultivation as far as they are able; but in the absence of any other guidance it is to the credit of the cane farmers if they emulate the methods of those who are presumably enlightened regarding cane cultivation. It is no cred –it to the estates or to the Trinidad Department of Agriculture if the example is a bad one and the very willingness of the peasants to adopt what they think must be better methods is a trait which should be useful to those with more constructive criticism of peasant agriculture. The construction of long cambered beds with deep drains irrespective of situation is just one example of copying and the farmers probably waste a lot of time and energy in higher areas in building them. Once constructed, periodic cleaning of the drains and core-ful cultivation is sufficient to maintain the desired shape.

In preparing the ground for sugar cane and associated crops, the land is either ploughed (1) or forked up by hand as soon as possible after harvesting the last root crop to be taken; Cane cutting is carried out over the period from late February to the middle of May. A fairly fine tilth is obtained in preparation for the main planting period during May, June and into July, i.e. just before and just after the wet season sets in.

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(1) Ploughing is done by using a pair of oxen and a single-furrow-mouldboard plough. This may be the canegrower’s property or belong to a ploughman employed for the job. The usual cost is about £14.00 per acre i.e. £2:15:4d. Sterling. (£1.00 B.W.I. = 4/2d stg.)
All subsidiary crops in the cane mixture may not be grown together. If
eggplants is the main subsidiary crop, it is grown in a mixture with corn in hill-
ed rows 6 ft. apart. When peas and okra are the main subsidiaries they may be
planted separately in alternate rows or they may be planted together in the
same row. In both cases, eggplants and corn may be planted in odd spaces between
the pea and okra plants. Beans and cucumbers are sown in the shallow furrows
between the rows of peas and okra or between the rows of eggplants; beans, cucum-
bbers, eggplants and corn are early maturing and come to fruition rapidly.

When harvested the branches from the pigeon peas spread into the space
they occupied.

In August, the peas and okra are "hilled-up" leaving long, deep furrows be-
tween the rows. Cane is planted in these furrows and will be well established
by the time the peas and okra are finished. Then the cane is fertilised and
manured, and the hilles between the rows of cane previously carrying peas and
okra are flattened out.
Breaking the Banks

Fon manuro placed around cane at Rompin's foot - Grass cut from bank (behind hoe) for stock-feed.

P (35)

Splitting the bank - half turned into one furrow - other half turned into other furrow adJoining the bank.

After the pons and okras have been uprooted and the banks levelled, another crop of cucumbers may be obtained before the cane gets too big.

When sweet potatoes are grown, this system is modified. Preparation of the land may be the same and a crop of the quick maturing plants like cucumbers, corn or beans may be obtained before the sweet potatoes are planted. Usually however, the land is rested until September when the beds are dug into a system of hills and furrows running across the embanked beds. Sweet potato slips are then planted along the top of the hills in September - October and at the same time or soon after, cane is planted in the furrows. Harvesting of the sweet potatoes takes place in February - March of the following year by which time the cane has become firmly established without altogether having taken possession of the land. After the potatoes have been dug, fon manure is placed around the cane stools in the furrows and the hills are flattened out around the cane as above. An early crop of cucumbers may now be planted between the cane rows but this is not very common. With the advent of the wet season the cane sprouts vigorously and further inter-row cropping becomes impossible.

Another variation on the same theme involves the growing of tomatoes. When grown with cane, tomatoes are planted in June or July. Tomatoes sometimes become a major subsidiary as in the photograph below when the only other crop concerned is cucumbers. In other cases, tomatoes are planted together with pigeon pons, okras, etc., and play an unimportant part. On the whole, this crop is not very popular in the cane mixture.
Noto tomatoes hilled up and cane in furrows - cucumbers scrambling in blank spaces.

Usually a scodd-bed is prepared and the tomato seedlings are transplanted to the field when a few inches high. About three seedlings are planted together 3 ft. 6 ins. - 4 ft. apart with a little pen manure around the roots. The plants are not staked but are "molded-up" in August leaving the furrows ready for the cane planting to follow. The tomatoes will be harvested in late November and December and the yields are usually very poor and for that reason not a great deal of tomatoes are grown in this way. Reference to the section on climate will show that both the mean monthly maximum temperature and the mean monthly minimum are quite a few degrees lower during the dry season (November, December, January, February, March, April). This slightly lower temperature results in a better setting of fruit when tomatoes are planted during this period. The slightly higher temperature during the wet season interferes with the setting of fruit and yields are consequently very poor. On the other hand, the price obtained is very good.

Details of Cultivation Methods for the individual Crops

Propagation, Planting methods, Manuring, after-cultivation, yields and marketing etc., have not been described in the foregoing outline of the system. Individual crops will be taken in turn:

1. Sugar Cane

Planting material.

The planting material preferred by the cane-farmers consists of the "cane-top" i.e., the terminal shoot with about 1 ft. 6 ins. - 2 ft. of softish stem. This is termed the "soldier-cane" or "soldiers" for short. The tops discarded during the cane harvest will not be available for planting three months or more later. Those tops are fed to cattle and the cane-farmers have access to those discarded by the estates (after the estate has obtained sufficient for their own stock) free of charge, providing they have worked fairly regularly for the estate. Other labourers also have this privilege.

Old Mohammed collecting cane tops after "the crop" has been taken. Note the stage of wood growth. The crop taken was the fifth rettoon-secondary growth is heavy and rows have been obscured. Hein wood is wilf hope - Flemington maccifers.

Sugar cane growing does fit in rather well with the keeping of livestock especially draught cattle. Those supply power for ploughing and cutting the cane and receive the tops as food at "crop-time".

When the cane-farmers harvest their cane, they wish to realise on the whole crop and do not usually retain any for replanting. They rely almost entirely for this on Orange Grove Estate which reserves an area of a suitable variety expressly for the purpose of providing cane-farmers with planting material. The Strother Lodge growers obtain "Soldiers" at $2.00/1,000 while the cane farmers on estate land obtain a large proportion of their planting material free of charge.

Planting. The soldier canes are planted in the furrows between the other crops grown on the hills. The stem is buried at an angle (sometimes almost horizontally) with the terminal shoot and leaves protruding.
The furrows are 4 - 6 ft. apart and the tops are planted in pairs 1 - 2 ft. apart in the rows. Each acre requires about 5,000 tops. Later, the axillary buds sprout and the top of the mother cane is cut off and fed to cattle.

In the absence of sufficient soldiers to complete the planting, the peasants use "sets" from the more mature parts of the cane stem which the estates themselves use. These consist of lengths 1 ft. - 1 1/2 inches long carrying at least three nodes. This method of planting requires 1/2 - 2 tons of sets to plant one acre. The peasants prefer to use soldier canes because they are cheaper and because the cutting of the mother cane after sprouting provides feed for stock.

Manuring. Fert manure is not applied when the sets are planted but a fairly heavy dressing is given when the hills are broken down in December. At the same time, superphosphate of ammonia is applied at the base of the stool at the rate of one handful per stool - i.e., about 400 lbs. per acre. Another dressing may be given in June or July and a sunny day is chosen to avoid loss by leaching during a heavy downpour. In the Strethen Lodge area, manuring depends on the capacity of the grower to get the manure to the field; and the state of the roads often renders this impossible especially in rainy weather.

After cultivation.

A thorough weeding is given in December when the banks are flattened out and at the same time the mother cane (terminal shoot of the planting material) is cut and fed to stock. Immediately this is done the land is forked over thoroughly between the rows. In May or June the flush of weed growth accompanying the early rains is pulled by hand and stacked in heaps to rot. At the same time the dead leaves on the cane stems are stripped off, this process being known as "trash"ing.

Weeding is carried out with a hoe, the weeds and trash being collected up into heaps and allowed to rot.

If the farmer has time he may repeat this weeding and trashng in August-September though it is often omitted. After this, the cane can more or less suppressed wood growth and nothing else is done until harvesting time in February to May of the following year. By this time the cane is 17 - 19 months old.
The cane is hand-cut with a cutlass, "topped", trimmed and later loaded on to a cart. (See picture on following page). About 50% of the farmers do not possess carts of their own and these employ a neighbour or if the estate has carts available these may be employed and a corresponding deduction made from the farmer's return. Trucks are becoming more widely used and are making it possible to grow cane profitably in areas relatively distant from the factory; but motor-trucks are not used at all by the Streatham Lodge growers.

The time of cutting as far as the cane-growers are concerned, is dictated by the factory which handles the cane. Once the factory starts working it is essential that the supply of cane to the factory is continuous. The rate of cutting of the estate's own cane and the rate of cutting of farmers' cane must not exceed the factory's capacity to grind it. Especially if the cane has been burnt, a delay in grinding results in a considerable loss of sucrose and the formation of substances which interfere with its proper extraction. In some parts of Trinidad, when a farmer wishes to have his cane harvested quickly, he has fired it so that it must be cut immediately if sugar is not to be wasted.

Diagram cutting a heavy crop of cane grown on peasant holding. I.C.T.A.

This is done in Streatham Lodge area where cutting has always been completed before the wet season interrupted such operations. In other areas where labour trouble is encountered and cutting delayed, firing the cane has been used as a weapon by cane-growers to ensure that his crop would be harvested.

Orange Grove factory issues "passes" to farmers which entitles them to start cutting. Without a pass, the cane would not be received by the factory. This system has solved the problem of discontinuous supply of cane but has indirectly given rise to a great deal of dissatisfaction among the farmers. Once having started to cut his cane, the farmer is anxious to have the job completed as soon as possible so that he can proceed with other crops which demand attention at the same time. The result is that there is always a string of carts waiting to have their cane weighed and unloaded. The line of carts sometimes stretches from the factory out onto the Churchill-Roosevelt Highway i.e. up to half mile long. A grower may waste several hours in this queue - a waste which is probably unnecessary. Estate grown cane is loaded onto trucks on rails and these form a concentration at the factory during the day and keep the factory going at night when they are mechanically unloaded. Farmer's cane however is not loaded onto rail-trucks owing to the shortage of trucks and rail space, but is unloaded by hand direct onto an elevator feeding the grinders. This hand unloading direct onto the elevator is apparently the cause of the trouble because the cane often arrives at the factory faster than the elevator can handle it.

The apparently easy solution of having fewer farmers bringing more loads per day is unsatisfactory because there are always defaulters who fail to work according to schedule and the factory, to avoid the risk of a stoppage must err on the safe side by granting passes to more farmers.

The solution as it was soon working in Barbados consisted of having a hoist, which can rapidly remove the cane from the farmer's cart, temporary standing space for cane which cannot be ground at the moment of its arrival and mechanical devices for feeding this cane onto the elevator. Without delays then, it would be possible to have fewer farmers bringing more loads: a surplus just large enough to compensate for defaulters could be maintained on the temporary standing space without danger of loss. If the farmer could cut and deliver his cane in six to twelve days instead of 2 - 4 weeks, the extent to which cane-cutting clashes with other gardening operations would be much reduced and relations between cane-growers and estates would be improved.
Yield. The average yield from farmers cane for a "plant" crop and two re-plantings is 15 tons/acre of cane. The corresponding yield from estate fields (Orange Grove) is 30 tons/acre. This divergence does not result entirely from a difference in efficiency of the magnitude suggested by the figures for yield. The cane-farmer has quite a different economy to the estate and as well as his 15 tons/acre, the peasant farmer has probably roamed a crop of beans, corn, okra, tomatoes, peas and perhaps sweet potatoes and two or three crops of cucumbers from the same piece of land just before or during the growing period of the cane; but even if the gross value of the produce of one acre of peasant land is not very different from the gross value of products of one acre of estate land the production costs of the latter are very much lower than those of the peasant. This is mainly due to mechanical methods which are often both cheaper and more effective.

A "chiseller" at work on Orange Grove land. This is favoured nowadays because it does not bring the subsoil to the surface as implement at left.

Rail transport of cane on Caroni Estate is fairly cheap and maintenance costs are low.

Price. The price paid by the factory to cane-farmers at present is $6.24 per ton and is fixed annually in accordance with Schedule 3 of the "Cane Farming Control" Ordinance 1928, which prescribes adjustments in price paid to farmers as the market price of sugar fluctuates. Up till 1922 the number of cane-farmers varied directly with the price of sugar and falling prices made it necessary for the manufacturers to give what amounted to a minimum guaranteed price so that the low cost cane-farmers would be encouraged. With mechanisation getting properly under way in about 1938-39, price ceased to be over-riding importance in governing the number of cane-farmers. (See Appendix on "Cane Farming Data"). This movement is actively discouraging cane-farming on estate-owned land.

Varieties. B.H. 1012 is the variety which Orange Grove Estate makes available to peasant farmers owing to its characteristic of shedding its trash, making it easier to handle. It yields less sugar than other varieties in use by the estate e.g. varieties of the "H" series - 37172, 37161, 3337, 34104. The latter two are relatively new and look promising.
An important crop in the St. Augustino - Streatham Lodge area but grown by peasants all over Trinidad. It is usually grown as an annual since it is severely attacked by wood-borers if treated as a perennial.

**Planting.** Five or six seeds are planted in rows 4 - 5 feet apart and with about the same distance between plants in the row. After germination, thinning to one or two strong seedlings per planting hole, takes place. The slow start made by pigeon peas and length of time required to establish a complete cover makes it possible to grow other crops already mentioned between the peas. Unlike cacao, a top dressing of sulphate of ammonia is not applied.

**Harvesting.** The pods are picked when full but still green and are sold in the pod @ 6c - 14c per lb. depending on market conditions. Picking is done mainly but not exclusively by women and children. If the price is not favourable the pods may be allowed to dry on the bush and are then shelled and utilized by boiling or making into "Dhal" (1).

"Homemode" using the rolling pin for a peaceful purpose.
Dry peas being further dried and threshed.

**Yield.** Picking continues from late December to April (January and February are the main months) and a variable quantity is consumed in the home. This makes it almost impossible to obtain accurate yield figures. A good average yield however, would be about 1,000 lbs./acre though the range is from 600 lbs. to 1,600 lbs./acre.

**Varieties.** Several originally distinct varieties of pigeon peas have become so mixed as to have lost their identity. There is a great opportunity for selection work better methods of seed storage. At present, empty drums are used as containers.

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**2. Okras**

Planted at the same time as pigeon peas and on the same land, preparation of the soil, weeding etc. are identical. Spacing of the taller bushy varieties is also the same as for peas. This type is later maturing but bears a heavier crop over a longer period and is favoured for wet season planting. A smaller, quicker-growing variety is grown on rice land at the end of the rice harvest and is discussed under the "Rice Rotation".

**Harvesting.** Carried out by all members of the household but principally by the women. Fruits are picked while the flesh is brittle before they become stringy. The plants are picked over every second day when the crop is at its best and less frequently as the crop falls off.

Okras are sold by number and not by weight, the price varying from 6c - 30c per 100 fruits. They are used boiled or baked as a green vegetable.

**Yield.** Accurate estimates are impossible owing to the longevity of the harvesting period and partial utilisation in the home. Late varieties probably yield 2,500 - 3,000 lbs./acre and early varieties 1,600 - 2,500 lbs./acre.

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(1) In the making of Dhal, dry peas are ground with a flat rotating stone turning on another flat basal stone. The ground material is winnowed in a breeze to remove the seed coat. Salt is added to the meal and then a mixture of hot cooking oil and Jim (corriwry = Cerum nigrum or C. ervi) is added. The mixture is then baked and is then termed Dhal.
4. *Eddoes*  
*Colocasia esculenta* syn. *C. antiquorum*

In the sugar cane mixture, eddoes may be planted in the row of pens or okras, or it may be planted in separate rows altogether. The former practice is the more usual, planting distances being much greater than if eddoes were planted alone.

The planting material consists of the daughter corms which spring up around the base of the mother corn. These also form the best-selling parts for eating purposes. A certain patch however is reserved for "seed" and is not harvested for sale but allowed to die back during the dry season. These shoot with the rains in May and are then lifted. The mother corn has decayed by this time by six or more cormels will have been produced. These "seed" usually come from a piece of garden not carrying sugar-cane since the cultivation required by this crop makes it necessary to harvest all the eddoes.

A hole 9 inches deep and 9 inches wide is filled with a mixture of soil and pan manure and the "seed" is planted in this a few inches below the surface. The spacing is 2 ft. by 2 ft.

Planted in May or June, the crop matures in about four months and is harvested from the middle of August to late September.

Yields are estimated at about 3 - 5 tons/acre.

5. *Corn*  
*Zea Mays.*

This crop is usually grown in the row of pigeon pens or eddoes.

About three seeds are planted two or three inches away from the pen seed or oddo bulbs which are planted at the same time in May or June. The corn shoots up rapidly and green cobs may be ready for picking after three to four months but the ripe dry corn will not be harvested until September or October. By this time the pigeon pens will have taken possession and are free from competition with other crops. Neither the corn nor the pens, nor the eddoes, okras or beans for that matter, are dressed with sulphate of ammonia during the wet season. Many gardeners have found that this leads to excessive vegetative growth without increasing yield but making picking more difficult.

Rough estimates of the corn yields are:

- Green cobs = 2,500 lbs./acre
- Dry cobs = 1,800-2,000 lbs./acre
- Dry grain = 1,400-1,600 lbs./acre

The most popular method of utilisation is picking green and boiling or roasting. Green cobs are usually sold at the rate of one cent/ob. Dry grain brings 3 - 5¢ per lb. at the local market.

6. *Salad Beans (French Beans)*  
*Phaseolus vulgaris*

Usually planted in the shallow furrows between rows of pigeon pens or okras or between rows of eddoes. A few seeds saved from the previous year's crop are poked into the ground and thinned out later if necessary.

Varieties are hopelessly mixed and require sorting out badly.

The fresh beans are sold at the local market and bring from 4-10¢ per lb. The usual price is about 8¢. A large quantity of beans is reserved for home use by Indian Families.
This crop is planted more or less haphazardly between the rows of other subsidiary crops. The vines spread over a considerable area another weeds and providing a vegetable which is both salable and popular in the home. The first crop is planted in May or June and harvested during late July or August. The hills and furrows are then made and cane is planted in the furrows. The other subsidiary crops are later removed, the banks broken down and another planting of cucumbers may be carried out between the rows of cane. This crop is planted in January and harvested in April and May.

In establishing a ground cover under young Sugar Cane, cucumbers & pumpkins are both used. In this case the crop is a type of pumpkin.

As indicated earlier in the outline of the cane-cropping system, sweet potatoes and tomatoes require special variations in the system evolved for the above crops. Tomatoes have already been discussed in the general outline where the position of sweet potatoes was also described briefly.

(See pág 49).

**Planting.**  Sweet potato "Slips" are planted on the top of banks which may run along or across the beds. Distance between slips 1 1⁄2 - 2 1⁄2 ft. and pan measure is mixed in around the base of the slip if available. "Slips" consist of the terminal portion of a stem and are 12 - 14 inches long carrying six nodes. If terminal shoots are not available, cuttings from lower down the stem may be used. The slips are sometimes obtained from gardens specially reserved for that purpose but the inevitable attack by insect pests makes it necessary to replant regularly to ensure a ready supply of planting material. Many of such plantings are quite unprofitable. September and October are the main planting months but another large scale planting takes place in May or June. Other intermittent plantings are mainly to provide slips. The crop from the early planting is harvested in October after which the banks may be cleaned up and planted with black eye cowpeas, bobi (yardlong bean) or other crops and cane will have been planted in the furrows in August or September. With the late planting in September, the land is banked and planting takes place as before except that cane is planted in the furrows at the same time.

**Treatment of Growing Crop.**  The trailing shoots which grow out tend to spread into the adjacent furrows, around the young cane plants, and take root. This secondary rooting is considered undesirable as it leads to a crop of many but small roots. Thus, periodically the shoots are turned back along the bank end are not permitted to root away from the mother root.

**Harvesting.**  Unlike the sweet potatoes observed in New Guinea, the crop flows profusely in Trinidad, though this is no indication of readiness for digging. This takes place when the lato cases to flow freely when the skin of the root is broken. Digging cannot be long delayed after they mature since the coast and give access to root-rotting organisms as well as a grub which does a lot of damage.

**Yield.**  It was possible to actually weigh the potatoes dug from a few small areas but this was confined to the dry season crop. Estimated yield is 1 1⁄2 tons per acre - an appallingly low figure. It would seem that yields of up to 5 tons / acre are not rare, especially for the wet season or June planting.
Varieties.
- Tokiela
- Chicken and Hen
- Janpadog
- Pumpkin schond Sili
  - Rod skin; white flesh and digitate leaves.
  - Rod skin; and partly digitate leaves.
  - As for Chicken and Hen.
  - Rod skin and yellow flesh.
  - Another red-skinned variety producing very round tubers which are white fleshed. The leaves are heart-shaped.

F(50)
Note pilo of slips

F(51)
Planting of Sweet Potatoes.
Note type hoo used for planting. Ordinary cutlass is often used.

F(52)
Planting of cacao between rows of Sweet Potatoes.

F(53)

N.B. OTHER CROPS sometimes grown with cacao are:

Cassava.
A few cuttings are sometimes planted along the edges of the drains between the long beds.

Pumpkins.
Which are sometimes planted in the same way as cucumbers.

Black Eye Pox. Which was nevertheless much more important in the rice rotation but is less important now owing to liability of disease.

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B. THE RICE ROTATIONS.

Since rice is grown on rather different soil types and has vastly different water requirements and a much shorter maturation period to sugar cane, it is not surprising that rice is associated with a different set of subsidiary crops; or where the same subsidiary crops are grown, that they receive different treatment. Crops grown on rice land which are not usually associated with sugar cane growing are: Coupans (black eye pea and gub gub), Woolly pyrol (Phaseolus mungo), Bodi (Yardlong bean - Vigna sesquipedalis), Egg-plant or melongons. Crops grown with sugar cane and also on rice land are: Okra, Savd beans, Tomatoes, Sweet potatoes, Cucumbers. These are grown in the actual rice "beys". Pigeon peas and sometimes tannins are grown on the banks or bunds.

Briefly this system of cultivation consists of a rice crop from June to December with the months of December to May filled in with crops mentioned above. The growing of subsidiary crops on rice land is often prevented by a great distance between the grower's home and his rice land. This invites "preadal lerecy" which is a big problem in Trinidad as a whole.

Whether or to what extent any one of the subsidiary crops mentioned will be grown depends on the likelihood of getting a good price for it. Except in the cases where woolly pyrol and coupans are grown, the sequence of crops is hazardous and not according to any rotational system.

**Examples of Crop Sequences (taken from actual gardens 1946:47)**

(a) Rice
Grass and wood fallow
Tomatoes and Cucumbers
Rice

(b) Rice
Okra
Rice
Okra
Rice

(c) Rice
Sweet potatoes
Rice
Okra
Rice
Tomatoes and beans

(d) Rice
Woolly pyrol
Rice
Woolly pyrol
Rice
etc.

(e) Rice
Grass and Wood fallow
Rice
Grass and Wood fallow
Rice
etc. (garden 2 miles from home)

The cultivation methods for these crops are as follows:

1. **Rice**

Background of Rice-cultivation in Trinidad.

Rice has been grown by the Indian population in Trinidad ever since the first indentures arrived. This was merely a continuation of a long unbroken tradition of rice culture by the Indians in India. It was just displaced by several thousand miles and implanted in Trinidad. The Indians leaning towards rice-growing was accepted by the estates which profited by giving families the use of small plots of land for this purpose, thus making conditions more attractive to labourers. Progress slow the early days has been slow and was discouraged by the estates which soon realised that rice as a crop, competed with the estates for labour at a vital time of the year. Besides this, was the fact that rice could be imported cheaply from outside (i). Both wars have resulted in sudden increases in the area devoted to rice when outside supplies have been cut off or greatly reduced. In 1896 the crop was about 6,000 acres. During the 1914-1918 war this figure rose to 10,000 acres. This figure did not fluctuate much.

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(1) Present annual production of swamp rice is about 13,000 tons (hill rice 2,000 tons). Imports of rice from British Guiana in 1946 was about 11,000 tons. i.e. Trinidad is about 50% self-supporting in rice requirements.
until the last war when the area became expanded to about 20,000 acres (i).
Trends shown by these figures apply specifically to the survey area as well as to Trinidad as a whole.

Importance of peasant-grown rice.
Rice forms the staple food for the Indians as well as for the West Indians (Negroes). The rice is produced entirely by Indians who regard the crop as an insurance against failure in other crops or general food shortage. Little is sold, sufficient being milled every few weeks to last for an equivalent period. Indians try to be self-supporting so far as rice is concerned and most of them probably succeed except in dry years.
Av. rice consumption = 370 lbs/consumer equivalent (ii)/annum.
Av. rice consumption/household = 4.15
Av. annual rice requirement/household = 1530 lbs = 2550 lbs padi (iii).
Av. yield padi = 2500 lbs/acre
Area required for self-sufficiency = 1 acre
Av. area rice land per household = 1 acre (approx.)

Thus many rice growers have a small surplus each year which is either carried forward or sold in small amounts when the grower needs some cash. Black market prices were extremely attractive during the war-time shortage. In the dry years, when the yields sometimes fall as low as 1200 lbs. padi/acre, those who saved previous surpluses are able to last the distance but others are forced to buy rice until the next harvest.

For almost all peasants rice is a major crop since it constitutes about one third of the value of all food consumed.
Total food expenditure = $34.09/consumer equivalent/annum. (average)
Value of rice consumed = $5.00/ " " / " (average)
Some peasants on irrigated land produce rice for sale and depend on this source of income for the bulk of their income. For cane-farmers and provisions gardeners, rice is the most important subsidiary but is grown on separate land.

Methods of Rice cultivation in St. Augustine-Streatham Lodge Area.

All the rice grown is swamp rice. Differences in methods are variations on the same general theme. A typical rice "bay" is shown by the following photographs.

P(54) Old established fields, Freshly ploughed but un-harrowed.

P(55) Newly constructed rice "bays". Banks are about 3 ft. wide at the base, 2-3½ ft. high and 1 ft. wide at the top. New bays are not commonly seen - built during dry season.

(i) About 15,000 acres swamp rice and about 4½ thousand acres hill rice.
(ii) From Dr. A. L. Jolly's "Peasant Farming in Bejucal area of Trinidad"
Consumer equivalents were: 1 senile = 0.50 C.E., 1 adult male = 1.00 C.E., 1 adult female = 0.75, 1 male youth = 0.75, 1 female youth = 0.75, 1 school child = 0.50, 1 child = 0.35, 1 infant = 0.25.
Since many of the St. Augustine Indians actually constitute the rice growers in Bejucal, the figures are probably quite applicable in the St. Augustine area.

(iii) Tarmed padi before husks removed and rice afterwards. Husks account for about 25% of the weight of padi.
Preparation of Land.

Heavy weed growth due to higher rainfall in May is cutlassed, stacked in heaps and burnt when dry. This growth is usually too muddy to feed to stock - is allowed to rot on the bunds if weather too wet for burning. This is done in late May or June.

Grass is cut and stacked in heaps ready for burning when dry.

The land is then ploughed or forked.

When ploughed, a single furrow mouldboard drawn by a pair of oxen is used. This may be the property of the rice farmer or of one of a number of ploughmen who do the work on a contractual basis at the rate of $14.00/acre. Forking takes much longer and is more laborious but many growers feel that it does a better job. After ploughing, harrowing is also necessary and ploughmen usually does this at the same time at $4.00/acre. Otherwise the land is hand-hoed.

Harrow - built by peasant clogs easily. Could be improved by having iron pegs a little longer.

After these operations, the banks and drains are cleaned up in readiness for planting, as shown by photographs:

Cleaning Supply-ehammel.

This strip of Rice was dug in Caneland showing the extent to which cane is "going-cut".
The peasants aim to just have this cultivation finished by the time the rice is ready to transplant. Ploughing is often delayed until the land is covered with water and only oxen are capable of supplying the draught requirements. In this condition, ploughing is often omitted and only a rough hand hoeing and treading is given.

A very interesting development during May and June 1948 consisted of the use of a rotary hoe by the Department of Agriculture in preparing their rice land in this area for the crop. The Indians were quick to recognize the virtues of its performance and on the advice of Mr. D. Murray (Economic Botanist-Trinidad Department of Agriculture), banded together and hired a rotary hoe from machinery agents - H. E. Robinson, Ltd. This is just one of the many indications that these farmers are receptive of new ideas which they are anxious to try.

Planting. Several methods of planting are used, vixi-

(1) Transplanting from a Nursery.

This is by far the most popular and successful method of establishing rice in this area. Nursery may be established near the grower's home or in one corner of the field which is to carry the crop. For the nursery the land is forked by hand and hood into a fine tilth. Very fine pen manure is then scattered over the surface and the padi is then broadcast when the ground becomes wet enough. In the nursery the seedling rate is 70-120 lbs. of padi per 1-1½ sq. chains (depending on the variety and the state of the grain) and this will provide sufficient plants for one acre or more. This rate appears to be excessive but bad seed is not separated out and losses by birds are considerable. Moreover, the thick planting renders weeding unnecessary in the nursery. Coconut leaves are sometimes placed over the seed until it has sprouted as a protection from birds.

The seedlings remain in the nursery for 28-35 days and sometimes longer if the nursery is in a dry situation.

Coconut leaves over nursery to protect from bird damage. Two small nurseries, one planted a week or so after the other. This is common when the area to be planted is large.

Meanwhile the riceland has been prepared as already described. The seedlings are pulled up and tied in bundles about three inches in diameter and the roots are washed clean. The Indians say that the cleaner the washing the quicker the seedlings "take". Pulling of seedlings take place when they are 12-18 inches high but over 14 inches high 2-3 inches of the tops are screwed off and fed to stock. The seedlings may be planted out immediately or left overnight and then planted out.

Transplanting is usually done by women who are more efficient and cheaper labour than men. Two or three vigorous seedlings or four to five spindly seedlings are pressed into the ground about 8-9 inches apart, the land at the time having a variable coverage of water. The grower likes to have the operation completed in one day and will hire a gang just large enough to do this. One acre would require a gang of 10 women for one day for transplanting.

If the ground is hard or rather dry, the hole may be made with a sharpened stick but more often the grower will wait for rain and obtain good seedlings elsewhere and carry out the planting normally.

Left Pulling up seedlings.

Right Stacking bundles ready to transport to field for Planting.
(2) Broadcasting.
This is another method of establishing rice which is not very popular but used when the wet season is delayed. To avoid the labor of transplanting the young rice plants, the rice is broadcast over the field and allowed to sprout and grow. The growing period is thereby shortened.

The land is prepared as for the transplanting method and the padi scattered over the surface at a rate varying from 90-150 lbs/acre. The rate is governed by prevalence of birds, crabs (which destroy young plants) and whether it is a weedy field or not. Subsequent thinning in dense patches and transplanting to sparse areas is usually necessary.

(3) Dibbling.
Instead of broadcasting, when the rains are late, or sometimes even if the rains are on time, a method of dibbling the seed is used. For best results the land is ploughed or forked during the dry season usually in March or April. The land is heaped up over the plantings which can be carried out early i.e., in late May or early June. Small holes are made with a pointed stick about 12 inches apart and 5-6 seeds dropped in and covered with the planters toes. The wide spacing permits thorough hoe-weeding which is not possible with broadcasting. Loss by birds is reduced and less seed is required. Rate of sowing is 60-90 lbs/acre.

Thus the plants are sturdy, well-rooted and free of weeds when the wet season sets in and get away to a flying start. Yields are said to be equal to, and often better than yields from transplanted rice. The reasons why this method is not more widely used are that more time and effort is necessary and the work required clashes with the high labor requirements of the sugar estates owing to the cane-cutting season. Transplanted rice can be dealt with when the sugar-cutting and grinding have all been finished for the year.

N.B. Another method of rice planting was described by some growers (but not observed by writer) and is said to be used occasionally. It consists of transplanting larger seedlings into deeper water using a stick which has an eye on one end. The eye is placed over the roots of a few seedlings carried in a bundle and are then pushed into the ground with the stick, firmly in with the toe and the eye is slipped up the stem and freed.

Management of Growing Crop

Water Control
In all the methods of planting and during subsequent growth, the rice crop suffers from lack of proper water control. The peasants cannot regulate the frequency of showers, rate of precipitation or the length of time for which rain falls. This makes rice production a matter of luck as well as skill. Providing that flooding does not occur, the grower, by manipulation of openings in his bunds and block in the channels, can regulate the amount of water which gets onto his ricefields. Similarly, he can to some extent regulate the amount of water which is allowed to drain away from his fields although complications arise when the rice bay has no direct connection with a drain. When one grower drains his water onto another man's rice there is trouble brewing. If the weather is dry, the extent of the peasants' control of water is quickly seen.
The rice-growers like to have a depth of about 3 inches of water when they transplant to the fields, but planting will be carried out up to a depth of 5 inches or thereabouts. If the depth exceeds six inches, then nursery seedlings are often discarded in favour of self-sown rice plants. At the spot where threshing took place in the previous year, a thick crop of rice will sprout up with the first rains, too early to be of any use. They are usually well grown by the time the rice fields are ready for planting and will be several weeks ahead of nursery sown rice. This makes them useful when the water on the ricefields suddenly becomes too deep for nursery seedlings.

Self-sown seedlings are of extremely mixed quality and maturity and this leads in to difficulties at harvesting time.

After planting the growers aim at raising the water level as the crop matures to a depth of about 12 inches. Such a result however, is seldom obtained except in low-lying areas where the problem is not to get water but to get rid of it. On higher areas, too much water will often be retained rather than let it run to waste and risk the onset of a dry spell. The water level is often too low during the later months of growth and may dry off partially before the grain is "full". This results in "white-bellied" grain. If the late water supply is good, the water is drained off when the grain is in the "doughy" stage.

In the irrigated area, rice-growing is less hazardous since good water control is possible by virtue of the properly surveyed and laid out system of supply channels and drains.

Weeding. Thorough weeding is regarded as essential. One, and usually only one hand weeding is carried out 4-6 weeks after transplanting depending on weed growth. The bunds are included in this weeding. One acre usually requires 10 people for one day, or the equivalent thereof, to weed it properly. The trampling the land receives incidentally to weeding (as well as ploughing, levelling and planting) is regarded as being beneficial.

Harvesting Operations.

Cutting. Stems are cut 2-3 inches above ground level with a sickle when the grain has hardened but before shedding has become likely. The bundles of stems are then stacked up in piles near the beating frame in readiness for threshing.

Beating. A large sheet of hessian or opened up bags sown together is spread under and around the bamboo beating table. Several men thrash the heads against the table, the padi falling through onto the hessian. Stalks are used as a mulch over the rice-land for the following dry-season crops.

Winnowing and Bagging.

Winnowing is done by shaking the grain slowly from a pan from a height of 6 ft, while a light breeze is blowing. The good grain is then scooped into bags which are loaded onto a cart for transport to the home. The whole family is involved.
The labour requirements of these operations varies with the skill of the workers and the yield of the crop. For 1 acre - 10 men for one day to cut and stack. 6 men " " " to beat, winnow and bag.

Yield.
Without irrigation, padi yields fluctuate considerably. The range is from 8-20 barrels (i) or 1,200-3,200 lbs. padi/acre. A good average yield for the area is 2,500 lbs. padi/acre (ii). Where irrigation water is available, the yields of padi may go higher than 5,000 lbs./acre and the growers count on getting about 4,500 lbs. (iii).

Ratoon Crop.
Sometimes after harvest the short stubble shoots and produces another crop of rice in April or March. The yield is very poor (2-4 barrels/acre) and diseases are prevalent. The yield hardly justifies the effort involved in cutting and beating etc.

Dry Season Crop.
On the irrigated area of which I. C. T. A. has about 3 acres and the Department of Agriculture - 8 acres, experiments have been carried out with the possibility of growing two crops of rice during the year. Successful crops have been grown during the dry season and several Indians observing this, tried it for themselves with varying success. It would appear that with proper selection of variety, a second crop could be grown. Once again too, the Indians willingness to try novel ideas is displayed. A second crop is impossible without irrigation.

Irrigation in the St. Augustine Area.
A scheme began in the middle of 1946 by the Department of Hydraulics, whereby 217 acres would be irrigated from the Tacarigua River (iv). Cost of the scheme in the first year was $8,000.00. In 1947, the area was increased to 241 acres. Cost of maintaining irrigation channels and drains is $2,000.00/annum, but in spite of this the growers pay nothing for their water. It is later intended to double the area irrigated by taking in a considerable area of Stretshaw Lodge rice land. This involves the construction of another dam on the Tacarigua River and utilisation of the Tunapuna River.

It will ultimately be necessary for the growers to partly defray the cost of the system or at least to pay the maintenance costs. This should have been insisted on from the word go but has been allowed to slide. The undoubted reality of Indians' tendency to expect the Government to hand-feed them will make it difficult to retrieve this error.

(i) It is usual to speak about yields etc. in terms of barrels. One barrel = 160 lbs. and is equivalent to 2 bags.
(ii) Equivalent to 3,500 lbs. milled rice approximately.
(iii) Equivalent to 2,700 lbs. milled rice approximately.
(iv) An extension of a scheme already operating in the Bejucal area. Latter is on a larger scale e.g. 1,700 acres irrigated in 1947. Here the rice growing is on a firmer footing for unlike the St. Augustine growers, the Bejucal people are not concerned with innumerable activities away from the rice land.
One important and immediate effect has been that both I.C.T.A., and The Trinidad Department of Agriculture have been able to start experiments with swamp rice. Such experiments include: Planting date, varietal trials, manurial trials, different methods of planting, use of mechanical tillage implements etc., spacing trials and selection work.

Utilisation of Rice.

After being taken home, the rice is spread out in the sun on hessian or bags to dry. It is turned during the day by walking over it and smoothing with the hands.

Three days good hot sun is sufficient drying after which the rice is bagged or tipped into an empty drum for storage. Every 3-4 weeks sufficient is sun-dried before milling, to last for an equivalent period. There are three private owners of rice mills in the district. They charge 6c/pan for milling. (1 pan = 30 lbs.)

The rice boiled plain or mixed with various flavourings such as curry, masala etc. One interesting treatment is to bake the padi until the husks become brown and then to pound it in a mortar with a pestle. This removes the husk which is winnowed off and the grain is left in a condition something like rolled oats.

Wooden mortar with pestle lying behind the Indian’s leg. The pan is used for winnowing. This treatment of rice is best done with fresh padi. It is eaten with milk and sugar with or without boiling.

Varieties of Rice.

See Appendix D.
Economics of Rice Production.

As a crop, rice requires a greater input of more strenuous labour than cane or provisions, and within narrow and strict time limits. From an economist's point of view, rice growing in the survey area is not a worthwhile proposition. That is, if the family's labour is evaluated at current rates and taken into account in production costs. Since the grower would have difficulty in obtaining outside employment and since he regards his work as in no way connected with wage-earning, this would hardly seem justified; but assuming that all operations in rice-cultivation were carried out with hired labour, the cost of producing a one-acre crop of rice would be roughly as follows:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Labour Required @ Current Rates</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outleasing of grass and weeds</td>
<td>9-10 men for one day @ $2.00/day</td>
<td>$18.00</td>
</tr>
<tr>
<td>Cleaning and repairing bunds</td>
<td>6 &quot; &quot;  &quot;  &quot;  &quot;  $2.00/day</td>
<td>12.00</td>
</tr>
<tr>
<td>Ploughing or Forking</td>
<td>1 acre @ $14.00/acre</td>
<td>14.00</td>
</tr>
<tr>
<td>Levelling or Harrowing</td>
<td>1 acre @ $ 4.00/acre</td>
<td>4.00</td>
</tr>
<tr>
<td>Pulling and tilling of seedlings</td>
<td>2 men for one day @ $2.00/day</td>
<td>4.00</td>
</tr>
<tr>
<td>Planting</td>
<td>10 women for one day @ $1.00/day</td>
<td>10.00</td>
</tr>
<tr>
<td>Wooding</td>
<td>6 men for one day @ $2.00/day</td>
<td>12.00</td>
</tr>
<tr>
<td>Cutting and Stacking</td>
<td>10 &quot; &quot;  &quot;  &quot;  &quot;  $2.00/day</td>
<td>20.00</td>
</tr>
<tr>
<td>Beating, winnowing and bagging</td>
<td>6 &quot; &quot;  &quot;  &quot;  &quot;  @ $2.00/day</td>
<td>16.00</td>
</tr>
<tr>
<td>Transport to home</td>
<td>(Assuming a distance of 1 mile)</td>
<td>4.00</td>
</tr>
<tr>
<td>Rent on Land</td>
<td>@ Strathaird Lodge rates</td>
<td>10.00</td>
</tr>
<tr>
<td>Milling</td>
<td>@ 6c for 30 lbs. (iii)</td>
<td>5.00</td>
</tr>
</tbody>
</table>

No. of man days involved = 66 $129.00

The total cost arrived at does not include depreciation in tools and equipment, labour involved in regulating drainage of the rice, labour involved in drying and milling of rice or the cost of seed and manure.

Yield of padi = 2,500 lbs./acre = 1,800 lbs. milled rice.

Schedule price milled rice = 76c/pound.

Value of crop = $126.00 (i.e. in the economic sense only).

Cost of production = $129.00 (conservative estimate)

These figures invite the question: "Why is rice grown at all?" and the answer is that especially during the war years, rice has not been available for purchase. Other reasons are given below.

Dr. Jolly found in Bajulat that labour costs, excluding family labour, accounted for 83% of the cost of production of rice; further, that net income per man day decreased as the expenditure on hired labour increased.

This invites another question: "Why the high expenditure on hired labour if it is unprofitable?" and there are three reasons for this:

(a) Some operations require skilled labour which often cannot be supplied by the family in sufficient quantity e.g. planting and ploughing.
(b) It is necessary to have some operations completed in one or two days to take advantage of weather conditions or to make for uniformity in the crop e.g. planting, cutting and beating.
(c) The Indians regard their rice crop as an insurance against failure in other crops or general food shortage. His feeling of security depends on whether or not he has rice or several barrels in his home. This is used as a sort of bank for the owner can obtain the cash value of small amounts if he so desires. Thus a loss on labour input will be suffered to reduce the possibility of total failure in the rice crop.

(i) Allowing 12 man days for these operations.
(ii) Women are more efficient than men so 1 woman day is at least equivalent if not greater than 1 man day, for this operation.
(iii) Assuming a yield of 2,500 lbs. padi.
2. Okras

The growing of okras in the sugar cane mixture has already been discussed. In the rice mixture, the land is drained before the rice harvest after which it is forked and ploughed in readiness for the dry season crop. Very often however, the seeds may be planted, ring-weeded after germination and later hoed without first ploughing.

Okras are grown as a monoculture on riceland and not in a mixture such as when grown with cane. Seeds are planted in December or January at a spacing of 1-2 ft. The early variety "Six-weeks okra" is the most popular. Picking takes place in March, April and May.

A dressing of sulphate of ammonia is given when the plants are 1/2-1 ft. high.

3. Tomatoes

Seeds are planted in seedbeds in December or January and transplanted into rows 3 ft. apart with 1-11/2 ft. between plants in the row. The rows are hilled up with successive weedicings and a dressing of sulphate of ammonia may be applied. Harvesting takes place in April and May. Many different varieties are available.

The yield is about 2,000 lbs/acre. Recently, higher prices have been offered for higher quality fruits. Lack of a premium has hindered production of high quality fruits, but prices of 12c, 16c and 20c are now being paid for small, medium and large sized fruits. This discrimination may not last.

Tomato seed bed shaded by pigeon peas.

4. Salad Beans (French Beans)

This crop is rarely seen growing on a large scale and small patches only are seen growing on riceland. Beans are primarily a wet and not a dry season crop.
5. Sweet Potatoes

Being low-lying, the ricefield is the only place where there is sufficient moisture for a crop of sweet potatoes planted as late as December or January. After the rice harvest in November, rows of banks are constructed as per photograph. Slips are planted along the banks. Rain water is trapped in the furrows and this prevents the soil from drying out between showers.

Water trapped between banks of sweet potatoes.

Harvesting, by hand-digging is carried out in May. The vines are fed to stock. The yield is rather poor.

6. Cucumbers

The ricefield is ploughed or forked and 5-6 seeds planted in holes containing cow manure. Spacing is about 6 ft. and after germination, thinning to one or two sturdy seedlings takes place. This planting is carried out in December, January and even into February. Harvesting takes place in April and May.

7. Pigeon Peas

These are not planted in the rice-fields proper but on the bunds surrounding the fields. Tannias are sometimes grown in the same way. The peas when planted in this way are treated as perennials and are cut back to a height of 6 inches every year and allowed to shoot up again the following season. They serve partly as a windbreak and to bind the bunds as well as providing a useful food.

These pigeon peas are in their second year's growth. Note that many are falling over at ground owing to the attack of a stem borer.

8. Black-eye Peas (Cowpeas)

The growing of the correct varieties of cowpeas was once a very popular rotation with rice but has gone out almost completely owing to the susceptibility of the crop to insect pests but more particularly a virus mosaic. Cowpeas were grown in much the same way as woolly pyrol is grown now.
The black seeds are broadcast fairly thickly over the rice field after the harvesting of the rice. No preparation of the land is the general rule. Sometimes the young plants are ring-woofed with a hoe but thereafter the crop receives no attention until harvesting. Harvesting takes place in April or May when the pods are dry but before they are shatterred. The plants are uprooted and are taken home when they are beaten with sticks. The residue of earth and pulp is placed in water to remove the dirt and is then sun-dried. The crop yields 400-500 lbs/acre of dry grain. It is a useful crop by virtue of its hardiness, drought-resistance, early maturity and yield of protein-rich food. It is also popular because unlike tomatoes or egg-plants, the fruits are not vulnerable to theft.

Woolly pyrol is thus grown on distant rice fields which would otherwise just carry weeds. It is utilised by drying, grinding and sifting for the making of bakes, or it is used as split peas. A fair quantity is boiled and fed to stock.

**10. Egg Plant or Molongon**

The land is prepared as for tomatoes and general treatment of the crop is similar. Seedlings are planted with a handful of manure 2 ft. apart and watered from a well if possible. Planted in December or January, harvesting takes place during April and May.

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**C. PROVISIONS GARDENING**

The development of provisions gardening has gone ahead as the number of canefarmers has decreased. (See section on Sugar Cane). The reasons for this have already been considered.

Of the three systems of agriculture mentioned so far, provisions gardening and cane farming are about equally profitable (i) and rice is the least profitable. Dr. Jolly's conclusion that the labour requirements of provisions crops is intermediate between cane (relatively low) and rice (very high) applies with equal force in the survey area as well as in Bojucal. The labour involved in provisions gardening is spread out more through the year than in the case of cane or rice.

**Crops involved and their Management.**

Crops described so far in connection with cane and rice production are: Sweet potato, Pigeon Peas, Okra, Eddoes, Corn, Cucumbers, Salad Beans, Tomatoes, Cabbage, Woolly Pyrol and Egg plant. All these except woolly pyrol are also grown in provisions gardens independently of both cane and rice, and are therefore common to all three systems of agriculture. When grown with cane, the methods of cultivation are modified to suit the particular requirements of cane. When grown in the rice fields the methods are altered to suit low-lying of ten poorly drained rice land. However, when grown in provisions gardens the treatment of these food crops is more in accordance with their own particular requirements. This often means that the crop is grown on its own instead of in a mixture. Sometimes it means that the crop receives more manure, more weeding.

(1) During the war, when prices of food crops were very high, Dr. A. L. Jolly found that provisions gardening was more profitable than cane farming in the Bojucal area. Since then food prices have fallen and sugar prices have risen. The fact that the Strawhall Lodge canefarmers are not reducing their plantings of cane significantly, supports the view that there is now, not much difference between the profitability of cane and provisions.
and closer attention in general; but very often the crop performs equally well or better in semi-mixtures or on rice land, then it does when grown away from them, e.g. the presence of cane in the furrows between rows of sweet potatoes in no way affects the yield. The dry season crops grown on rice land are usually superior to the same crops grown at the same time on the long cambered beds which is the basis for provisions as well as conservation. The latter often become bone dry during the dry season whereas the rice land remains moist.

Besides these crops which are involved in all systems many are grown only in provisions gardens. These are:

<table>
<thead>
<tr>
<th>Yam</th>
<th>Cabbage</th>
<th>bodi (yr-long bean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tannier</td>
<td>Lettuce</td>
<td>Ginger</td>
</tr>
<tr>
<td>Cassava</td>
<td>Peppers</td>
<td>topoce-tambou (very little)</td>
</tr>
<tr>
<td>Dashon</td>
<td>Radishes</td>
<td></td>
</tr>
</tbody>
</table>

Of all the crops grown, eddoes, yams and pigeon peas are the most important.

Rotations. As on the rice lands, planned rotations are non-existent. Falls are given sometimes by accident rather than design though their beneficial results are appreciated. A long fallow of 2 years is sometimes given when the land has been "flogged to death" and no longer capable of producing crops.

Sequences which have been obtained for random gardens are as follows:

(1) **Eddoes** October-September

**Melongon** October-January

**Bodi** December-April

(2) **Tannier**, **Beans & corn** May-December

**Long fallow** 2 years

**Eddoes** May-October

**Bodi** November-December

**Short fallow** April-May

(3) **Bodi** Melongon

**Lettuce** Yams

**Bodi** Tomatoes

**Lettuce** Pigeon Peas and Ginger

**Beans** Bodi

**Bodi** Yams

(4) **Melongon**

Eddoes, Beans and Corn

Fallow (4 months)

(5) **Melongon**

Tomatoes

Melongon

Sweet Potatoes.

Yams are grown chiefly as a cash crop but those damaged during harvesting are often used in the home. A well-drained situation is prepared and the inescapable cambered beds are probably quite suitable for yams.

A general cultivation of the planting area is not given. Grass and weeds are brushed with a cutlass and used for food or bedding in the cattle pens.

**Cleaning a bed preparatory to yam planting.**

**Same for other food crops.**

**Yam planting preparation at I.C.T.A. suggests the origin of the method used by neighbouring peasant farmers.** P(85)

The short stubble is then hood and furrows about 1 ft. wide and 1 ft. deep are dug. These are 3-4 ft. apart and run across the beds. Dry grass, cane trash etc. are piled up high in the furrows and allowed to settle for a few days.

**Barely brought in readiness for planting yams growing in a mixture with corn - behind.**

**The same yams staked a few days later P(87)**
Pen manure is applied on the top of the trash in great quantities so that the furrow is almost completely filled. Sometimes, rather than dig a long furrow, the farmers dig individual planting holes 1 ft. x 1 ft. x 1 ft. and these are manured in the same way.

Pen manure destined for the yam garden.

Planting. The yams retained for "seed" are stored in a cool dry place after harvesting but begin to sprout in May. These are usually cut into pieces of 3-4 oz. and these are placed with the skin downwards in the manure in the furrow. They are spaced at 2-2½ ft. and are covered over with about 3 inches of fine soil. The actual seeding rate is 1,000-1,400 lbs/acre i.e. cost of seed alone is $30.00-$40.00/acre. Planting takes place in late May or June.

After about a month when the shoots have all come through, a thorough weeding is given and then the yams are staked with bamboo sticks with lateral branches left in one plane only. The vines form a dense canopy over these brambles.

Yams allowed to climb on bamboo brambles.

Digging. This takes place in January or February or sometimes into March of the year following planting. The vines have at this stage died back partially or completely. The soil is loosened around the main stem with a cutlass or small hoe and the yams are lifted out.

Yield. Yields on the whole are poor the average being about 5 tons/acre although some go up to 10 tons.

Weighing the yams from a small plot during course of survey.
Varieties. The relatively high yielding white fleshed Lisbon yam is the most popular to grow for market but for home consumption, the cush-cush yam is preferred for its flavour.

Pumpkins are sometimes grown with the yams and also, a few cassava cuttings are very commonly put in at the end of the rows.

2. Tannias (1)  Xanthosoma sagittifolium  (syn. Alocasia indica)

This crop is not grown on a large scale but is grown in small lots for home consumption. It is very often grown in a mixture of corn and beans or corn and eddoes. Planting holes 1 ft. x 1 ft. x 1 ft. are dug and manured in the same way as yams. Either sections of the main root, or daughter bulbs are planted in this hole, a shallow depression being left around the actual site. Planting in May or June.

Sometimes the plants are uprooted after 10 months one picking only being obtained, or more often the plant is castrated after 6-7 months by digging down beside the main root, removing the daughter bulbs and killing up again. This is followed by another harvest 4-5 months later when the plant is uprooted. The mother root and some daughter bulbs may be replanted again immediately. A crop is never left for more than twelve months because it cannot withstand the dry season.

3. Dasheen  Colocasia sp.

Dasheens, like tannias are not widely grown for the stated reason that the soil is not good enough. Where grown it is usually with the idea of both home use and sale.

Preparation of planting holes is the same as for tannias but the planting material consists of the pseudo-stem with a few nodes from the top of the corn attached. (N.B. These are not used in propagation of eddoes). The suckers around the mother plant can also be used. Spacing is 2 ft. x 2 ft. Growing period is 6-8 months. The leaves are used as a flavouring. Eddo leaves are not eaten.

P (92)  A young crop of Eddoes.

A mixture of Eddoes, Corn & Dasheen.  P (93)

4. Pumpkins  (Cucurbita maxima) & Cucumbers  (Cucumis sp.)

Often grown by accident but nevertheless utilised by consumption or sale. Often grow around old mature heaps and on uncropped pieces of land. When sown they are usually mixed with tannias, corn, cassava or yams.

P (94)  A young crop of Cucumbers.

The same crop 2 months later i.e. Cucumbers used to keep weeds down while pigeon peas become established.

P (95)

(1) Tannias are known as "Taro Kong-Kong" in New Guinea. "Taro" covers both Eddoes and Dasheen. The letter is a larger variety with a pigmented spot where the petiole joins the leaf. Eddoes are smaller and early maturing. Leaves are peltate in both cases.
Cucurbita moschata (like an attenuated pumpkin) and rarely Sechium edule (choko) as well as cucumbers are other cucurbits which are grown. Of all these cucumbers is the most popular crop.

5. Cassava

Manihot utilissima

In a mixed garden on a long bed, it is very common to see cassava grown on the sides of the bed. It is also commonly grown with yams. Only sweet cassava is grown.

Cuttings are taken preferably from the most mature part of the plant. Pieces 10-14 inches long are planted nearly horizontally a few inches deep with one end protruding 4-5 inches. This takes place in May or June and harvesting follows in February or March of the following year. Pen manure is not applied. Yields are extremely variable.

6. Melongena

Solanum melongena

Grown on rice land but planted in March, April or May. It may bear two or three crops before being pulled out in May of the following year of before.

This young crop of melongens shows clearly the sort of garden beds used in provisions gardening.

Melongens on peasant holding at I.C.T.A. Several crops are obtained especially if irrigation water is available as in this case.
7. Bodi or Yard-long Bean

This is a very popular crop because it can be sold at a fairly high price and in addition it is used extensively in the homes. Three or four seeds are planted 1 ft. apart in rows 2½ ft. apart and later, thinning takes place leaving one or two plants. After three or four weeks, a weeding is given, the plants being slightly hilled and bamboo sticks are pushed in.

The plants climb over
the brambles and form
a heavy canopy.

The first picking is obtained in 3 months. Two crops can be grown in a year: one planted in June and harvested in October-November, and the other planted in November-December and harvested in March or April.

8. Peppers (Chillis) Capsicum ann.

Both hot and sweet peppers are grown extensively but there is a better market for the latter. Hot peppers usually sell at about 10¢/100 whereas sweet peppers often bring 21¢/100; fruits.

Seedlings are transplanted from nurseries into the freshly forked garden and are spaced at 2½ x 3 ft. If available, the seedlings are watered with dilute urine. Planting is carried out in June or December and the fruits are picked as they ripen. If planted during December month, better prices are obtained at the harvest in April but the plants require hand watering from wells during dry spells.

A good crop of sweet peppers.

The plant is a true perennial and may be left for a few years but usually no more than two crops and often only one is taken before the plants are pulled out. Seed for the next crop is obtained by splitting the ripe fruits and sun-drying the seeds. The fruits are stored by drying without cutting and are used as a flavouring in many dishes.

9. Cabbages, Lettuce and Radishes

These are grown in ordinary ways. Each is grown as a monoculture and of the three, the cabbage crop is the most important. All are grown both for market and home use though none is retained if the price offered is high.

Cabbages cannot be grown during the wet season and are planted from September on to December. Lettuce and radishes can be planted anytime if hand watering can be carried out during the dry months.
Hand-watering cabbages planted in January from a nearby well.

These may be out in the open or shaded.

During the wet season, soil may be placed on a bamboo table to ensure good drainage. The seeds are then planted in the fine soil on the table.

Carrots and Beetroot are grown occasionally in similar ways.

D. HOUSEHOLD GARDENING

Household gardens contain perennials, for which the grower is not prepared to make space in his gardens available, condiments, flavourings and spices, plants of medicinal value and ornamental plants. There is no definite system in this type of cultivation, plants being poked into odd corners as the opportunity presents itself. Everything grown in this way is entirely for home use although any surpluses may be sold or given away.

Fruit Trees

These have been summarised already—see Part 3, Section 3.

Mango, Coconuts, Malay Apple or Pomerac, Hog plum, Golden plum, Chenet, Star apple, Sapodilla, Soursop, Guava, Avocado pear, Cashew nut, Breadfruit and Chataigne, Citrus spp., Papaws and Bananas.

Any one person usually has about six of these.

Perennial Food Plants

Wabi Bean. Grown on a large frame or trellis 6-8 ft. high. Used as a green vegetable (Dolichos lab-lab).
Perennial Food Plants

Poi Spinach - Basella indica
Also grown on a small bamboo frame about 3 ft. above ground level. Not very common as it suffers from eel-worm attack of the roots very severely. The shoots and leaves are boiled.

Lime Bean Usually found growing along a fence. Dies back during the dry season but sprouts again in the wet. Several varieties are grown - all for the pulse.

Annual Food Plants

Groundnuts A few clumps are often seen growing haphazardly.

Toppee-tambou A root crop which can usually be found growing in isolated clumps around the house.

Bhagi (Amaranthus tristis) and Patchoi These are grown on a small scale and used as spinaches.

Condiments and Flavourings see Appendix
Caryla or Caryli, Jhingi, Ginger, Shallots, Roselle, and Turmeric are grown in small patches or as isolated plants in the kitchen gardens. Trees falling in this class are: Seijun (Moringa oleifera) and Tamarind (Tamarindus indica).

Miscellaneous group including Ornamentals
Calabash, cotton, Castor oil Plant, Hibiscus, Glyricidia, Dracaena and croton are all common around the home.

Although these gardens produce less compared with other gardens, they are nevertheless quite important. It is the nature of the products of these gardens which gives the food its peculiar Indian flavour and this is a big thing so far as they, the Indians are concerned. Furthermore, even though the amounts may be small, it is likely that these gardens supply many minerals and vitamins. Finally, having his home surrounded by a garden in which the family can potter around has a big effect on the children who grow up in the atmosphere of gardening.

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IMPORTANT NOTE

Four systems of agriculture have been described. They are by no means independent of each other and any one peasant will indulge to some extent in at least three or perhaps all of them.

**********************
Livestock in the survey area provide draught power, meat, milk, eggs and last but not least, manure. With the root crops particularly, the Indians clearly recognise the fact that yields vary directly with the amount of pen manure applied.

Cane-farmers also realise the value of pen manure when applied to cane.

**Cattle**

Considering their limited resources, the management of cattle by the Indians is, on the whole pretty good. The Mahomedans and Madrasi probably follow the Hindus whose religion demands respectful treatment; but there are plenty of exceptions to this among all Indians.

The **Pure Holstein Friesians** are popular for milk production - more popular in fact, than their performance justifies, for this breed has undoubtedly degenerated under tropical conditions. As found at the Government Stock Farm, a part Holstein part Zebu animal gives best results. The local cattle mostly show evidence of Zebu, Holstein, a little Jersey and a more noticeable admixture of Shorthorn blood in their ancestry.

A high class Holstein-Friesian Bull used for stud and not draught purposes.

Very high withers, a small hump, a heavy dewlap and drooping ears indicate Zebu blood. There is no planned breeding and the Indians try to make all heifers into milkers and all bulls into draught animals.

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(1) Deadstock consists of carts, bicycles, hoes, forks and other agricultural implements. One family in two or three has a cart and one in five or six a bicycle. A pair of cartwheels cost $110-120.0 and this prevents much increase in the use of carts. A good one cannot be purchased for less than $150.00.
A bull of very mixed origin and quite unthrifty. It was sick when photograph was taken. Had been used as a draught animal.

Service facilities provided by the Government Stock Farm are being utilised more and more though the effects are very patchy.

The requirement in type for the area poses difficult problems. The cane farmers require a heavy draught animal capable of getting heavy loads of cane through bogs. The provisions and rice-farmers require a lighter type which travels faster and is easier to maintain. All groups would benefit greatly by having higher yielding milk cows. At the present time the cattle population is so heterogeneous that canefarmers are able to select bulls and steers moderately suited to their requirements. The rice and provisions gardeners requiring dual purpose animal have in actual fact got animals which are neither one thing nor the other, though exceptions do occur.

An interesting contract regarding cattle ownership as a result of some people not having the desire or the facilities to manage their cows. When dry, the cow will be handed over to a second party who will have the cow served if this has not already been done. He will maintain the cow and after calving will retain the calf and milk from the consequent lactation. He will maintain the cow through its next "dry" and on calving for the second time, the cow and the calf go back to the real owner who by now, presumably has the facilities for managing it. This system is not widespread.

Feeding, Housing and Management.
Feed is not deliberately grown for livestock except for a few progressive souls who keep a patch of grass. These have probably followed the inadvertent example of I.C.T.A.

A patch of para grass (Panicum purpurascens) grown for stock. It is sowed and not grazed.

The feeding of cattle fits in fairly well with the agricultural system especially if cane is grown. Cane-tops are available in large quantities during the cane-cutting season. The estates have more tops than they can use and after removing as much as they - the estates - require, peasants who worked during the crop are permitted to gather up what remains.
Sweet potato vines are available now and again though many of the peasants wrongly believe that these cause milking cows to go dry. Other odds and ends from the garden are also periodically given to stock e.g. Rice seedling tops at transplanting time. These things however only constitute a fraction of the total requirements of the stock. For the most part, the keeper of cattle relies on being able to cut grass in waste-land or to tether his animals by roadsides etc.

All members of the family take part in this time consuming operation of collecting grass which is brought home in many ways. Much time is thus wasted during the dry season.

Tethering along the roadsides etc., is routine procedure.

The grasses available are mostly of poor quality since bamboo grass overgrows every other grass in the wet season and there is a shortage of all types of grass during the dry season.

Supplementary feeding with coconut meal, oil-cake and molasses is sometimes carried on while the draught animals are working hard or while cow is milking. This was more popular before the war than it is now. Cost precludes general usage of concentrates (1). When coconut meal is fed to cattle, a couple of handfuls are stirred with a handful of molasses in a bucket of water. Molasses is obtained by canefarmers only from the factory.


i.e. Prices have been more than trebled and these concentrates are in extremely short supply.
The building in which the cattle are housed has a thatched roof and usually without any sides. Cattle, donkeys and goats are kept inside this pen. In a few cases the floor is concrete and urine is collected in a buried drum. In other cases the floor is made of heavy planks but mostly the floor is of clay. Bedding is provided in the form of the unpaleatable bamboo grass. This may be cleaned out daily and transferred to a manure pit or stack, or it may be allowed to accumulate for 2 months before removal. Cane trash is a very common litter.

Cattle are housed during the night being fed on grass cut the previous afternoon. They are taken out and tethered after milking the next morning (if they are susceptible of milking) and brought in again about mid-day. Cows are left out all day.

Milking is done by the man of the house and if a calf is present the method is to give the calf access to the udder first for a minute or two and having had his appetite whotted, is dragged away and the udder milked out. The calf is then allowed to return for a longer period and the udder is stripped once again. Washing of the udder with water may or may not take place after the calf has been feeding.

Calves receive all the milk for the first 21 days after calving and then the above system is adopted until the calf is gradually weaned. Castration of young male animals is sometimes done at the Government Stock Farm for a fixed fee, but Indians who learnt their trade on the estates usually do the job. It is done at the age of 4-6 weeks.

The calf "breaks the ice" at milking time. Cows are milked twice daily until they begin to "dry-off".

Goats

Goats' milk is preferred to that of cows and although the Hindus are required by religion to be vegetarians, goat milk is fairly popular among them especially on festive occasions. The hides are used for making drums. Goats are easy to maintain owing to their hardiness and ability to thrive on the poor forage available. Money is often invested in goats and loss is seldom incurred.

The type is very mixed; large, small and intermediate sizes are all very common. Black animals with white markings grading down to fawn and creazy coloured goats are all common. Erect ears, drooping ears, straight noses and aquiline noses are all represented in various combinations with colour and size. Breeds involved in the ancestry of these goats arc: British Alpine, Anglo-Nubian, Sannen and Toggenburg.
In spite of the loss of identity of the breeds to a large extent, the goat has at least retained his identity as a race.

The milking performance is extremely varied. The average delivery of young, is 2 kids twice per year.

Goats receive no supplementary food and are picketed by road sides etc., all day. They may be shifted once or twice during the day.

**DONKEYS**

These are used as pack animals and for light cart work. The type is a small light grey animal with a black stripe along the back and on the tip of the tail. The donkeys are hardy and inexpensive to maintain but are not strong enough for cane and rice carting although they are used for these purposes to some extent. Their greatest use is in the provisions gardens for carting manure and grass to end from the home. Carrying vegetables to the market is an important function.

**FOWLS**

Every household observed kept a few fowls around the house and many have up to 15 or 20 various sexes and ages. They are utilised for meat and egg production though Indians prefer to hatch out the eggs and sell surplus fowls.

The type required is a dual purpose breed and the type in use has only extreme currying in the art of stealing padi to recommend it. It is neither an egg producer nor a table bird nor a dual purpose type. The scrubby fowl population results from an intermingling of the following breeds; Black Orpington, Australorp, White and Brown Leghorn, Plymouth Rock, Rhode Island Red and Bentons.

The fowls are scavengers but are fed on padi if in plentiful supply, ground rice husks, (by-product of milling), and grated coconut if the owner has coconut palms.

Only in a few cases have fowl-pens been constructed. The birds roost in trees or under the house and apart from being unhygienic, the manure is wasted and losses of chickens by mongoose attack are high. There is a growing demand for good table chickens and a few Indians are beginning to specialise with the view to catering for this market. Almost any sort of fowl brings $2.00 to $2.50 when sold.

**DUCKS**

Up to the present, ducks have been of little significance in the survey area, but the steady demand for table birds has meant that they are receiving increased attention. Their hardiness, scavenging ability and rapid increase in live-weight makes them more suitable than fowls for this purpose. Conditions are quite favourable to duck-raising and a nice piece of extension work is waiting to be carried out.
PIGS

Not at all popular among Indians on the whole. Only one or two keep a pig. However desirable pig-keeping might be from a nutrition point of view, the area is very low-lying and unless proper pens could be afforded, pigs would be more of a liability than an asset. It would be useless to try and encourage pig-raising with the food position as it is. A strong prejudice against pigs would have to be overcome.

This pig was bought "store", has been served, and the owner hopes to fatten the litter for sale. It is kept in a pen 6ft x 6ft and let out for exercise once a day. The owner is a Channer i.e. derives from the "Untouchable" Class.

N.B.

Both fish and crabs are caught in the Coroni River and in the large drainage channels in Coroni Swamp. These form quite an important article of diet at certain times of the year.

Scene on the Coroni River - a great source of fish & crabs for the neighbouring population.
PART IV

SECTION 4. - LABOUR SERVICES AND WAGE EARNING

SUMMARY

Relationship of peasants with adjacent Sugar Estates.

- numbers employed.
- proportions of young persons, males & females employed.
- days worked per individual.

Method of wage payment - wages earned per person per day.

Continuity of Labour Supply & Demand throughout year.

Other Employers affecting peasants of Survey Area.

- Imperial College Tropical Agriculture.
- Local Road Board.

Employment among the peasant gardeners.

- Exchange Labour.
- Wage Labour.

Machinery for Collective Bargaining by Sugar Estate workers.
Wage-earning plays a big part in the economy of the three groups of "peasants" in the St. Augustine-Streatham Lodge Area even though it is not a very popular aspect of their economy. In fact, all Indians "interviewed" asserted that if they could get enough land to make it possible to earn an amount equivalent to the income derived from labouring, then they would never offer their services to any employer unless it be a neighbour, the Local Road Board or a Sugar Estate. This attitude may not be general throughout Trinidad and does not imply that the conditions offered by these employers are harsh, but it simply supports the idea that the Indian is an independent cultivator by nature.

(A) Relationship between Labourers of the Survey Area and adjacent Sugar Estates

From the foregoing statement it would appear that it is only land shortage which maintains the supply of unskilled field labour to the sugar estates. The Indian population is not free to choose between independent production and labouring work. Since the former is restricted (1), the majority must accept the latter as the only other alternative - some find their way into business and urban occupations.

This indirect compulsion is a result of the "landa policy" of the Government of many years ago - a policy which was necessary for the development of the Sugar Industries. The legacies of this policy are far from being fully reaped and its effects have been perpetuated by virtue of the land distribution which it compelled. This is the background against which the present relationship between the unskilled (mostly part-time) field employees and the sugar estates should be viewed.

Important things to be considered are the continuity of labour supply and labour demand for the sugar estates, extent to which cultivators are dependent on the estates for their livelihood, section of the Indian population directly affected by estate labour requirements and the effects of their cultivation work and social events on the labour supply. The following tables throw some light on these subjects. Figures contained in them were obtained from a large sugar estate and probably represent the position fairly accurately for most of the part-peasant, part-labouring population.

TABLE (5)

Labour for Cultivation Work on a Large Sugar Estate 1947.

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Number of Male Employees and Man Days worked (ii)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Male Employees and Man Days worked</td>
</tr>
<tr>
<td></td>
<td>as % of total</td>
</tr>
<tr>
<td>No. days worked</td>
<td>Adults</td>
</tr>
<tr>
<td>300 days</td>
<td>3.42</td>
</tr>
<tr>
<td>250 - 299</td>
<td>3.34</td>
</tr>
<tr>
<td>254 - 259</td>
<td>3.48</td>
</tr>
<tr>
<td>208 - 233</td>
<td>3.13</td>
</tr>
<tr>
<td>132 - 207</td>
<td>4.03</td>
</tr>
<tr>
<td>156 - 181</td>
<td>3.32</td>
</tr>
<tr>
<td>166 days</td>
<td>79.28</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
</tr>
</tbody>
</table>

The most important things shown by this table are that 78.67% of the people employed only supply 41.54% of the total man days worked and that in this group (people working 156 days or less per annum) which represents 78.67% of the total number employed, the average number of man days worked/person/annum is 46.

Of the total male labour, the average no. man days worked/person/annum is 87.

(1) It is common to hear it said that there is no land shortage in Trinidad and attention is drawn to the unclaimed swamps and forest reserves, c.f. Appendix (I) on land utilization in Trinidad. The swamps present salinity problems, e.g. Caroni Swamp, which cannot be solved overnight. With forests, a large area is on steep slopes and cannot be cultivated, a large area is on soil types which are only capable of growing a forest. e.g. Arima forest, an extensive slice is reserved for oil prospecting and the oil industry must be respected, and of the remainder, a large area is necessary for protection of
watersheds and provision of timber requirements of the Island. Already the
imports of timber are very costly. (Value imported unmanufactured timber 1946
was $1,800,000.00).

(ii) "Man-day" refers to no. days on which a man works regardless of the time
worked in the day.

<table>
<thead>
<tr>
<th>TABLE (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of Female Employees and Man-Days (1) worked</strong></td>
</tr>
<tr>
<td><strong>CLASS</strong></td>
</tr>
<tr>
<td><strong>No. days worked</strong></td>
</tr>
<tr>
<td>Adults</td>
</tr>
<tr>
<td>300 days</td>
</tr>
<tr>
<td>260-299</td>
</tr>
<tr>
<td>234-259</td>
</tr>
<tr>
<td>208-233</td>
</tr>
<tr>
<td>182-207</td>
</tr>
<tr>
<td>156-181</td>
</tr>
<tr>
<td>156 days</td>
</tr>
<tr>
<td>117</td>
</tr>
</tbody>
</table>

This table shows similar trends i.e. 81.4% of the number of women
employed working for 54 days in the year only. For the total female employees, the
average no. Man-Days worked/person/annum is 62.

Method of Wage Payment.

Employment is on a piece-work basis e.g. cane-carrying is paid by the
ton. Weeding and cutting are paid by the "task", i.e. a unit of work which takes
4 - 5 hours to perform. A minimum wage is fixed by statute but the wages actually
paid vary slightly from one estate to another. On Caroni Estate 1947, weeding was
paid for at the rate of 61¢ per task. One task involves 18-20 rods of a cane-bed
i.e. four rows of cane. Cutting was renumerated at the rate of 61¢ for the last
task of the day and 67¢ for the second task to encourage longer working hours during
the crop. For cutting, a task varies considerably with the yield of the cane e.g.
8 rods might be given for a heavy plant crop and 50 rods for a very old ratoon crop.
60¢ per ton is allowed for carting cane and a worker might carry 3 - 5 loads per
day. Orange Grove pays 67¢ per ton for carting over a short distance and 77¢ over
a longer distance.

It is a most important observation that "the task has become synon-
mous with a day's work, and the general psychological effect is that the mental
effort to work usually ceases upon the completion of one work unit or task each day.
We regard this point as important in any attempt to induce additional output by
field workers in the Sugar Industry (ii).

Wages paid for Estate Labour.

<table>
<thead>
<tr>
<th>TABLE (7)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wages earned/ Person/ Man-Day (Men and Women)</strong></td>
</tr>
<tr>
<td><strong>CLASS</strong></td>
</tr>
<tr>
<td><strong>No. days worked</strong></td>
</tr>
<tr>
<td>300 days</td>
</tr>
<tr>
<td>260-299</td>
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<tr>
<td>234-259</td>
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<td>182-207</td>
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<td>156-181</td>
</tr>
<tr>
<td>156</td>
</tr>
<tr>
<td>1.27</td>
</tr>
</tbody>
</table>
This table shows the average earnings per man day for adults and youths of both sexes. The average earnings for men per man-day is $1.24 for men and 0.89 for women.

(1) "Man-Day" refers to the number of days on which a man works regardless of the time worked in the day.


Given that men work on the average 87 days a year and women 82, and assuming that in each household one male and one female offer their services on this basis, the total annual earnings per household would be $107.88 plus $72.98 i.e. $180.00 approximately.

The total cash income per family/annum in the survey area, varies between $600.00 and $1,000.00 (See Section on Income - Part 4). Thus, wages derived from work on the sugar estates constitute roughly 20% of the cash income.

Actually the figures for average number of man-days worked, involve areas where the Indians are much more dependent on their labour services than other areas like the survey area where the Indians spend much more time on their own land. There are very few people in the survey area who fall within the groups supplying labour for over six months in a year and the above estimate of degree of dependence on the estates will err slightly on the high side for the survey area, but not much, because right throughout the area to which the figures actually apply, the number of people falling in the higher classes are very small (but very important nevertheless) when compared with the remainder who work only for a much shorter period.

H.B. For comparison, the corresponding figures relating to factory work (i.e. sugar factories) are given in Appendix (F).

Sections of Population affected by Labour on Sugar Estates. On a large Sugar estate, the total number of field employees was made up as follows:

- Adult males - 65% 
- Young males - 2.5% 
- Adult females - 31% 
- Young females - 1.5%

1947 figures.

Continuity of Labour Supply and Demand throughout the year.

This can be observed on the following graph. In 1946 and 1947, it is a fact that from January to October, the number of people employed is directly proportional to the number of people that offer their services. From October to December, the number employed is proportional not to the supply which is large, but to the demand which falls rapidly.

From the graph it can be seen that there is a rush for employment (after the bout of Christmas spending) during January and February. After the shopkeeper has been satisfied, many drop off and as the "crop" proceeds, many tire of estate work and the number employed falls during March and April in spite of a heavy demand. Ignoring the sudden drop during May and June in 1947 which was due to a strike, there is usually another fall off in numbers employed due to the rice-planting activities of the Indians: This, in spite of a sustained demand for labour by the estates. Another reason for this fall is the result of the Indian wedding season which causes a goodly percentage of the Indian population to suffer from more or less perpetual "hang-overs". After this period when the hollow bed-post has been emptied there is another rush on estate employment for weeding etc., during August and September. Soon after this, the cane has suppressed weed growth and the estate is obliged to discharge labour during October, November and December.

The graph for 1948 so far shows an attempt to stabilise the number of people employed by taking on more "permanentas" and less "casuals" and refusing to adopt the policy of spreading the work over as many people as possible. It is hoped that by the use of rotary hoes during June and July that the frantic rush to bring weeds under control in August and September will be unnecessary thus removing the peak in numbers employed at that time. There will apparently still be a falling off in labour requirements from October to December. This will not be so marked if the new policy of employing fewer people more regularly works. To institute this policy, an incentive to work longer hours or for more days in the week is necessary, and one sugar estate is paying a bonus of 20¢ for every ten consecutive days work (excluding Sundays).
Fig. (2)

For these years the difference between the lowest number employed and the highest number employed is of the magnitude of 2,000 which is roughly 50% of the average total number employed through the year.
Other Relatively Large Scale Employers affecting the Survey Area

These are only two:

(1) The Imperial College of Tropical Agriculture employs a very significant number of regular labour by the College is subject to marked seasonal fluctuations. College employment probably affects the women of the area more than men. There is great competition for jobs at the College and it is true that most of the forms of wage-earning, working for the College is one of the most popular.

(2) The Local Road Board. This institution (see Part Two "Roads") employs 180 people permanently. Unlike the sugar estates or I.C.T.A. a fairly high proportion of these are West Indians. Wages paid are: Women - 84¢/day. Men - $1.24 to $1.50/day. Quite a few people in the survey area have at one time or another worked for the Local Board.

Employment by the "peasant" agriculturists

The necessity for employing people to assist in agricultural operations is quite an important source of expenditure (i) by the employer and income for the employee. The labour is either paid for in cash on a task or daily basis or an equivalent amount of work is done for the "employee" at a time and place agreed to by both parties. This is known as Exchange Labour.

Exchange Labour For certain operations such as rice-planting, rice-harvesting and beating and cane-cutting, the input of labour required per unit time is greater than the family unit can supply. To solve this problem, five or six men will pool their energies and go in turn to each man's holding and collectively carry out the operation. The practice encourages a collectivist rather than an individual approach to agricultural problems and should be encouraged. Unfortunately it is dying out because the holdings of five men who live in the same community are becoming more and more widely separated and because the people are becoming more unwilling to commit themselves to work at times which may turn out to be inconvenient.

Wage Labour The modern tendency is to dispense with exchange labour (ii) and hire either men or women or both to do the required work. A man cannot be obtained for any work for less than $2.00/day, but women can usually be obtained for $1.00 or $1.20/day. Skilled workers supplying their own implements receive much more e.g. depending on the state of the land a ploughman will charge $14.00 to $25.00 per acre for ploughing and levelling rice land.

Machinery for Collective Bargaining by Sugar Estate Workers

This story may be told briefly.

The first ordinance providing for the establishment of Trade Unions was not passed until 1933. The movement was opposed by most employers and managers and general dissatisfaction resulted in the 1937 riots. The Forster Commission reported that: (iii)

"the true origin of the disturbances must be traced to the more or less general sense of dissatisfaction for which there was no adequate means of articulation through recognised machinery of collective bargaining".

The Trinidad Sugar Estates and Factory Workers' Trade Union was registered in 1938 as also was the Trade's Union Council.

This Sugar Workers Union has done good work but it is more representative of the Factory Workers than the Field Employees. In the Survey Area, most of the sugar cane workers and growers have not heard of the Sugar Workers Union.

The position is unsatisfactory.

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(i) See Section on Rice-Growing - also Section on "Expenditure".

(ii) Exchange Labour would probably increase in times of Depression.


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INCOME

Four systems of agricultural practice and livestock management have now been covered. The activities together with labouring for the estates and wage-earning amongst themselves constitute the avenues of income open to peasant farmers in the St. Augustine - Streetman Lodge Area. Any one farmer may be concerned with all of these activities. The liking of the individual is reflected in emphasis on one or two of them. The most contented and prosperous farmers are those which have sufficient land to grow cane, rice and provisions as well as manage a variety of livestock. These incidentally, are the people most independent of labouring for estates. With anything less than three acres, a gardener finds it difficult to keep himself fully occupied and will seek labouring work.

The limitations of this survey are clearly seen when quantitative data regarding income is required; but if it does nothing else, it shows the need for another survey concentrating on income and Expenditure. This would show the extent to which farmers are self-sufficing, the comparative importance of wage-earning, importance of various crops and livestock in providing income and the ultimate fate of the earnings.

With the few families with which one was on familiar terms, the cash income varied from $600.00 to $1,000.00 per annum. The extreme variation in amount of labouring done on the estates, labouring for surrounding farmers, area of land used, type of production carried on and the industriousness and efficiency of the farmers make it impossible to attempt an apportionment of income between these various sources. A sample of at least a hundred farmers would need to be surveyed in detail to get this information. Dr. Jolly's rough survey, carried out during abnormal times cannot be expected to give much of a clue in a different area in less abnormal times.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

EXPENDITURE

Figures given under this heading cannot pretend to be statistically accurate; but they justify comment. Eight families were studied in detail and the manner of their expenditure gives perhaps a general picture of the disposal of their income.

<table>
<thead>
<tr>
<th>Expenditure/Family/Annum:</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeds, fertiliser and stock feeds</td>
<td>45.00</td>
</tr>
<tr>
<td>Labour employed on the holding</td>
<td>75.00</td>
</tr>
<tr>
<td>Food (excluding that produced on holding)</td>
<td>280.00</td>
</tr>
<tr>
<td>Pitch-oil, firewood, medicine and doctor's bills</td>
<td>80.00</td>
</tr>
<tr>
<td>Building, house repairs, tools, books etc.</td>
<td>45.00</td>
</tr>
<tr>
<td>Rum and Tobacco</td>
<td>60.00</td>
</tr>
<tr>
<td>Clothing</td>
<td>25.00</td>
</tr>
<tr>
<td>Rent on land and house lots, rates and licenses etc. (1)</td>
<td></td>
</tr>
</tbody>
</table>

Total = $610.00

(Number Consumer Equivalents/Family = about 4. One adult male = 1 C.E.)

The difference between this total figure and that quoted for cash income ($600.00 - $1,000.00/annum) is accounted for by purchase of jewelry which is regarded as a readily realisable asset, purchase of cattle (which is rather a spasmodic disbursement) and by savings. In actual falt, very few farmers have a definite saving policy and any surplus cash is taken up by expanding the very elastic expenditure on rum. Even when saved, money is seldom banked but kept in places unknown (11).

(1) Licenses and Taxes are:
   1 male dog $0.50/annum
   1 female dog $1.00/annum
   1 bicycle $1.20/annum
   1 cart $6.00/annum

   Water rate, Door Tax - vary with the type of dwelling.
   Door Tax is usually 96¢/annum (See Section on water supply).

(11) Post Office Savings Bank facilities are available.
The food expenditure relates to the purchase of such things as flour, sugar, fish (fresh and salt), meat, salt, spices (which are relatively quite important, some milk, eggs, condensed milk, coffee, breakfast cereals (little), bread, lentils and sometimes vegetables and fruit. In Bejucal, Dr. Jolly found that half the food expenditure was for food actually purchased i.e., about $250.00/family and this is not very different from the figure given above i.e., $280.00/family. This would be expected because of the rather stereotyped nature of the feeding habits of the Indians. This being so, the distribution of the expenditure between the various foods found in Bejucal is probably quite applicable in the St. Augustine-Streatham Lodge Area, i.e.

**Composition of Food Consumption**

( as % of total food expenditure)

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starches</td>
<td>55%</td>
</tr>
<tr>
<td>Fats and Pulses</td>
<td>8%</td>
</tr>
<tr>
<td>Sugar</td>
<td>4%</td>
</tr>
<tr>
<td>Milk</td>
<td>5%</td>
</tr>
<tr>
<td>Animal Products</td>
<td>17%</td>
</tr>
<tr>
<td>Fats and Oils</td>
<td>8%</td>
</tr>
<tr>
<td>Condiments and Beverages</td>
<td>5%</td>
</tr>
</tbody>
</table>

The expenditure on seeds, fertilizers and stock feeds is very low and is usually exceeded by the expenditure on rum and tobacco. Almost as much is spent on the latter as on clothing which accounts for 10% of the cash income.

Expenditure on weddings is not an annual expense and is only encountered now and again. From observations on weddings in 1948 it would appear that they are becoming less extravagant. Fifteen years ago, it was said that the expenditure on a wedding was roughly equal to a man's cash income for a year i.e. about $600.00. Of the weddings observed in 1948, between $80.00 and $200.00 was spent. These might have been exceptions.
PART V.

-NUTRITION & HEALTH-

SUMMARY:

General positions of Indians as compared with other races.
Deficiencies in the diet.
Remedial measures.
Diseases and other complaints in the survey area.
Approach of the Health Department.
This subject has been left deliberately until the agricultural systems and food expenditure have been discussed. By this time, the reader (if any have survived) will have some idea of the general food picture. There is no detailed information available for the survey area in particular but the Health Department has carried out nutrition surveys which should be quite applicable to the area. For Trinidad in general, analysis of weekly diet shows the following:
Consumption of nutrients per adult male equivalent per day (1)

<table>
<thead>
<tr>
<th>Race</th>
<th>Total Protein (gm)</th>
<th>Animal Protein (gm)</th>
<th>Carbohydrate (calories)</th>
<th>Vit. &quot;A&quot; I.U.</th>
<th>Vit. &quot;B₂&quot; (mg)</th>
<th>Riboflavin (mg)</th>
<th>Nicotinic Acid (mg)</th>
<th>Vit. &quot;C&quot; (mg)</th>
<th>Calcium (mg)</th>
<th>Iron (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Indian</td>
<td>66+</td>
<td>16</td>
<td>2700+</td>
<td>3250</td>
<td>0.88</td>
<td>0.82</td>
<td>12.6+</td>
<td>41+</td>
<td>270-</td>
<td>12.8</td>
</tr>
<tr>
<td>Negro</td>
<td>55-</td>
<td>20</td>
<td>2250</td>
<td>2700</td>
<td>0.76</td>
<td>0.80</td>
<td>10.5-</td>
<td>46+</td>
<td>255-</td>
<td>11.0</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sugar Industry</td>
<td>69+</td>
<td>15</td>
<td>2570+</td>
<td>2900</td>
<td>1.00</td>
<td>0.78</td>
<td>12.8+</td>
<td>38+</td>
<td>273-</td>
<td>13.4-</td>
</tr>
<tr>
<td>Coca Industry</td>
<td>42-</td>
<td>11</td>
<td>1989-</td>
<td>2190</td>
<td>0.76</td>
<td>0.82</td>
<td>12.0+</td>
<td>42+</td>
<td>226-</td>
<td>10.5-</td>
</tr>
<tr>
<td>Town Dwellers</td>
<td>61+</td>
<td>22</td>
<td>2420-</td>
<td>3532</td>
<td>0.95</td>
<td>0.98</td>
<td>13.4+</td>
<td>13+</td>
<td>313-</td>
<td>12.1-</td>
</tr>
<tr>
<td>Semi-Urban Dwellers</td>
<td>60+</td>
<td>37</td>
<td>2450-</td>
<td>3700</td>
<td>0.84</td>
<td>0.88</td>
<td>11.8+</td>
<td>37+</td>
<td>274-</td>
<td>11.7-</td>
</tr>
<tr>
<td>Oil Industry</td>
<td>42-</td>
<td>16</td>
<td>1424-</td>
<td>2097</td>
<td>0.51</td>
<td>0.64</td>
<td>9.7+</td>
<td>44+</td>
<td>231-</td>
<td>9.4-</td>
</tr>
<tr>
<td>Dr. Platt's Minimum</td>
<td>60</td>
<td></td>
<td>2500</td>
<td>5000</td>
<td>1.50</td>
<td>1.80</td>
<td>12.0</td>
<td>30</td>
<td>800</td>
<td>20.0</td>
</tr>
<tr>
<td>Summary for Colony</td>
<td>59</td>
<td>18</td>
<td>2400</td>
<td>2900</td>
<td>0.83</td>
<td>0.81</td>
<td>11.5+</td>
<td>44+</td>
<td>270-</td>
<td>11.8</td>
</tr>
</tbody>
</table>

+ Sufficiency/ by Dr. Platt's minimum standard.
- Deficiency

From this table the following conclusions may be drawn:

(1) There is a general and serious deficiency of Vitamin "A", Vitamins "B₁" and "B₂", Calcium and Iron in the food consumed.

(2) Total protein, Calorific Value of food and the vitamin, Nicotinic acid are borderline cases. Vitamin "C" appears to be the only thing for which there is a clear cut sufficiency.

(3) The Indians on the whole are much better off than the Negroes. Indians are short of Vitamins "A", "B₁", "B₂", and Calcium and Iron. Negroes have these deficiencies but in addition are short of protein, carbohydrate and nicotinic acid.

(4) People engaged in the Sugar Industry (mostly Indians) are better nourished than those in the Cocoa Industry, Oil Industry (mostly Negroes), Town dwellers and semi-urban dwellers although the townsfolk, although deficient, are better off for Vitamin "A" and "B₂" (Riboflavin).

The survey also showed that the incidence of Dental Caries is high and that there are not significant seasonal variations in nutrient supply except for Vitamin "A" which is more abundant during the mango season in April, May and June, and also during the Orange Season in January and February.

(1) Taken from Annual Report of Health Department. 1946.
Reference to the appendix on Marketing figures at TunaPuna would support this view with the qualification that the starchy root crops are relatively scarce during May, June, July, August and September becoming more plentiful in October, rising to a maximum during November, December, January and February and then falling off in March and April.

The question arises as to how true these general observations are for the survey area. Food consumption by Indians is fixed to some extent by custom and is not subject to great variation. This is indicated by a survey of consumption of green vegetables by Miss B. Campbell of the Health Department quote - "Most of the families consumed greens and fruits but the quantities used were small and they were only served once or twice a week, due to cost of distance from market proving the importance of increased home production of the perishable leafy green vegetable".

Families eating greens regularly.

<table>
<thead>
<tr>
<th>Table (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>San Fernando</td>
</tr>
<tr>
<td>Lafe Ste. Madeleine</td>
</tr>
<tr>
<td>Guisco</td>
</tr>
<tr>
<td>Guisco-Tamana</td>
</tr>
</tbody>
</table>

In these widely separated areas, the consumption of greens (probably the most variable item in the diet) varied from 100%-80% for Indians but from 100%-60% for Negroes.

These general observations on East Indian nutrition probably aren’t far out when applied particularly to the survey area. A survey of clinical symptoms of these various deficiencies in the area is a necessary adjunct.

The remedial measures which have been recommended for the whole Island are:

(a) Immediate measures
1. Distribution of milk to all school children.
2. Fortification of this milk with a Vitamin "B" complex concentrate e.g. food yeast, and a Vitamin "A" concentrate e.g. shark oil.
3. Fortification of all bakers bread with Calcium e.g. hydrated lime.

(b) Long term measures
1. Increase the home production and consumption of peas, beans, green leafy vegetables, yellow fruits and vegetables.
2. Educate the population through schools and adult evening classes on cooking methods and the value of local foods.
3. Fortification of all wheat flour with Vitamin "B" Complex and Calcium.

These measures are partly a challenge to the Department of Agriculture. The milk must be forthcoming which means more and better cows which require better feeding and management and an efficient and sanitary method of collecting milk for retail to replace the present unsatisfactory arrangements. Again, the first and second propositions in the long term measures will be impossible without an efficient agricultural extension organization. Moreover, one is not satisfied that the measures suggested are the only ones. Too little is known about the nutritive properties of minor articles in the diet e.g., woolly pyrol, saijun (koringa) tumoric, hog plum, chonet, star apple, sapodilla, tamarind, avocado pear etc... To extend home production of perhaps one of these might be much more effective than fortifying bread with certain vitamins. To bring the disease "Papew mesoie" under control would mean innumerable small increases in the consumption of Vitamins "A" and "C" and these are the increases that count.

Diseases and Complaints in the Survey Area.

Of the following list, the old established endemic diseases are the most important.

Tropical Ulcer - rather common.
Leprosy - one recovered leper was observed.
Tuberculosis - probably more important than is apparent.

Veneral diseases - a few cases of Yaws and Syphilis.

Whooping Cough - common among young children in wet season.

Helmithic diseases- A survey of County St. George (including my survey area) by the Health Department in 1946 showed that 35.5% of the population to be infected with hookworm and 27.1% to be infected with ascaris.

Malaria is worst in people residing on the low-lying rice lands of Streatham Lodge though its extent cannot be estimated without a detailed examination.

A few cases of syphilis were spoken of in the area. One subject stated that he obtained same by sucking oranges on a very hot day. - a highly original if unconvincing source.

Facilities available for Treatment and other Health Services.

Malaria - Treatment can be obtained at the Tacarigua clinic. In the worst areas in the island school children are treated by head teachers under the direction of the Health Department. This does not cover the survey area.

Malaria studies, anopheles investigation and control by dry spraying bromeliads with copper sulphate, drainage and use of D.D.T. are carried out by the Health Department. This latter work has only just begun and does not include Streatham Lodge or St. Augustine as yet.

Veneral Disease - The Caribbean Medical Centre (consisting of a central diagnostic clinic, a hospital and a laboratory) and nine field clinics are maintained. One at Tacarigua serves this area.

A total of about 10,000 people were treated for various ailments at the district hospital at Tacarigua (35 beds), and this is only one of 25 other hospitals or dispensaries in the island.

Lepers - go to the Leprosarium at Chacachacare Island and there are seven mainland dispensaries.

Ro. Tuberculosis - the Health Department proposes to include two or more clinics, two hospitals for infectious cases, a sanatorium, a school for tubercular children and financial provisions for needy tubercular children. Lack of funds hold this program back.

The Department is trying to clean Yaws up district by district using Mobile Clinics.

Hookworm - Improvement of sanitary arrangements is the main approach and propaganda methods are in use. Their effect is very patchy as yet. The survey area has not been influenced at all. Their sanitary facilities are deplorable. They often overflow in wet weather, are usually open to flies and other insects and are often disregarded by the children anyway.

The propagandising activities of the Health Department have also covered malaria, venereal diseases, other helminthic diseases, nutrition and cooking. 50 School, colleges, Junior Red Cross and other youth groups have been the main receivers of this propaganda and they presumably are supposed to carry the ideas into their homes. This is not nearly enough but it is a good start.

An interesting development is the use of voluntary groups to spread the gospel of the Health Department. It is hoped to establish these groups in all districts and give them some elementary training. If these are enthusiastic about health, these are probably also enthusiastic about agriculture and if the former can be organized into a useful body it should be possible to do the same with the latter if necessary. Such a group could be of great assistance to an isolated extension officer in any district.
What is the use of all the detail in the foregoing report? Is not a good 90% of it just a conglomeration of irrelevant matter? In answer to these questions, the following conclusions are submitted:

1. The Survey Defines the Starting Points for Extension Operations.

Without an intimate knowledge of the people, their living conditions, their institutions and their methods of husbandry, (all of which show the extent to which the problems have already been solved by the peoples' own efforts and the efforts of others), it is impossible to know just where to start with extension work. Most of the factors in the life of the people are in a state of evolution. It is important to know what stage has been reached and to consider where the trends are leading them. The result of having an ill-defined starting point would be either that one would run 300 yards in a 100 yard race or worse still, one might try to join the race for the final 50 yards only when sooner or later one would be recalled to the proper starting line after much waste of time and effort.

Every observation in this report helps to reveal the position of the starting line and on this score alone, every observation, no matter how trifling, is worth while. Thus from Part One on "The People", it is known amongst other things, that there is a powerful incentive to greater wealth which is only imperfectly correlated with a desire for a higher standard of living (ref. the fact of sale of important foods when actually they should be consumed). It is known that the religious institutions will present obstacles in some cases and will lend support to other programs which might be considered desirable - that clothing worn, language spoken, types of dwellings erected, religions, attitude to agriculture etc., are in a state of flux. In their relationship with those in authority it is important to note that the peasants would like to be hand-fed. If there is a flood, the Government must pay compensation. If there is a drought, the Government must be forthcoming with a water supply free of charge. As regards their attitude to modern trends in agricultural techniques, it is frequently maintained that Indian customs and religions are extremely conservative and that it is very difficult to provoke changes in customary practices. In answer to this, several examples of willingness to accept new ideas could be stated e.g.

(a) On the experimental irrigated rice plots of the Department of Agriculture and I.O.T.A. which are situated in the St. Augustine area, trials with the growing of rice during the dry season have been carried out with a moderate degree of success. Without any advice from other institutions, the Indians ricegrowers quickly recognised the importance of the idea and several have tried it out for themselves.

(b) Again on the Department of Agriculture rice plots, the ricegrowers observed the use of the rotary-hoe in preparation of the land. They were informed that such an implement could be hired from a machinery agent in Port of Spain. Several Indians grouped together and actually hired a rotary hoe for the preparation of their land.

(c) There is the man who observed the growing of grasses specifically for stock feed on the College farm. The example was emulated but with an inferior type of grass. Dhooli Singh was informed through his wife that a superior grass was available at the College and that roots would be given to him if he cared to come along. In spite of the heavy pressure of rice planting work, Singh turned up the very next morning for his cuttings.

(d) There was also Juggat who insisted that he be shown around the College farm and have various procedures explained to him.

The assumption of the Indians is more apparent than real and the reason why they have not adopted modern ideas is not because they will not, but simply because they have never had any instruction or guidance in them.

From Part Two on "Amenities and Services Available to the People", it is known how effective previous policies have been and to what extent certain problems have already been solved.

Part Three on "Soils, Climate and Vegetation" describes the starting point from a physical viewpoint and it shows the limitations which will be imposed on any policy by natural conditions (i.e. in the analogy with a race, the soil, climate and vegetation, limit the length of the race-track).
This knowledge also helps to account for the present distribution and management of crops. Ideally, study of the soils should make it possible to show trends in fertility. It can be said that none of the soils are rich, that most of them in fact are poor and from statements made by the peasants themselves it would appear that year by year, fertility is declining noticeably. A series of soil analyses on the same fields over a period of years, or figures for yields over a period of years is necessary to indicate this trend and to express it quantitatively.

Part Four describes the economy of the population as it is, and draws attention to the fact the relationship between the peasant agriculture and labour requirements of the neighbouring sugar estates is a very important one and cannot be overlooked. More important however, is the observation that in the extension work as it relates to agricultural practice, it will not be necessary to start from "scratch" but modification of existing systems can be aimed at.

Part Five defines the starting point in regard to nutrition and health of the population concerned.

2. The Survey Indicates the Problems of the People as They Exist.

Returning to the analogy with a race, it has been said that the survey defines the starting line and shown how far it is possible to run. It also points to the series of obstacles which must be met and dealt with on the way. Furthermore, it points to certain key obstacles which if negotiated, makes it easy to overtake the others. In other words, the survey indicates the people’s problems (both those which are recognized by the people and those which they take for granted) and their relative importance.

It is not intended to itemize all the problems which are indicated by the survey - that is only part of the job of the people carrying out surveys. One of the great advantages of a comprehensive report is that innumerable people with different approaches can draw conclusions which escaped others. Some of the outstanding points arising from the survey are listed below:

From Part One - The People (N.B. See "Foreword" - this section is actually the job of the Sociologist).

Given that the problem in its broadest sense consists of raising the standard of living of the people, this part reveals weaknesses in social conditions which must be remedied e.g.

(a) Relative to extension work, perhaps the biggest problem lies in the lack of any group organisation in the community - in fact there is precious little community spirit shown at all in the approach to problems. The result of this is that extension work can only take place on an individual basis. There is no village head -man, no council, no co-operative organisation through which an extension policy can be directed. It is therefore much more difficult to keep in touch with the thought of the community and this places an impossible burden on an extension worker if he has a large population to deal with.

(b) Poverty, general ignorance and illiteracy are grave problems on which it is not proposed to elaborate.

(c) Decaying of the Hindu religion with consequent instability of the family unit, and varying interest in agriculture by young people also provides food for thought.

(d) For about 60% of the people, unhealthy dwellings resulting in high rate of malaria infection, high incidence of colds, whooping cough and related complaints are problems. With these dwellings, built at ground level, even if a drain is dug around the house, the floor is always damp and cold especially during the wet season. Ventilation is often bad and leads to the harbouring of mosquitoes. In almost all cases, the sanitary arrangements are unsatisfactory and in about 60% of the houses, the arrangements are deplorable - flies and mosquitoes breed without inhibition.

(e) So far as the few negroes in the area are concerned, the incompatibility between Indians and Negroes is a problem.

These problems concern the Education, Social Welfare and Health Departments more than the Agriculture Department but since it is the welfare of the people and not merely improved agriculture which is the aim of extension work, no extension officer can afford to divorce himself completely from these problems. His main concern will be the agricultural problems and his contribution to social welfare will lie in making the people more prosperous and insuring that they are better fed. However, the solution of agricultural problems may have a profound effect on social problems and conversely, the solution of social problems will make the job of the extension worker very much easier. This is tantamount to saying that all problems ultimately resolve themselves as social problems and unless this was so, the agricultural extension worker could not claim that his objective is the welfare of the people.
From Part Two - Amenities and Services.
This part merely describes the attempt at solution of problems about which there is already an awareness, even if the resulting policies have been ineffective in varying degree. The only section to which anything need be added is that relating to “Entertainment” because it is nobody’s concern. Some policy is necessary for people have little to do except drink rum, gamble, best wives and instigate court cases in their leisure hours.

From Parts Three, Four and Five.
Basic problem in peasant agriculture is to raise it to a much higher standard of efficiency by reducing costs of production and increasing yields. This broad problem may be divided up as follows:

Soil Fertility and Manuring:
- Soils are poor and gradually deteriorating further due to intensive cropping and absence of planned rotations.
- Use of pen-manure is haphazard.
- Artificial fertilizers are used in a thoroughly unenlightened manner.

People recognize the value of applying pen-manure to any crop, but the practice is limited by shortage of manure (due to lack of stock and improper utilization of excreta), lack of transport facilities in many cases, and during the main planting period, the roads are impassable in some parts even if the peasant has a cart. With artificial fertilizers, the peasants copy the estates—particularly with sugar cane when sulphate of ammonia may be applied in quantities ranging up to 400 lbs./acre. The response is striking. With food crops, the use of sulphate of ammonia is popular in the dry season, while in the wet season, only a few crops are considered worthy of the so-called “salt.” The response is very varied. The peasants attribute magical properties to the artificial and it is commonly believed that the spirit of the salt enters within a few minutes of its application. The problem would appear to be to find out what response the various crops give for different artificial on the different soil types and decide whether or not the increases in yield justify the cost of purchasing and applying the fertilizer. Cost is the main limiting factor concerning the use of artificial fertilizers at present.

Land Tenure. The problems are:
- Land shortage and sub-division leading to scattering.
- Disinteregratedness of land-lords in land use.
- Trafficking in leases on rented holdings.

Cultivation Implements and other Agricultural Equipment: Problem is:
- To increase the amount of work which can be done in one man-day and to increase the efficiency of cultural operations.

Many peasants have both a plough and oxen but the great majority carry out all their cultivation by hand-forking and hoeing. Seed drills and cultivators are unknown. This means that the out of work is low and keeps production costs high. On Orange Grove the problem has been partly solved by Estate which ploughs the cane-farmers’ land for them with heavy implements and deducts the cost from the value of the cane produced. The danger in this practice is that the treatment moted our to the soil (it is often extremely drastic) while all right for cane might render the soil less suitable for other crops.

As regards transport, about 30 - 50% of the people have their own carts. Transport is a big problem for the remainder. In addition, the type of cart in use is very hard on roads especially if the surface is a little soft. This emphasizes the problem of road maintenance.

Water Supply: (for agricultural purposes i.e. rainfall).
Lack of water control on unirrigated rice-land is an important defect. System of draining causes the land to dry out very rapidly in the dry season.

Shortage of water in February-March-April make these months almost unproductive.

Crop Culture - Seed Storage
Wastage in seeds stored for planting is extremely heavy due to weevils and other pests of stored materials.

Crop Culture - Management of Growing Crops.
Main problem is weed control.
In the cane-growing system, weeds are kept down from May - August by the intensive cropping. The cane is then planted in weed-free land and this kills out all woods completely, in the following wet season.
In the rice-growing system, ordinary weeds are killed out when the land is flooded and water woods are killed during the dry season, although ordinary woods constitute a serious problem during the dry season.

With provisions gardening, the weed problem is worst and is the main factor in causing high production costs.

Crop Culture - Pests and Diseases: (The more important ones)
- Froghopper of sugar cane - very serious in some years.
- Insect borer of pigeon peas (not identified - prevents treatment as a perennial)
- Weevil and other vermin in stored grain (Fumigants in use destroy viability)
- Virus and borer attack of cow-peas - prevents growing altogether in dry season.
- Virus and weevil attack of corn in the field.
- Birds in rice nurseries and other freshly planted gardens.
- Crab attacking growing rice (not observed).
- Rats and mice attacking stored rice. (Bed where the house has a low plank floor).
- Damping off of seedlings in nurseries.
- Blossom wilt and Fusarium wilt of tomatoes.

Crop Culture - Utilization and Consumption.
- Main problem is to persuade people to eat instead of selling protective foods.
- Cooking methods probably often greatly reduce the nutritive value of many foods.
- There are few products for which a surplus can be readily stored.
- Foods consumed show a deficiency in protein, Vitamin "A", Vitamin "B", Calcium and Iron.

Crop Culture - Special Problems:
- Important general problem is that diversification of cropping often goes so far as to prevent the use of machinery for weeding and cultivating etc.
- With rice and cane, the high cost of employed labour reduces the profits to a very low level.
- With cane, the long delays in weighing and unloading lead to discontent.
- With rice, the method of transplanting is time-consuming and costly.
- Sweet potatoes and yams are very low yields.

Crop Culture - Varietal Problems:
- Some varieties are often expected to perform well in both wet and dry seasons.
- Lack of uniformity in varieties of some crops especially rice, pigeon peas, corn, sweet potatoes and cowpeas.
- In many cases, varieties adopted to the area are lacking e.g. pigeon peas, woolly pyrol, sweet potatoes, avocado pear.
- With cane a big drawback is the absence of a variety which combines the characteristics of "Shedding Trash" with high yield and a good rottuming capacity.

Livestock Husbandry:
- Poor feeding especially during the dry season is perhaps the main problem. (Peasants "cannot spare the land" to plant grass).
- Types of cattle, goats and fowls are heterogeneous and often unthrifty.
- Problem is to raise the standard of efficiency of the type of animals.
- Housing facilities are often quite inadequate - especially for fowls.
- Facilities for collecting, selling and distributing of animal products is bad.
- Storage or preserving methods for surplus animal products is non existent e.g. eggs.

Wage Earning:
- Clash of high labour requirements by estates with peasant gardening activities is May and June.
- Ineffective machinery for collective bargaining leads to discontent.

Classification of the Problems: The problems noted haphazardly above fall into two groups:

Group (1) Problems - "Technical Problems" e.g.: 
- a. Maintenance and building up of soil fertility:
  - Adoption of soil conservation measures,
  - Use of suitable rotations,
  - Proper manufacture and use of pen-manure,
  - Efficient preparation of the soil,
  - Use of "artificialis" in an enlightened manner etc.
Group (1) Problems

b. Maximisation of crop yields by:
   choice of suitable crops and varieties
   Control of weeds, pests and diseases
   Efficient utilisation of water available
   Effective harvesting and storing methods etc.

c. Maximisation of yields of livestock products by:
   Use of most suitable breeds
   Properly controlled breeding and feeding
   Enlightened management etc.

Group (2) Problems & "The Social, Political and Economic Framework within which Production takes place".

In spite of a perfect agricultural system so far as technical factors are concerned, the people might still be quite insecure due to such things as:

a. Insecurity of system of land tenure.

b. Absence of or poor processing of the products,

c. Uncertainty of markets,

d. Lack of transport or central storage facilities,

e. Decay of society e.g. break-up of the family unit,

f. Political tom-foolery.

The fundamental agricultural problems which fall into Group (2) are:

1. The General Shortage of Agricultural Land. This problem is probably more real than is apparent. It has been noted in Part One that the Indians have a generous nature and even if isolated areas of good agricultural land are available in some areas, the Indians will not settle on it if they become cut off from their fellow Indians - family ties are very strong. Either a whole community must be shifted or there will be very little shifting at all. Thus, if available land is not settled, the conclusion that the people have ample land is unjustified.

2. Scattering of Garden Lots. - "Sub-division" is hardly the correct term to apply because it has become associated with the scattering of gardens consequent upon the system of inheritance. This only partly accounts for the sub-division of lots in the survey area. The present position has arisen mainly through land shortage resulting in the purchasing and renting of small lots wherever they could be found.

3. Lack of Village Leaders and Community Organisations. This problem has already been fully discussed in Part One of this report.

The fundamental problems in Group (1) are those connected with the Building up of Soil Fertility. Reference to the diagram (on next page) giving an analysis of the agricultural problems shows that the great bulk of the problems are linked to the general problem of raising the level of soil productivity.

It is clear that if these three fundamental problems in Group (2) and the Main Problem of impoverished exhausted soil in Group (1) could be solved, then the backbone of the difficulties would be broken: The Extension Service would have travelled a long way on its mission of putting peasant agriculture on a stable economic basis and thereby raising the standard of living of the people.

3. The Survey often points to Solutions or Likely Lines of Attack on the Problems.

It is here that the main reason for classifying the problems into the aforementioned groups (1) and (2) is seen. The survey indicates the local occurrence of problems in Group (2) - i.e. problems associated with social, political and economic framework - but they will be of general as well as local significance. The approach to them must therefore be general and all-embracing and the "Surveyors" will usually not be in a position to suggest solutions because what might work for one area might be quite useless in another. The policy which is ultimately adopted must be such that it will provide solutions in all districts.

The survey indicates the group (1) or technical problems also, and although they may possibly be of wider occurrence, the approach to them must be local. Thus, nobody would be in a better position than the agricultural Extension Officer (who had directed the survey in his area) to suggest solutions for the problems which exist. A few examples of how the survey indicates possible solutions or lines of attack are:
(1) Problem is low organic content of the soil.

Survey points to - (a) Annual burning of cane trash
(b) Partial burning of rice straw and of brushwood and grass.
(c) Insufficient and poor manufacture of pen manure - waste of urine due partly to ignorance and partly to poor housing of stock.

(2) Problem is insufficient water in Dry Season.

Survey points to - (a) Possibility of extending the existing irrigation system.
(b) High water table even during dry season - suggest use of windmills for irrigation as in Barbados.

(3) Problem is shortage of Stock Feed in Dry season.

Survey points to - (a) Large areas of rangeland uncropped in dry season - suggest planting of a fodder grass.
(b) Considerable wastage of cane-tops during "the crop" - suggest collecting and ensiling on community basis.

(4) Problem is heavy road maintenance requirements.

Survey points to - (a) Possibility of general use of rubber-tyred carts.

(5) Problem is shortage of protein in diet.

Survey points to - (a) Suitability of the area for ducks.
(b) Wide scope for improving culture of woolly pyrol, coopsars and pigeon paws.
(c) Possibility of growing soya beans and groundnuts.

(6) Problem is deficiency of vitamins and minerals.

Survey points to - (a) Neglect of minor articles in diet by nutritionists.
(b) Destructive methods of utilisation.

Conclusions as to the Applicability of the "Survey Approach" in Trinidad.

So far, it has been tacitly assumed that the "survey approach" is the right one. It was the intention of this exercise to apply that approach to a certain area. It was not intended to investigate the soundness of, necessity for or applicability of this approach. Nevertheless it is deemed desirable to clear up any possible misunderstandings which might arise as to the efficacy of this method in an extensive area. In the "Foreword" to this report it is stated that this particular survey is rather artificial and quite up-in-the-air, because it has not been carried out as a result of a widespread policy and therefore does not link up with other similar agricultural surveys, let alone other social and administrative surveys.

(1) It is not sufficient for those at the top to claim that such a survey reveals nothing new. Even if this was true (and that can usually be doubted), other effects make it worthwhile. Knowledge of this kind, placed at the disposal of all members of the service would help to integrate the thinking and actions of the whole Extension Branch quite apart from providing pegs on which the subsequent detailed surveys can be hung. Furthermore, it would assist in the "acclimatisation" of any new members joining the department.

The general survey should include statements on:
- Administrative structure and local government.
- Background, distribution and activities of the races of people represented.
- Rate of increase, literacy, Nos. employed in agriculture and movements of this population.
- Social structure, community life and religions of the people.
- Structure and aims of Agricultural Extension Service - Staff and duties.
- Agricultural Education - school gardens and the 4-H Club movement.
- Transport facilities - communications - Water supply etc.
- Marketing and Credit facilities - co-operative organisations.

Maps - geological, topographical, rainfall, soils and vegetation with explanatory notes.

State of Health and Nutrition of the different races and occupations.
For the whole of the area, and population which is the concern of an Extension Branch in a department of agriculture, it is not implied that detailed surveys (of which this one is rather a poor example) should cover the whole area and population - except for very small islands there would never be the staff available to do this within a reasonable space of time. Although the broad functions of surveys do not change, the actual method of application will need to be adjusted for any extension service. It will depend partly on the uniformity or variability of the life of the people who come within the scope of the extension service, but the question which one would anticipate in the case of Trinidad is - "Who is to carry out the surveys and where?" The answer to this question depends mainly on the availability and standard of efficiency of the junior staff; and generally speaking it can be said, the more that can be entrusted to the junior field officers, the better. It might be excusable to suggest how the survey approach might be implemented in Trinidad with the existing blue-print structure of the extension branch, and with the existing staff.

The method suggested below involves the execution of first a general or "master survey" for the whole of Trinidad and Tobago, followed by detailed or "pilot surveys" in vital representative areas. The information thus obtained would provide a mosaic, gaps in which could be filled in by subsequent activities of the field officers.

The General Survey This should cover the whole of Trinidad and Tobago and should be carried out by one or two senior officers of long standing. A copy of a report on this survey should be placed in the hands of every member of the extension service capable of appreciating it.

The Detailed Surveys (Pilot Surveys). For extension work, Trinidad is split into three major divisions - North Trinidad, South Trinidad and Tobago. The extension staff in, say, North Trinidad is:-

- One Agricultural Officer
- Four Agricultural Assistants
- Sixteen Field Assistants

It would be best to tackle the surveys on a divisional basis with the Agricultural Officer directing and participating. In North Trinidad, the surveys might be tackled as follows:

1. Classify the agriculture in North Trinidad
   a. Estate - Hillside cultivation - Cocoa and Citrus growing
      Flat cultivation - Sugar Cane
      Seaside cultivation (mainly) - Coconuts
   b. Peasant
      Semi-peasant - Hillside - Cocoa and Citrus
      Mixed gardening (mainly pigeon peas)
      Flat - Mixed gardening including rice
      Cane farming

Footnote (i) continued from previous page:

History of land tenure and land use in Trinidad - growth of settlements
Progress of peasant as opposed to plantation agriculture - relationships between estates, peasant cultivators and labourers.
Importance of the various crops in general terms - imports and exports of agriculture commodities - history of the growing of the more important crops e.g. sugar cane, cocoa, coconuts and citrus.
History of livestock importation and usage.
Past and present activities of Stock Stations, Experiment stations and Brooding stations.

Much of this information is to be found in annual reports of the Agriculture, Education, Social Welfare and Health Departments. Much can be found in the yearbooks and census returns. "Proceedings of the Agricultural Society", reports on economic surveys by I.C.T.A. Staff and other miscellaneous publications also contain useful information. All this information needs to be collected and collated. If the help of other departments can be enlisted, so much the better - the report might even be written up jointly by members of various departments but the extension officers should have all the information at their finger-tips regardless of how it is obtained.
(2) The pilot surveys should throw light on these seven types of cultivation. The first three relate to Extento Agriculture for which methods are more or less stereotyped and regarding which, information is readily available. They offer very much less difficulty than might be expected in the surveys of the four main types of peasant agriculture about which information is lacking. Surveys of estate agricultural could perhaps best be carried out by comparison with peasant methods i.e. it would be necessary to select areas for survey in which estate and peasant methods exist side by side. It would be easy to do this for sugar cane where estate cane-cultivation and peasant cane-farming may be in suo in more or less adjacent strips; and it probably would not be necessary to look far to find the same sort of thing in regard to citrus and cocoa. There is no peasant cultivation of coconuts and there is no capitalistic production of food crops and rice. Thus the surveys necessary would be:

(a) On a hillside area including peasant and estate production of cocoa & citrus (1).
(b) On a hillside area representing peasant production of food crops e.g. parts of Marecas Valley.
(c) On a flat area including estate cane and canefarmers e.g. Orange Grove Estate.
(d) Representing peasant production of food crops e.g. St. Augustina area.
(e) On coconut estates - this survey should present little difficulty and take little time.

(3) The areas of these surveys should then be carefully selected and the geographical limits fixed. The Agricultural Officer should prescribe the minimum requirements of information to be obtained and place each of his four Agricultural Assistants in charge of one of the first four surveys such that each will be working on the type of agriculture of particular importance in his county (i.e. Survey 1 by the Agricultural Assistant from St. Andrew, 2 by A.A. from St. David, 3 from St. George and 4 from Caroni). Four Field Assistants should then be placed at the disposal of each Agricultural Assistant with the same regard paid to the areas in which they will subsequently work.

(4) The Agricultural Officer should then start Survey No. 1 with his staff of one agricultural assistant and four field assistants. Having shown them by his own example how the survey should be tackled and having made the aims and objects of the survey clear to the staff, it can be left in the hands of the Agricultural Assistant. The Agricultural Officer could then set the next three surveys in motion in the same way. The survey period should be at least one year. After completion of the surveys there will exist four nuclei of knowledge on which the Field Assistants, now trained in the art of "surveying" (i) can build when they return to their respective wards. The importance of the Field Assistants as vital links in the extension programme will have been confirmed beyond all possible doubt and in their areas, local variations on the "pilot" areas will be immediately obvious. Records of those variations which gradually accumulates for the whole of the North of Trinidad would complete the picture of the life and agriculture. By this approach, the information should be obtained with the maximum of accuracy and with the minimum waste of time and effort. (The Survey of Coconut-growing, so far ignored could perhaps best be carried out by the Agricultural Assistants on a County basis after the first four pilot surveys have been completed).

(1) It may not be possible to find citrus and cocoa with both types of management side by side. Under such circumstances, separate surveys in cocoa and citrus area where both forms of production are represented would be necessary.

(ii) The present "crop surveys" being carried out by the Field Assistants, is no sort of training in the art of survey - it is possible to carry out such a survey without alighting from a bicycle and without establishing any personal relationship between the "surveyor" and the "surveyed".
### APPENDIX (A)

Statistics relating to the Population of Trinidad (& Tobago)

<table>
<thead>
<tr>
<th>Total Population 1946</th>
<th>Composition</th>
<th>Table (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td>White</td>
<td>Black</td>
</tr>
<tr>
<td>Male</td>
<td>7806</td>
<td>129,092</td>
</tr>
<tr>
<td>Female</td>
<td>7477</td>
<td>132,393</td>
</tr>
<tr>
<td>Total (iii)</td>
<td>15283</td>
<td>261,485</td>
</tr>
</tbody>
</table>

(i) Mostly Syrian.
(ii) Including 150 of unstated nationality.
(iii) Excluding East Indians, the grand total is 362,223. Of these, 296,204 were locally born and 66,019 were foreign born.

### TABLE (2)

<table>
<thead>
<tr>
<th>Number indentured</th>
<th>Number subsequently</th>
<th>Present No. E. Indians</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labourers imported</td>
<td>shipped back to India</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1845 - 1917</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>147,592</td>
<td>43,913 (i)</td>
<td>195,747</td>
<td>92,608</td>
</tr>
</tbody>
</table>

(i) Balance = 103,679, i.e. permanent immigrants.

### TABLE (3)

(The increase in Population of East Indians in Trinidad)

<table>
<thead>
<tr>
<th>Ten Yearly Interval</th>
<th>Number of Indian Immigrants in Trinidad</th>
<th>No. Trinidad-born Indians</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1851</td>
<td>3,993</td>
<td>-</td>
<td>3,993</td>
</tr>
<tr>
<td>1861</td>
<td>13,468</td>
<td>-</td>
<td>13,468</td>
</tr>
<tr>
<td>1871</td>
<td>22,880</td>
<td>4,545</td>
<td>27,425</td>
</tr>
<tr>
<td>1881</td>
<td>36,020</td>
<td>12,800</td>
<td>48,820</td>
</tr>
<tr>
<td>1891</td>
<td>45,577</td>
<td>24,641</td>
<td>70,218</td>
</tr>
<tr>
<td>1901</td>
<td>47,869</td>
<td>38,714</td>
<td>86,383</td>
</tr>
<tr>
<td>1911</td>
<td>50,565</td>
<td>60,326</td>
<td>110,911</td>
</tr>
</tbody>
</table>

Recruitment of East Indians ceased in 1917

<table>
<thead>
<tr>
<th>Year</th>
<th>Number (i)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921</td>
<td>37,354</td>
<td>84,066</td>
</tr>
<tr>
<td>1931</td>
<td>23,255 (1)</td>
<td>115,412</td>
</tr>
<tr>
<td>1946</td>
<td>11,457 (1)</td>
<td>184,290</td>
</tr>
</tbody>
</table>

(i) This decline in the number of immigrants living in Trinidad was due to the advancing age of the remaining immigrants.
<table>
<thead>
<tr>
<th>Town or County</th>
<th>Indian Population 1931</th>
<th>Indian Population 1946</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port of Spain</td>
<td>3,340</td>
<td>7,206</td>
</tr>
<tr>
<td>San Fernando</td>
<td>2,679</td>
<td>6,806</td>
</tr>
<tr>
<td>Arima</td>
<td>534</td>
<td>952</td>
</tr>
<tr>
<td>County St. George</td>
<td>23,939 (i)</td>
<td>40,744</td>
</tr>
<tr>
<td>&quot; St. David</td>
<td>140 (ii)</td>
<td>141</td>
</tr>
<tr>
<td>&quot; St. Andrew</td>
<td>8,968 (ii)</td>
<td>7,944</td>
</tr>
<tr>
<td>&quot; Nariva</td>
<td>4,764</td>
<td>6,061</td>
</tr>
<tr>
<td>&quot; Mayaro</td>
<td>301 (ii)</td>
<td>520</td>
</tr>
<tr>
<td>&quot; Caroni</td>
<td>32,503 (i)</td>
<td>42,116</td>
</tr>
<tr>
<td>&quot; Victoria</td>
<td>39,158 (i)</td>
<td>53,667</td>
</tr>
<tr>
<td>&quot; St. Patrick</td>
<td>19,111</td>
<td>29,327</td>
</tr>
<tr>
<td>&quot; Tobago</td>
<td>176 (iii)</td>
<td>231</td>
</tr>
<tr>
<td>Waters of Colony</td>
<td>54</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>138,667</td>
<td>195,747 (iv)</td>
</tr>
</tbody>
</table>

(i) Main sugar producing counties

(ii) In these areas, and especially in the cocoa producing areas, labour is supplied mainly by West Indians.

(iii) Tobago is almost entirely West Indian.

(iv) Over half this population lies within the age group 0-19 years.

Table (5)

<table>
<thead>
<tr>
<th>East Indian Religions - Percentage</th>
<th>1931</th>
<th>1946</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>80.5%</td>
<td>77.6%</td>
</tr>
<tr>
<td>Moslem</td>
<td>18.2%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Others e.g. Vedic</td>
<td>1.3%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>
Table (6)

Literacy of East Indians

<table>
<thead>
<tr>
<th>Class</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read and write</td>
<td>47.6%</td>
</tr>
<tr>
<td>Read only</td>
<td>1.6%</td>
</tr>
<tr>
<td>Illiterate</td>
<td>50.4%</td>
</tr>
<tr>
<td>Not stated</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

The West Indian or Negro Population

Total Number, relative importance and sex distribution - See Table (1)

Table (7)

<table>
<thead>
<tr>
<th>Year</th>
<th>Slaves at last registration 1832</th>
<th>Slaves born locally (1) 1846</th>
<th>Increase 1832 - 1846</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>33,980</td>
<td>296,204</td>
<td>262,224</td>
</tr>
</tbody>
</table>

(1) See footnote (iii) to Table (1) Appendix A.

Increase of Negro Population (Trinidad alone)

Table (8)

<table>
<thead>
<tr>
<th>Year</th>
<th>Natives of Trinidad</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1851</td>
<td>39,913</td>
<td></td>
</tr>
<tr>
<td>1861</td>
<td>46,836</td>
<td>7,023</td>
</tr>
<tr>
<td>1871</td>
<td>56,692</td>
<td>9,756</td>
</tr>
<tr>
<td>1881</td>
<td>69,307</td>
<td>12,615</td>
</tr>
<tr>
<td>1891</td>
<td>66,941</td>
<td>17,634</td>
</tr>
<tr>
<td>1901</td>
<td>112,064</td>
<td>25,151</td>
</tr>
<tr>
<td>1911</td>
<td>240,708</td>
<td>28,664</td>
</tr>
<tr>
<td>1921</td>
<td>159,115</td>
<td>18,407</td>
</tr>
<tr>
<td>1931</td>
<td>186,162</td>
<td>27,047</td>
</tr>
<tr>
<td>1946</td>
<td>247,368</td>
<td>61,308</td>
</tr>
</tbody>
</table>

Less than half of the present population falls within the age groups 0-19 years.

Table (9)

Literacy of Negro Population

<table>
<thead>
<tr>
<th>Class</th>
<th>Percentage</th>
<th>(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read and Write</td>
<td>89.0%</td>
<td></td>
</tr>
<tr>
<td>Read only</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>9.0%</td>
<td></td>
</tr>
</tbody>
</table>

(1) See Table (6) for comparison with Indians.

All Races

Birth, Death and Infant Mortality (Trinidad and Tobago)

Table (10)

<table>
<thead>
<tr>
<th>Year</th>
<th>Birth/1000 of population</th>
<th>Deaths/1000 of Population</th>
<th>Infant Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1861(1)</td>
<td>35.22</td>
<td>32.72</td>
<td>(1) 181.0</td>
</tr>
<tr>
<td>1871</td>
<td>37.32</td>
<td>29.65</td>
<td>187.7</td>
</tr>
<tr>
<td>1901</td>
<td>35.50</td>
<td>25.00</td>
<td>129.0</td>
</tr>
<tr>
<td>1911</td>
<td>32.10</td>
<td>22.00</td>
<td>133.76</td>
</tr>
<tr>
<td>1921</td>
<td>31.10</td>
<td>19.97</td>
<td>124.1</td>
</tr>
<tr>
<td>1931</td>
<td>29.10</td>
<td>18.37</td>
<td>130.1</td>
</tr>
<tr>
<td>1946</td>
<td>38.64</td>
<td>18.37 (111)</td>
<td>76.56 (111)</td>
</tr>
</tbody>
</table>

(1) No figures available before 1881.

(11) Refers to children up to age of one year.

(iii) Annual figures from 1931 to 1946 show that this downward trend is permanent.
Conclusions

1. The population is extremely heterogenous, the West Indian negroes predominating and followed by Indians and then mixed coloured people.

2. The negroes are on the whole much better educated than Indians and this must be correlated with the urbanised life of the former.

3. Total population is increasing - the Indians reproduce faster (only a little) than the negroes.

4. For both races the rate of increase of population is rising and this is correlated with the development of better and less contra- lised medical services.

A P P E N D I X (B)

SOIL ANALYSES

<table>
<thead>
<tr>
<th>River Estate</th>
<th>Sand</th>
<th>In-</th>
<th>% Text.</th>
<th>pH (norm)</th>
<th>pH (exch)</th>
<th>Organic Matter</th>
<th>Nitrogen</th>
<th>C/N ratio</th>
<th>Avail</th>
<th>Avail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand</td>
<td>0.2&quot;</td>
<td>74</td>
<td>18</td>
<td>5.5</td>
<td>4.6</td>
<td>2.50</td>
<td>0.163</td>
<td>8.9</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>St. Augustine Loam</td>
<td>0.6&quot;</td>
<td>21.0</td>
<td>36</td>
<td>5.0</td>
<td>4.7</td>
<td>3.63</td>
<td>0.193</td>
<td>10.9</td>
<td>1</td>
<td>50-150</td>
</tr>
<tr>
<td>Guaroa Sand-Loam</td>
<td>0.6&quot;</td>
<td>38.5</td>
<td>24</td>
<td>4.7</td>
<td>4.5</td>
<td>2.26</td>
<td>0.132</td>
<td>9.9</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Brentham Sand</td>
<td>0.7&quot;</td>
<td>63</td>
<td>5.0</td>
<td>0.8</td>
<td>2.10</td>
<td>0.204</td>
<td>6.0</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rasa Clay</td>
<td>0.7&quot;</td>
<td>13.5</td>
<td>35</td>
<td>6.1</td>
<td>5.5</td>
<td>2.10</td>
<td>0.204</td>
<td>6.0</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

(1) Gives exchangeable hydrogen ions - difference between this figure and normal pH, indicates type of clay mineral in soil.

* p.p.m. - parts per million.

N.B. The figures given above should not be taken for granted for the soil types concerned. To check the variations in mineral status, three samples of St. Augustine Loam were taken within 50 yards of each other and analysed by I.C.T.A. Chemistry Dept. The result shows:

Table (2)

<table>
<thead>
<tr>
<th>St. Augustine Loam</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1.</td>
<td>0.6&quot;</td>
<td>60.7</td>
<td>10</td>
<td>6.7</td>
<td>6.2</td>
<td>1.4</td>
<td>0.12</td>
<td>6.7</td>
<td>23</td>
<td>107</td>
</tr>
<tr>
<td>Sample 2.</td>
<td>0.6&quot;</td>
<td>47.0</td>
<td>16</td>
<td>6.2</td>
<td>5.0</td>
<td>1.7</td>
<td>0.14</td>
<td>7.2</td>
<td>88</td>
<td>77</td>
</tr>
<tr>
<td>Sample 3.</td>
<td>0.6&quot;</td>
<td>28.2</td>
<td>28</td>
<td>6.0</td>
<td>5.2</td>
<td>2.9</td>
<td>0.19</td>
<td>9.0</td>
<td>12</td>
<td>116</td>
</tr>
</tbody>
</table>

The same was done for River Estate Sand, with the following results:

Table (3)

<table>
<thead>
<tr>
<th>River Estate Sand</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample 1.</td>
<td>0.6&quot;</td>
<td>67</td>
<td>13</td>
<td>6.7</td>
<td>6.2</td>
<td>2.9</td>
<td>0.17</td>
<td>9.6</td>
</tr>
<tr>
<td>Sample 2.</td>
<td>0.6&quot;</td>
<td>69</td>
<td>10</td>
<td>6.4</td>
<td>6.0</td>
<td>2.8</td>
<td>0.18</td>
<td>9.0</td>
</tr>
<tr>
<td>Sample 3.</td>
<td>0.6&quot;</td>
<td>51</td>
<td>13</td>
<td>6.6</td>
<td>6.0</td>
<td>1.6</td>
<td>0.13</td>
<td>7.2</td>
</tr>
</tbody>
</table>

These figures show the tremendous variation in these soils. Admittedly they are probably the most varied of soils in the area. The figures show that if the effect of a policy on soil fertility is to be gauged, an extremely large number of samples will be required to be analyzed.
APPENDIX (V).

Cane-Farming in Trinidad (i).

Political Background.

Factors leading up to the rapid increase in cane-farming after 1917 are briefly described in Part One. Tenure of cane farms is exemplified by conditions at Orange Grove—see Part Four, Section 2. The great increase in production of sugar cane by small-holders from 1910 to 1920 brought with it a great many problems. The first and most important of these arose from abuses consequent upon the giving of advances by manufacturers to peasant growers on the security of their crop. This suited the cane farmers because the bulk of their income came during a very short period of the year. From the manufacturers' point of view it presumably meant that the farmer became obliged to sell his cane, for which there was a keen competitive demand, to the holder of the "advance note" who was usually a manufacturer of sugar.

The cane-farmers however, exploited the position by getting several advances on the same crop under different names, from perhaps several factories, and then selling the cane to an entirely different manufacturer. The 1913 "Cane-Farmers' Advances" Ordinance was designed to prevent the manufacturers from such happenings but with little effect. The most important clause bound the cane-farmer to sell the amount of cane subject to the advance note, to the lender; or if sold elsewhere, that the holder of the advance note could claim payment from the buyer before anything was paid to the grower. The cane-farmers ingeniously overcame this by a series of aliases.

The abuses were brought under control about 1922 when the factory owners agreed to buy cane only from cane-farmers within a specified area and competition between estates for farmers' cane ceased. Individual cane-farmers felt that they were thus at the mercy of the one estate with which they were compelled to deal. A great deal of discontent arose over this state of affairs and when prices fell suddenly about the same time, many of the erstwhile cane-farmers discontinued cane production. The number of cane-farmers fell from 300,000 in 1921, to 186,000 in 1925. Since the farmers were lower cost producers than the estates themselves, the latter stood to lose by a decline in the number of cane-farmers because they profited from grinding their cane. The manufacturers therefore agreed to give what amounted to a guaranteed minimum price of $2.68 per ton and the price has never since gone below this figure.

One grievance of the cane-farmers was the absence of compensation for standing crops and capital improvements on quittance of a rented holding. This was adjusted by the "Sugar Cane Small Holdings Ordinance" of 1926. Any tenant could now harvest the plant crop, first and second rattoons and any other crops planted before notice was given to quit. Compensation for buildings could also be claimed (ii). Tenants must be given at least three months notice.

But the dissatisfaction among the cane-farmers and labourers did not settle down for a number of reasons which taken altogether had profound effects. They culminated in the riots of 1937 which led to the "Cane Farming Control Ordinance" of the same year—it was amended in 1939, 1943, and was embodied in the Production of Sugar Cane Ordinance of 1944 (amended 1946). In 1938 when export restrictions were placed on the industry, the Cane Farming Control Ordinance aimed at stereotyping the balance (which had existed up till then), between estate produced and peasant produced cane. There was the danger that the export quota of sugar would be filled by estate produced cane alone and that cane-farming would cease. For many reasons this result would be highly undesirable and to prevent it happening this ordinance provided that all farmers desirous of producing cane, must enter into a contract with a manufacturer to supply a given amount of cane. The farmer cannot be charged with breach of contract if factors outside his control prevent him from fulfilling. The manufacturers are permitted but not bound to accept more cane that is contracted for, but cannot refuse to enter into a contract with a farmer who has sold cane to him in two consecutive previous years. In actual fact however, the export quota was soon removed owing to the outbreak of war and it seems likely that restrictions will not be re-introduced for several years at least. The main limiting factor in export of sugar in the immediate future will probably be factory capacity.

(i) The term "Cane-Farmer" is applied to the peasant growers with usually 5 or rarely up to 50 acres. All the land is not planted with cane usually.

(ii) Settled by a magistrate who may appoint a valuator.

With the estates becoming more and more efficient, the same problem will arise—i.e., except for the three estates depending entirely on farmers' cane, it looks as if the estates will sooner or later be in a position to keep their factories working to capacity with estate grown cane alone; and once again the cane farmers are in danger of being squeezed out. The first step in this direction is for estates to resume land themselves for cane production. By bringing more estate海淀 cane to the factories, this will weaken the position of cane farmers producing cane.
on land of their own. This trend has already begun. In some quarters, the Cane Farming Control Ordinance is interpreted as meaning that the ratio of estate produced cane to peasant produced cane is fixed at the ratio obtaining in 1938. This is obviously unsound because it would mean that if the cane farmers chose to reduce their acreage of cane, that thousands of tons of estate grown cane would of necessity be left uncut so that the ratio would conform to requirements.

The same ordinance brought the price of sugar cane, paid to the cane farmer, under government control. It is adjusted annually on a sliding scale in accordance with the export price of sugar. The cane farming control ordinance also provided for the setting up of a Cane Farming Board which settles disputes arising between cane farmers and sugar manufacturers.

Effects of the Wage

Supplies of fertilizers and machinery were cut off; construction of the American Bases left the sugar industry with little and very inefficient labour. In 1943 the estates were only able to plant 30% of the normal planting. To encourage re-planting on a larger scale both by cane farmers and estates, a subsidy of $10.00 per acre was suggested. This figure increased to $40.00 and was ratified by Government. In 1943 the subsidy led to a replanting of 10% of the area under estate cane and farmers carried out their first appreciable planting since 1937. 5,600 acres were replanted and is estimated to be double the replanting which would have taken place without the subsidy. Replantings were greater in 1944 for both estates and farmers, and in 1945 when the subsidy was reduced to $20.00/acre, replantings by estates rose further but replantings by farmers was less than for 1944.

Payment of Subsidy to Cane Producers (1)

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount paid to Cane Farmers</th>
<th>Amount paid to Estates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1943</td>
<td>$ 78,921.00</td>
<td>$ 125,224.00</td>
</tr>
<tr>
<td>1944</td>
<td>$ 291,276.00</td>
<td>$ 308,319.00</td>
</tr>
<tr>
<td>1945</td>
<td>$ 112,601.00 *</td>
<td>$ 202,654.00 *</td>
</tr>
</tbody>
</table>

(1) The area under farmers cane has been estimated as follows:

1942 - 22,000 acres
1943 - 24,000 "
1944 - 31,400 "
1945 - 37,000 "

* Subsidy reduced to $20.00 per acre.

Although labour was still scarce and expensive in 1945, 73,000 acres of cane were grown, i.e. less than 10,000 acres short of the area computed to be under cane in 1939. Subsidisation therefore helped the sugar industry through a grave crisis. For estates the effect has been permanent but for cane farmers, replantings of cane fell away rapidly as soon as the subsidy was removed. The effects of the replantings under the subsidy scheme will have just about been exhausted next year and figures for production and replantings will undoubtedly show a downward trend.

The declining interest of peasant growers in cane production is due to:

(1) Profitability of growing food crops, etc.

(2) Resumption of land by estates which was previously rented out to cane farmers. The reason behind this is the one which will sooner or later remove most of the cane farmers, viz. that estate methods are now much more efficient, or potentially much more efficient than peasant methods.

(3) In some cases, e.g. St. Augustine, cane farming areas are becoming building areas and squeezing cane out.

Table shows that farmers’ cane, as a percentage of the total cane grown in Trinidad, reached a maximum about in 1921 of 56%, and then fell to about 42% where it remained fairly stable until 1936. The percentage fell sharply again in 1939-40 and the subsequent increase in 1941 and 1942 were probably due partly to seasonal conditions and partly to propagandising of cane farmers. 1943, '44 and '45 represent years in which a subsidy was given for replanting and an important trend is the growing of a good number of cane farmers but decreasing production. This shows, i.e. decreasing numbers of cane farmers but increasing production. It is probably that there is a tendency for the size of cane farming to be increased by amalgamation, thereby permitting the use of machinery and resulting in better yields. This process would appear to be the only way in which the cane farming industry can survive.

(1) From unpublished data obtained from Dr. F.J. Pound, Trinidad Department of Agriculture.
Efficiency of the Cane Farmers

The production per head of cane farmers has not been a stationary figure. Table shows haphazard looking variations from year to year but this is undoubtedly a seasonal effect. There is however, a general trend upwards from 15 tons head/annum in the early 1900's to about 35 tons in 1936. This figure does not vary much after 1928 until 1944 and 1946 when the production per head fell to about 25 tons/head. Bad seasons, severe frog-hopper attack and the war-time shortage of artificial fertilisers is probably responsible for this. In 1948, the figure had risen again to 37 tons/head.

Assuming that the average area maintained by a farmer has not increased steadily year by year, these figures mean that in spite of the lack of deliberate teaching and advice, the peasant farmers almost trebled their production per head from 16.5 tons/head in 1930 to 41 tons/head in 1941 i.e. in just over 10 years.

Notwithstanding these observations, the fate of cane-farmers was sealed in 1936. Hitherto, when the yields obtained by the estates fell, so also did those of the cane farmers. Both reacted the same way to seasonal variations; but in 1936, though the yield of cane from farmers fell by about 50% of their previous year's crop, estate grown cane rose by about 6% of their previous year's crop. Here was mechanisation ! It is true that from 1938 to 1939 the number of cane farmers fell from 15,465 to 12,914; a reduction of 17%. However the same sort of thing happened in 1958. The war has just prolonged the life of cane farmers to some extent, i.e. on their system of working.

The Sugar Cane Farming Population

In 1900, a good 60% of the cane farmers were West Indians (Negroes) as distinct from Indians (East Indian descent). This figure has decreased steadily to about 20% at the present time. In the Statham "edge area, the cane farmers are almost entirely Indian. Only a few West Indians are present. The total number of cane farmers has decreased over the last ten years thus accounting partly for the loss important role of peasant produced cane. Both Indians and West Indians have fallen off in numbers but the latter have decreased both absolutely and relatively.

Price Production Relationships

(1) "The proportion of the total cane supplied by cane farmers tends to increase with rising, and decrease with falling prices of cane. This effect is not immediately reflected in the farmer's output since at least 12 months elapse between planting and the first reaping and then the raottos are cut for another two or more years". The full effect of a change in price may be lagged for 2 or 3 years. At the present time, owing to inflated money values, it is impossible to draw conclusions about the price/production relationship without weighing prices according to the purchasing power of the money.

(1) From "Agricultural Labour in Trinidad" by Prof. C. Y. Shephard.
## Table (1)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Tons of Cane ground</th>
<th>Farmers cane as percentage to total cane grown</th>
<th>Number of Cane farmers</th>
<th>Production per individual farmer (tons)</th>
<th>Negroes as percentage of total no. of cane farmers</th>
<th>Total Sugar production Estations plus Farmers (tons)</th>
<th>Price paid for Farmers' cane ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1907</td>
<td>248,506</td>
<td>27</td>
<td>4,018</td>
<td>17</td>
<td>52</td>
<td>53,174</td>
<td></td>
</tr>
<tr>
<td>1908-1910</td>
<td>313,400</td>
<td>41</td>
<td>14,595</td>
<td>15</td>
<td>43</td>
<td>55,333</td>
<td></td>
</tr>
<tr>
<td>1911-1912</td>
<td>250,200</td>
<td>55</td>
<td>20,965</td>
<td>14</td>
<td>41</td>
<td>55,239</td>
<td>4.25</td>
</tr>
<tr>
<td>1913-1914</td>
<td>565,600</td>
<td>41</td>
<td>17,237</td>
<td>22</td>
<td>35</td>
<td>96,225</td>
<td>2.89</td>
</tr>
<tr>
<td>1915-1916</td>
<td>556,840</td>
<td>40</td>
<td>15,457</td>
<td>24</td>
<td>32</td>
<td>105,343</td>
<td>2.64</td>
</tr>
<tr>
<td>1917-1918</td>
<td>603,556</td>
<td>40</td>
<td>18,062</td>
<td>22</td>
<td>32</td>
<td>117,780</td>
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</tr>
<tr>
<td>1919-1920</td>
<td>505,113</td>
<td>43</td>
<td>19,471</td>
<td>30</td>
<td>32</td>
<td>154,665</td>
<td>2.64</td>
</tr>
<tr>
<td>1921-1922</td>
<td>813,029</td>
<td>44</td>
<td>30,705</td>
<td>30</td>
<td>33</td>
<td>154,265</td>
<td>2.64</td>
</tr>
<tr>
<td>1923-1924</td>
<td>719,115</td>
<td>43</td>
<td>15,485</td>
<td>37</td>
<td>27</td>
<td>133,627</td>
<td>2.64</td>
</tr>
<tr>
<td>1925-1926</td>
<td>759,520</td>
<td>34</td>
<td>12,914</td>
<td>30</td>
<td>27</td>
<td>128,522</td>
<td>2.64</td>
</tr>
<tr>
<td>1927-1928</td>
<td>506,616</td>
<td>36</td>
<td>11,247</td>
<td>26</td>
<td>27</td>
<td>92,256</td>
<td>3.35</td>
</tr>
<tr>
<td>1929-1930</td>
<td>684,775</td>
<td>44</td>
<td>12,642</td>
<td>41</td>
<td>25</td>
<td>131,671</td>
<td>3.73</td>
</tr>
<tr>
<td>1931-1932</td>
<td>535,849</td>
<td>46</td>
<td>13,058</td>
<td>34</td>
<td>23</td>
<td>104,429</td>
<td>4.50</td>
</tr>
<tr>
<td>1933-1934</td>
<td>383,971</td>
<td>46</td>
<td>10,495</td>
<td>32</td>
<td>21</td>
<td>70,875</td>
<td>4.50</td>
</tr>
<tr>
<td>1935-1936</td>
<td>460,866</td>
<td>33</td>
<td>9,299</td>
<td>25</td>
<td>21</td>
<td>76,262</td>
<td>5.50</td>
</tr>
<tr>
<td>1937-1938</td>
<td>490,445</td>
<td>32</td>
<td>8,305</td>
<td>28</td>
<td>22</td>
<td>76,347</td>
<td>5.84</td>
</tr>
<tr>
<td>1939-1940</td>
<td>652,655</td>
<td>35</td>
<td>6,441</td>
<td>37</td>
<td>20</td>
<td>109,603</td>
<td>6.77</td>
</tr>
</tbody>
</table>

* Approximate figure

(i) 16.5 in 1930.

(ii) Rose to $8.40 in 1920.

(iii) In spite of stable prices from 1934 to 1939, the number of cane farmers increased from 15,437 to 20,705 in 1937 and then fell to 12,914 in 1939.

(iv) Subsidy of $40.00/acre in 1943-44 and $20.00/acre in 1955 given to encourage replanting.

(v) These falling numbers do represent a definite trend Dr. F. J. Found found that even though the figures were fictitiously high due to trickery in order that as many as possible might claim the subsidy. Excluding those growing cane on "scrub" land without giving it any attention but simply reaping an extremely poor crop, Dr. Found puts the number of cane farmers in 1943 at less than 5,000 and at $5,480 in 1945.
Varieties of Rice Grown in St. Augustine-Stratham Lodge Area

(1) **Joyah** - two strains, Joyah(1) and Joyah(2). Husks are white enclosing long white grains. A good milling rice but with a weak straw and slight tendency to lodge. It is an early maturer and a fair tillering capacity - very popular. Joyah(2) has a shorter plumper grain and slightly lower yield but is otherwise similar to Joyah(1).

(2) **Demerara Red** - A brown husk encloses a long red grain. This is a strong-stawed type and slightly later maturing than Joyah. It is the highest yielder but requires a plentiful and regular supply of water.

(3) **Jarrahan** - a most attractive variety in ear due to the golden yellow to a very light brown husk. The grain is long and white. It is a higher yielder and late maturing. Takes over 5 months to mature and is a month later than Joyah.

(4) **Sahadeyah** - Light brown husks enclose grain which are shorter and plumper than Joyah and which have a pinkish tinge. Slightly later than Joyah but still an early variety.

(5) **Many other Varieties** each having some particular feature for which it is grown are:

- Mootmoorie, Demerara white, Baijaibong, Kallaman, Dinjatia & Joceya.
- Black rice is regarded as a weed. It has black to purple husks with a red grain. It is very early maturing and sheds the grain before harvesting.

Most of these varieties are being tested by the Department of Agriculture.
APPENDIX (E)

Organisation of Agricultural Extension - Trinidad Department of agriculture

The organisation is only a recent advance and represents an attempt to weld into one coherent body, the previously existing Plant Protection officers Inspectors of various kinds, personnel temporarily employed to administer the Gene planting Subsidy and Food Production drive during the War, and agricultural assistants who received a minimum of training at a Cocoa Research Station. These were formerly responsible for cocoa growing in certain districts.

Relationship of Extension Units to Political Administrative Units

Trinidad is divided up into eight counties but two, Mariva and Mayaro are usually taken together so actually there are seven - St. Patrick, Mariva-Mayaro, Victoria, Gerroa, St. Andrew, St. George and St. David. Each one is divided into Wards which form the political administrative run by the county Warden with Assistant Wardens and Ward Officers who are comparable to the Field Assistants in the Agricultural Extension Service. Here are exceptions to this set-up:

They are a ward at Sangre Grande responsible for both St. David and Mariva-Mayaro although both counties have an assistant warden. In county Gerona, the Warden is stationed at Couva and has an assistant warden at Ochoa early in the same county. In the south there is a warden at San Fernando responsible for Victoria and St. Patrick. He has three assistant wardens - one at Prince Town (Victoria), one at Siparia (St. Patrick) and one at La Brea (St. Patrick). In county St. George which includes the area being surveyed, there is a Warden at Port of Spain, an assistant warden at Tunapuna and an assistant at Arima. The later is answerable to the Assistant Warden at Tunapuna in the first instance.

County boundaries were mapped without regard to roads, topography or local conditions and in establishing an extension service on a county basis, adjustments have been to the extent that county boundaries will be followed if local conditions demand it.

For extension Services, Trinidad is divided into two regions by a line running from Claxton Bay to Manzanilla. Tobago constitutes the third region. One of these is responsibility of an "Agricultural Officer" who delegates the responsibility to Senior Agricultural Assistants in each County. Where the problems are less difficult, Agricultural assistants are used in place of Senior agricultural Assistants e.g. Counties of St. David and Mariva-Mayaro. The bulk of the field staff consists of "Field Assistants" in two grades. Some of these (Grades 11 ones) are answerable to Grade 1 field assistants and others are answerable direct to the Senior Agricultural Officer. Apart from those with special duties on district stations, these field assistants operate within certain districts sometimes roughly equal to a ward but usually a smaller area.

Staff Duties

The duties of the "Agricultural Officer" are hard to define but include such things as organisation of his division, tackle unusual or special problems which arise, keep an eye on school gardens, maintain contact with Wardens, other rural departments and sugar companies etc., collecting information and dispersing of information between junior staff and H.Q., attend to emergency work until it can be passed on to Agricultural Assistants or Field Assistants.

The duties of the County "Agricultural Assistants" is also a local matter and to some extent will consist of executing directives from the Agricultural Officer through the Field Assistants. The things which the agricultural assistants become responsible for are:

1. To visit and report on areas where cocoa is being replanted.
2. To visit and report rehabilitation of existing plots with the help of Government Funds.
3. Carrying out special demonstrations in their Counties.
4. To guide and advise selected school gardens.
5. To guide and advise on Health Centre gardens and other demonstration plots in their Counties.
6. Collecting Breeding Unit data and disseminating data for follow-up work with progeny.
(7) Investigating programmes for renting of parcels of land applied for by ex-service-men and others.

(8) Preparing miscellaneous reports on loans to ex servicemen dealing with complaints, reports of new outbreaks of disease etc.,

(9) Supervision of County Demonstration Stations where they exist (1).

When this work becomes stereotyped, it is passed on to the Field Assistants leaving Agricultural assistants freer to organise demonstrations, assist in club competitions and give talks to groups of progressive farmers. The field assistants are required to know every property and every proprietor personally and form the real contacts between private individuals and the Department of Agriculture. They are, at present, carrying out a crop survey which will help them in this matter as well as providing information on which policy can be based. In actual fact, the lack of knowledge and inexperience of the field assistants is putting a tight break on the whole extension programme. Gradually, the better ones are gaining useful experience and more knowledgeable assistants are being taken on so that in the course of time the above more or less theoretical requirements will find expression in practice.

The Institutional Set-Up in the Extension Service.

The idea is to have a Central Experiment Station at Centeno with satellite stations at Sangre Grande (for St. Andrew), Rio Claro (for Nariva-Mayaro), one in Tobago, and one in each of Caroni, Victoria and St. Patrick. These would be a break-down from these County Stations on to Demonstrative Units on land settlements and Breeding Units. There was also to have been a staff training college at Centeno for which costly buildings were erected and an Expert (Mr. Chaudry, formerly of Kenya) was imported; but the less said about its unfortunate fate, the better. The Central Experiment Station at Centeno is moving along and subsidiary institutions have been established as follows:

- Experimental Stations at El Recuerdo (St. Andrew), Louis D’or (Tobago) and Rio Claro (Nariva-Mayaro).
- Breeding Units - El Recuerdo (St. Andrew), Baraso (Caroni), La Juna (Victoria), San Pedro (Nariva-Mayaro), Macurepo (St. George), Demonstrative Stations at Biche (Nariva-Mayaro), La Pastora (St. George), Brooklyn (St. Andrew).

Once again, the activities of these institutions will be unsatisfactory until a properly trained staff can be obtained.

Basis for Livestock Work.

In each of the three main regions, there is a Veterinary Officer who liaises with the Agricultural Officer. The Veterinary Officer has the assistance of Livestock Inspector who concentrate on animal husbandry work in defined counties. There is a livestock station in Tobago as well as the Government Stock Farm in Trinidad. The latter experiments with breeding and management, makes servicing and castrating facilities available and produces milk for Government institutions such as hospitals and schools.

It is present policy to think about setting up milk collecting or "separating" depots where the demand arises, e.g. Depots at Penal and one near Hanover are being contemplated. The idea is that either the milk will be collected, pasteurised and distributed in urban areas, or the cream will be removed, taken to the Government Stock Farm for manufacture into butter or cheese and the skim milk is returned to the producer for children or young stock. It is felt rather than awaiting the demand for them by any populated groups, that these stations could be a most effective instrument to actually encourage livestock keeping, particularly dairy cows.

Special Officers in the Extension Service.

Chief Plant Protection Officer is equivalent to an Agricultural Assistant and has a small staff of field assistants who may be termed Cane Farmers Survey Officer or Cane Kassic Inspector. Work is carried out under the supervision of the Plant Pathologist and Entomologist in connection with control of pests and diseases.

The land settlement Supervisor is the specialist officer who provides the link with the special committee who control organised land settlement schemes where roads, water and social amenities skin to village life are provided for the tenants as opposed to the settlement of agricultural properties for the purpose of food production or of providing small rural homesteads for budding proprietors". (1).

---

(1) Nos.1 to 9 copied from article by Dr. F.J. Poud - "Proceedings of the Agricultural Society of Trinidad & Tobago, December 1946".
N.B.  
Senior Staff of Trinidad Department of Agriculture

**Director:** Mr. E. W. Leach

**Deputy Director:** Dr. F. J. Pound - Crop Husbandry (60 personnel)

**Deputy Director:** Capt. H. V. M. Motivier - Veterinary Section and Stock Farms (8 personnel)

**Chief Scientific Officer:** Dr. E. Phyllis

**Senior Agricultural Officer:** vacant - (Mr. E. Benson Acting)

**Marketing Officer:** vacant.

**Regional Agricultural Officers:**

- **North:** Mr. G. P. Blair
- **South:** Mr. E. G. Benson
- **Trinidad:** Mr. F. D. Davis

**Scientific Staff:**
- Entomologist: Mr. R. G. Fennah. (Temporary Secondment)
- Plant Pathologist and Soil Chemist: vacant.

**Soil Survey Officers:** Mr. Witt and Mr. Constable.

**Sugar Agronomist:** Citrus Agronomist (including coconuts): vacant.

**Cocoa Agronomist:** Mr. B. G. Bontserin.

**Economic Botanist:** Mr. D. W. Murray.

**Veterinary Officers:** Dr. Des-Iles and Mr. Hall.

The Department has propagating facilities at King's Bay in Tobago, at La Pastora and at the St. Augustine Nurseries. (Manager of the latter is Mr. R. E. Dean).  
Manager of the Government Stock Farm is Mr. A. P. Nibbitts.

* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

**APPENDIX (F)**

Compare the figures given below with those applying to Field Work (See Part Four - Labouring and Wage Earning)

### Factory Work

#### Table 2

<table>
<thead>
<tr>
<th>Class</th>
<th>No. of Days worked</th>
<th>Adults</th>
<th>Young</th>
<th>Total</th>
<th>% of total</th>
<th>Adults</th>
<th>Young</th>
<th>Total</th>
<th>% of total</th>
<th>Adults</th>
<th>Young</th>
<th>Total</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Persons</td>
<td></td>
<td></td>
<td></td>
<td>Persons</td>
<td></td>
<td></td>
<td></td>
<td>Persons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 days</td>
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<td>7.51</td>
<td>7.69</td>
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<td>22.15</td>
<td>329</td>
<td>310</td>
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<td>329</td>
<td>329</td>
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<tr>
<td>205-233</td>
<td>&quot;</td>
<td>2.67</td>
<td>5.13</td>
<td>7.80</td>
<td>5.32</td>
<td>8.96</td>
<td>5.36</td>
<td>221</td>
<td>220</td>
<td>221</td>
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<td>221</td>
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<tr>
<td>155-207</td>
<td>&quot;</td>
<td>2.68</td>
<td>2.56</td>
<td>5.24</td>
<td>4.37</td>
<td>4.02</td>
<td>4.37</td>
<td>196</td>
<td>197</td>
<td>196</td>
<td>196</td>
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<tr>
<td>156-161</td>
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<td>2.56</td>
<td>5.43</td>
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<td>3.80</td>
<td>4.31</td>
<td>167</td>
<td>166</td>
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<td>168</td>
<td>168</td>
<td>168</td>
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<tr>
<td>156 &quot;</td>
<td></td>
<td>71.44</td>
<td>71.80</td>
<td>71.44</td>
<td>31.87</td>
<td>42.23</td>
<td>32.00</td>
<td>50</td>
<td>74</td>
<td>50</td>
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</tbody>
</table>

These corresponding tables giving comparative information regarding factory work are of no importance to the survey area directly because West Indians for the most part predominate in this sphere of activity. Nevertheless, it is recognised that the Indians are showing an increasing tendency to infiltrate into the factories.

### Table 3

#### Number of Female employees and Man-days worked

<table>
<thead>
<tr>
<th>Class</th>
<th>No. Employed as %</th>
<th>Man-days worked as %</th>
<th>Man-days worked per person</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>of total</td>
<td>of total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adults</td>
<td>Young</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>Persons</td>
<td>Persons</td>
<td></td>
</tr>
<tr>
<td>300 days</td>
<td></td>
<td>4.48</td>
<td>4.57</td>
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<td>260-299</td>
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<td>4.23</td>
<td>4.91</td>
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<td>234-259</td>
<td>&quot;</td>
<td>3.12</td>
<td>3.12</td>
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<td>205-233</td>
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<td>2.69</td>
<td>2.68</td>
</tr>
<tr>
<td>156-181</td>
<td>&quot;</td>
<td>6.28</td>
<td>6.25</td>
</tr>
<tr>
<td>156 &quot;</td>
<td></td>
<td>74.44</td>
<td>72.55</td>
</tr>
</tbody>
</table>

#### Wages earned / person / man-day

<table>
<thead>
<tr>
<th>Class</th>
<th>No. days worked</th>
<th>Adults</th>
<th>Young</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Persons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 days</td>
<td></td>
<td>1.66</td>
<td>0.79</td>
<td>2.45</td>
</tr>
<tr>
<td>260-299</td>
<td>&quot;</td>
<td>1.69</td>
<td>0.66</td>
<td>2.35</td>
</tr>
<tr>
<td>234-259</td>
<td>&quot;</td>
<td>1.60</td>
<td>0.93</td>
<td>2.53</td>
</tr>
<tr>
<td>205-233</td>
<td>&quot;</td>
<td>1.62</td>
<td>1.14</td>
<td>2.76</td>
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<tr>
<td>155-207</td>
<td>&quot;</td>
<td>1.55</td>
<td>0.88</td>
<td>2.43</td>
</tr>
<tr>
<td>156-181</td>
<td>&quot;</td>
<td>1.49</td>
<td>0.90</td>
<td>2.39</td>
</tr>
<tr>
<td>156 days</td>
<td>&quot;</td>
<td>1.44</td>
<td>0.94</td>
<td>2.38</td>
</tr>
</tbody>
</table>

### Table 4

An interesting point is that although the factory work only for four months in a year, and cultivation work continues throughout the whole of the year, that a significantly higher proportion of the total number of factory workers are employed for more than 250 days in the year. At the same time the same feature of a high percentage of the total number employed working for a relatively very short period (see group working for less than 156 days) is observable, i.e. 73% male employees and 81% women (see table 4). 73% of total man-days worked by men, 81% of total man-days worked by women.

Another interesting feature of this facory labour is that the wages are significantly higher per man-day than the wages paid per man-day for work in the fields.
Further Statistics Relating to the Activities of the Agricultural Credit Societies - Trinidad and Tobago 1947

### Loans to Societies

**Summary Societies’ Loan Accounts in $’s (B.W.I.)**

<table>
<thead>
<tr>
<th></th>
<th>Agriculture Credit Bank</th>
<th></th>
<th>Usine Ste. Madeleine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trinidad</td>
<td>Tobago</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Owed by Societies 1/7/46</td>
<td>36,556</td>
<td>7,486</td>
<td>44,042</td>
<td>676</td>
</tr>
<tr>
<td>New loans contracted</td>
<td>213,055</td>
<td>35,723</td>
<td>248,778</td>
<td>84,125</td>
</tr>
<tr>
<td>Interest accrued</td>
<td>5,025</td>
<td>818</td>
<td>5,843</td>
<td>1,508</td>
</tr>
<tr>
<td>Repayments</td>
<td>202,973</td>
<td>40,162</td>
<td>243,135</td>
<td>74,442</td>
</tr>
<tr>
<td>Owed by Societies 30/6/47</td>
<td>52,014</td>
<td>3,864</td>
<td>55,877</td>
<td>11,867</td>
</tr>
</tbody>
</table>

### Loans to Members

**Summary Members’ Loan Accounts in $’s (B.W.I.)**

<table>
<thead>
<tr>
<th></th>
<th>Agriculture Credit Bank</th>
<th></th>
<th>Usine Ste. Madeleine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trinidad</td>
<td>Tobago</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Owed by Members 1/7/46</td>
<td>29,375</td>
<td>7,836</td>
<td>37,211</td>
<td>16,259</td>
</tr>
<tr>
<td>New loans contracted</td>
<td>211,495</td>
<td>35,630</td>
<td>247,125</td>
<td>116,680</td>
</tr>
<tr>
<td>Interest accrued</td>
<td>11,711</td>
<td>1,517</td>
<td>13,228</td>
<td>4,329</td>
</tr>
<tr>
<td>Repayments</td>
<td>208,778</td>
<td>40,737</td>
<td>249,515</td>
<td>99,926</td>
</tr>
<tr>
<td>Owed by Members 30/6/47</td>
<td>44,103</td>
<td>4,246</td>
<td>48,350</td>
<td>37,642</td>
</tr>
</tbody>
</table>

These tables show:

1. That repayments greatly exceed the interest accruing, i.e. both interest and capital are being repaid satisfactorily both by members to Societies and Societies to the Agricultural Bank.
2. The difference between total repayments by members to Societies and Societies to the Bank ($31,663) shows that the reserve funds of the Societies are increasing. (Actually some Societies are nearly self-supporting while others have very small reserve funds).
3. The magnitude of new loans contracted shows that the Societies are gaining in support from members.

### Purpose of Loans

**Summary**

<table>
<thead>
<tr>
<th></th>
<th>$’s (B.W.I.) 1947</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Crops</td>
<td>Trinidad</td>
</tr>
<tr>
<td></td>
<td>Tobago</td>
</tr>
<tr>
<td></td>
<td>Usine Ste. Madeleine</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>118,620</td>
</tr>
<tr>
<td>Sugar Cane</td>
<td>69,725</td>
</tr>
<tr>
<td>Other Crops</td>
<td>16,130</td>
</tr>
<tr>
<td>Stock</td>
<td>44,865</td>
</tr>
<tr>
<td>Buildings</td>
<td>46,320</td>
</tr>
<tr>
<td>Fixtures</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td>293,930</td>
</tr>
</tbody>
</table>

### Cost of Running the Societies

1947

**Agricultural Credit Bank**  Av. $29.04/Society/annum ($1.07 per $100 borrowed)

**Usine Ste. Madeleine**  Av. $3.73/Society/annum ($0.08 per $100 borrowed).

The cheapness of Usine Societies is due to the fact that there are no travelling expenses to draw and repay loans.

### Resources of the Societies

Societies’ resources comprise Reserve Funds and the accumulated balances of their profit and loss accounts.

<table>
<thead>
<tr>
<th></th>
<th>Agric. Bank</th>
<th>Usine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additions during 1947</td>
<td>5,685</td>
<td>2,931</td>
<td>8,617</td>
</tr>
<tr>
<td>Total at end of 1947</td>
<td>25,770</td>
<td>41,402</td>
<td>67,172</td>
</tr>
</tbody>
</table>
APPENDIX (G) Cont.

Interest Charged

Agricultural Credit Bank charges societies .................. 3 %
Societies other than Usino charge members .................. 7 %
Usino Sto. Madeleine Sugar Co. charges societies ............ 4 %
Usino societies charge members .................................. 6 - 10 %

***

APPENDIX (H)


The following figures relate to retail and wholesale prices and scarcity or abundance at Tunapuna Market from May 1947 to May 1948. The information is quoted with the permission of Mr. Lucio-Smith, Acting Chief of the Marketing Division and Control Board.

Abundance or Scarcity is represented by figures 1 to 5:

1 = abundant
2 = plentiful
3 = satisfactory
4 = fair
5 = scarce

Column (a)

Prices are quoted in cents:

Wholesale price .... Column (b)
Retail price ....... Column (c)

Figures represent market conditions at the end of the 1st week of each month. Prices are usually x $ per lb but with corn cobs and some fruits, sale is by number and not weight.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
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<tr>
<td>15</td>
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<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
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<td>16</td>
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<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
<td>2/3</td>
</tr>
</tbody>
</table>

(i) 5/2/12 in subsequent week

(ii) 2/1-1/1/12 in subsequent week
## 2. Schedule Prices for Agricultural Produce 1948

**Table (2)**

**Price of Goods (Amendment No. 22) Regulations, 1948**

<table>
<thead>
<tr>
<th>Articles</th>
<th>Unit</th>
<th>Wholesale</th>
<th>Retail throughout the Colony</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Within recognised Markets or registered wholesale and retail shops</td>
<td>Elsewhere</td>
</tr>
<tr>
<td><strong>Bananas - All kinds, Without stems</strong> per lb.</td>
<td></td>
<td>3¢</td>
<td>2¢</td>
</tr>
<tr>
<td><strong>Beans, Green - All kinds</strong></td>
<td>do</td>
<td>10¢</td>
<td>8¢</td>
</tr>
<tr>
<td><strong>Corn - (i) Fresh green cobs</strong> per cobb</td>
<td>do</td>
<td>2¢</td>
<td>2¢</td>
</tr>
<tr>
<td><strong>(ii) Boiled or Roast cobs</strong> do</td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>(iii) Dry shelled grain</strong> per lb.</td>
<td>do</td>
<td>4¢</td>
<td>4¢</td>
</tr>
<tr>
<td><strong>(iv) Dry cobs</strong> per cobb</td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>(v) Dry shelled</strong> per barrel</td>
<td>do</td>
<td>$3.10</td>
<td>$3.00</td>
</tr>
<tr>
<td><strong>(vi) Crushed</strong> per lb.</td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Eggs - Local (other than for breeding)</strong> per doz.</td>
<td>do</td>
<td>78¢</td>
<td>72¢</td>
</tr>
<tr>
<td><strong>Grapefruit</strong></td>
<td>per 100</td>
<td>$1.75</td>
<td>$1.50</td>
</tr>
<tr>
<td><strong>Do</strong></td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Lettuce - (i) Heads weighing not more than 2 oz.</strong> per head</td>
<td>do</td>
<td>3¢</td>
<td>2¢</td>
</tr>
<tr>
<td><strong>(ii) Heads weighing over 2 oz. but not more do</strong></td>
<td>do</td>
<td>4¢</td>
<td>3¢</td>
</tr>
<tr>
<td><strong>(iii) Heads weighing over 3 oz.</strong> do</td>
<td>do</td>
<td>6¢</td>
<td>4¢</td>
</tr>
<tr>
<td><strong>Pears - Black Eye (dry)</strong> per lb.</td>
<td>do</td>
<td>6¢</td>
<td>5¢</td>
</tr>
<tr>
<td><strong>Greens - Cub-Cub</strong></td>
<td>do</td>
<td>9¢</td>
<td>8¢</td>
</tr>
<tr>
<td><strong>Pigeon Pears, Green in pod</strong></td>
<td>do</td>
<td>6¢</td>
<td>5¢</td>
</tr>
<tr>
<td><strong>Pigeon Pears, Shelled, Green do</strong></td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Pigeon Pears, Dry</strong></td>
<td>do</td>
<td>9¢</td>
<td>8¢</td>
</tr>
<tr>
<td><strong>Platina</strong></td>
<td>do</td>
<td>5¢</td>
<td>4¢</td>
</tr>
<tr>
<td><strong>Rice (Trinidad - (i) Paddy</strong> per brl. of 160 lbs.</td>
<td>do</td>
<td>$5.40</td>
<td>-</td>
</tr>
<tr>
<td><strong>(ii) Rice</strong> per lb.</td>
<td>do</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Rice Husks</strong></td>
<td>per kerosene tin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Sweet Potatoes</strong></td>
<td>per lb.</td>
<td>3¢</td>
<td>3¢</td>
</tr>
<tr>
<td><strong>Tomatoes</strong></td>
<td>do</td>
<td>16¢</td>
<td>14¢</td>
</tr>
<tr>
<td><strong>Yams - (i) Lisbon, Portuguesa, Eboco and Renta</strong> per do</td>
<td>do</td>
<td>5¢</td>
<td>4¢</td>
</tr>
<tr>
<td><strong>(ii) Other varieties, except Cush Cush and Chinese</strong> per do</td>
<td>do</td>
<td>3¢</td>
<td>2¢</td>
</tr>
</tbody>
</table>
## Appendix (1)

### Land Utilisation in Trinidad

#### Table (1)

A Tentative Balance Sheet of Land Allocation in Trinidad.

By

Dr. E. Chenery, Soil Chemist, Department of Agriculture, T’dad.

<table>
<thead>
<tr>
<th>General Allocation of the Land</th>
<th>Square Miles</th>
<th>Total</th>
<th>Percent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Alianted land</td>
<td>924</td>
<td>49.5</td>
<td></td>
</tr>
<tr>
<td>2. Forest Reserves including proposed reserves</td>
<td>435</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>3. Crown Land Reserves including roads, rivers etc.</td>
<td>243</td>
<td>13.0</td>
<td></td>
</tr>
<tr>
<td>4. Crown Land Reserves under oil concessions</td>
<td>217</td>
<td>11.7</td>
<td></td>
</tr>
<tr>
<td>5. Other areas</td>
<td>45</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,864</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Agricultural Potentialities of the Land

**Land not available for Agriculture**

<table>
<thead>
<tr>
<th>Region</th>
<th>Locality</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Northern Rango</td>
<td>Western end above 1000 ft.</td>
<td>Slopes too steep and erosion</td>
</tr>
<tr>
<td>10. Northern Basin</td>
<td>Las Lomas</td>
<td>Bad Soil</td>
</tr>
<tr>
<td>11. Central Rango</td>
<td>Tabequito-Pipero</td>
<td>Bad Soil</td>
</tr>
<tr>
<td>12. Southern Rango</td>
<td>Cap de Villo-Chantham Oilfields</td>
<td>Bad soil</td>
</tr>
</tbody>
</table>

Alianted Land unsuitable for Agriculture

<table>
<thead>
<tr>
<th>Region</th>
<th>Locality</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Northern Rango</td>
<td>Foot-hills</td>
<td>Bad soil</td>
</tr>
<tr>
<td>14. Southern Rango</td>
<td>Swamps</td>
<td>Too salty</td>
</tr>
</tbody>
</table>

Crown Lands unsuitable for Agriculture

<table>
<thead>
<tr>
<th>Region</th>
<th>Locality</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Naperima Neriva Swamp</td>
<td>Water-logged</td>
<td></td>
</tr>
<tr>
<td>16. Southern Rango Guayaguayaro</td>
<td>Inaccessibility; poor soil and under oil concessions, 7 above</td>
<td></td>
</tr>
</tbody>
</table>

Crown Lands at present unsuitable but capable of development

<table>
<thead>
<tr>
<th>Region</th>
<th>Locality</th>
<th>Square Miles</th>
<th>Total</th>
<th>Percent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Naperima Neriva Swamp</td>
<td>38</td>
<td>38</td>
<td>2.0</td>
<td></td>
</tr>
</tbody>
</table>
Total Area unsuitable or not available for agriculture | 1,189 | 62.8
Total Area suitable for agriculture (by difference) | 675 | 37.2

**LAND GRADES OF TRINIDAD**

<table>
<thead>
<tr>
<th>Alienated Land</th>
<th>Square Miles</th>
<th>Total</th>
<th>Per cent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cacao; Productivity very high or high; (1936) Grades I &amp; II</td>
<td>87</td>
<td>9.4</td>
<td>4.7</td>
</tr>
<tr>
<td>2. Productivity medium; Grade III</td>
<td>159</td>
<td>17.2</td>
<td>8.5</td>
</tr>
<tr>
<td>3. Productivity low; Grade IV</td>
<td>35</td>
<td>3.8</td>
<td>1.9</td>
</tr>
<tr>
<td>4. Sugar Cane; high productivity</td>
<td>128</td>
<td>13.8</td>
<td>6.9</td>
</tr>
<tr>
<td>5. Coconuts; low productivity</td>
<td>63</td>
<td>6.8</td>
<td>3.4</td>
</tr>
<tr>
<td>6. Citrus; high productivity on Grade III cacao soil</td>
<td>11</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>7. Tomen Beans; high productivity on Grade IV cacao soil</td>
<td>12</td>
<td>1.2</td>
<td>0.6</td>
</tr>
<tr>
<td>8. Rice; high productivity on swampy soils (Grade V cacao soil)</td>
<td>14</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>9. Ground provisions; high to medium productivity on Grades III and IV cacao soil</td>
<td>14</td>
<td>1.5</td>
<td>0.7</td>
</tr>
<tr>
<td>10. Abandoned land, towns, roads etc. Grade IV and V</td>
<td>401 = 924</td>
<td>43.8 =100% 21.5</td>
<td></td>
</tr>
</tbody>
</table>

**Crown Lands**

<table>
<thead>
<tr>
<th>Type</th>
<th>Square Miles</th>
<th>Total</th>
<th>Per cent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. *Good Soil; Grades I and II cacao soil</td>
<td>8</td>
<td>1.7</td>
<td>0.4</td>
</tr>
<tr>
<td>12. *Medium Soil; Grade III Cacao soil</td>
<td>69</td>
<td>15.0</td>
<td>3.7</td>
</tr>
<tr>
<td>13. Land suitable for agriculture if developed (a) Nariva Swamp (rice) 38 square miles</td>
<td>146</td>
<td>32.2</td>
<td>8.0</td>
</tr>
<tr>
<td>* (b) Guayaguayare (rubber) 110 square miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Land totally unsuitable for agriculture Grade V (a) Northern Range foothills, roads etc. 205 square miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* (b) Orapoucho Logoon 10 square miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* (c) Southern Brashes 20 square miles</td>
<td>235 = 460</td>
<td>51.1 =100% 12.6</td>
<td></td>
</tr>
</tbody>
</table>

**Forest Reserves**

<table>
<thead>
<tr>
<th>Type</th>
<th>Square Miles</th>
<th>Total</th>
<th>Per cent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Good Soil; Grades I and II cacao soil in S.W.R. &amp; C.R.R.</td>
<td>10</td>
<td>2.3</td>
<td>0.6</td>
</tr>
<tr>
<td>16. Medium soil; Grade III cacao soil (a) Southern Watershed Reserve 21 sq. miles</td>
<td>59</td>
<td>13.6</td>
<td>3.2</td>
</tr>
<tr>
<td>(b) Central Range Reserve 28 sq. miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) Morrice Reserve 10 sq. miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Land unsuitable for agriculture; Grades IV and V</td>
<td>365 = 435</td>
<td>84.1 =100% 19.6</td>
<td></td>
</tr>
</tbody>
</table>

**Other Areas**

<table>
<thead>
<tr>
<th>Type</th>
<th>Square Miles</th>
<th>Total</th>
<th>Per cent of whole Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Land of low grade (Grades IV &amp; V cacao soil)</td>
<td>45</td>
<td>45</td>
<td>2.4</td>
</tr>
</tbody>
</table>

* Under Oil concessions.*

<table>
<thead>
<tr>
<th>Total</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,864</td>
<td>1,864</td>
</tr>
<tr>
<td>1.000</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Cultivation of Food Crops for Local Consumption

The maximum area under annual food crops at any one time was shown to be 54,000 acres and in addition, plantains and bananas interplanted in other cultivations would have occupied a further 7,500 acres if planted as pure stands. Thus the total maximum area under cultivation at any one time in 1944 was equivalent to rather more than 60,000 acres. In 1936, the area devoted to food crops other than bananas was estimated to be 20,000 acres, but it had fallen to about 15,000 acres by the end of 1941, so the area under food crops in 1944 was more than 2½ times the pre-war area and well over three times that of 1941.

Most food crop cultivations comprise a number of interplanted crops but an attempt was made to estimate the area that would have been occupied by each of the major crops if they had been planted as sole crops. At the same time, the yield and value of each crop were also estimated with the following results:

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area (Acres)</th>
<th>Yield</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrots:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swamp Rice</td>
<td>15,170</td>
<td>13,653</td>
<td>1,475,000</td>
</tr>
<tr>
<td>Hill Rice</td>
<td>4,250</td>
<td>2,145</td>
<td>15,798</td>
</tr>
<tr>
<td>Early Corn</td>
<td>9,850</td>
<td>5,346</td>
<td>426,000</td>
</tr>
<tr>
<td>Late Corn</td>
<td>7,510</td>
<td>5,360</td>
<td>8,726</td>
</tr>
<tr>
<td></td>
<td>35,870</td>
<td>24,524</td>
<td>2,405,000</td>
</tr>
<tr>
<td>Pulses:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pigeon Peas</td>
<td>2,000</td>
<td>500</td>
<td>80,000</td>
</tr>
<tr>
<td>Black Eye Peas</td>
<td>2,000</td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>Root Crops:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>7,100</td>
<td>14,800</td>
<td>352,000</td>
</tr>
<tr>
<td>Cassava</td>
<td>5,100</td>
<td>15,300</td>
<td>612,000</td>
</tr>
<tr>
<td>Tamarind</td>
<td>2,570</td>
<td>5,140</td>
<td>411,000</td>
</tr>
<tr>
<td>Dassenhun</td>
<td>2,490</td>
<td>7,470</td>
<td>299,000</td>
</tr>
<tr>
<td>Eddoes</td>
<td>1,360</td>
<td>5,400</td>
<td>136,000</td>
</tr>
<tr>
<td>Yams</td>
<td>1,300</td>
<td>19,920</td>
<td>50,710</td>
</tr>
<tr>
<td>Vegetables (Commercial)</td>
<td>4,000</td>
<td>12,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Fruits (and all crops not shown elsewhere)</td>
<td>6,000</td>
<td>18,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Total</td>
<td>77,546</td>
<td>150,829</td>
<td>8,469,000</td>
</tr>
</tbody>
</table>

The total area of all the crops planted in a year is of course considerably greater than the maximum area under cultivation at any one time for much of the land produces two crops during the year. The average yields on which estimates of production are based are the result of enquiry in all districts and are conservative. The value placed on each crop is the wholesale price that could have been obtained within the area of production if producers had offered their entire output for sale at the most favourable legal wholesale price obtainable to them. In fact, much of what is produced is consumed by growers and never becomes the object of any transaction, while much is considerably enhanced in value by services such as transportation and distribution before it reaches the consumer, but the total value shown above represents the estimated value of primary production alone.

LOCAL FOOD PRODUCTION AND MARKETING REPORT FOR THE YEAR 1944
A. E. TROTMAN. Officer in Charge, Local Food Production & Marketing.

Table (3)

<table>
<thead>
<tr>
<th>CROP</th>
<th>AREA (Acres)</th>
<th>CROP</th>
<th>AREA (Acres)</th>
<th>CROP</th>
<th>AREA (Acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RICE</td>
<td>24,000</td>
<td>Banana</td>
<td>6,460</td>
<td>Coffee</td>
<td>7,000</td>
</tr>
<tr>
<td>COCONUTS</td>
<td>12,000</td>
<td>Plantains</td>
<td>1,270</td>
<td>Rubber</td>
<td>850</td>
</tr>
<tr>
<td>PULSES</td>
<td>4,000</td>
<td>Sugar Cane</td>
<td>8,000</td>
<td>Citrus</td>
<td>12,000</td>
</tr>
<tr>
<td>ROOT CROPS</td>
<td>19,920</td>
<td>Cocoa</td>
<td>100,000</td>
<td>Tons Beans</td>
<td>6,000</td>
</tr>
<tr>
<td>VEGETABLES</td>
<td>4,000</td>
<td>Coconuts</td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>