SURVEY OF PEASANT AGRICULTURE IN

THE ST. AUGUSTINE AREA

By

W. J. C. LITTLE

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(I) THE SURVEY

The object of the survey was to obtain an ideal of the methods of agriculture and way of life of the peasantry in the St. Augustine area, and to propose any measures which might benefit the agriculture and future well being. The survey was carried out between November 1946 and June 1947. The northern part being dealt with from November 1946 till early March 1947 and the southern part from early March till June. The times were not ideal and any period of less than a year does not give an opportunity of seeing the land and crops at all seasons. The southern area was surveyed during sugar crop season and there was some difficulty in finding rice cultivation, many of whom were working on estates.

(II) INTRODUCTION

The well being of any country which has not been highly industrialized depends upon its agriculture. The people of an agricultural country can only attain a high standard of living if the best use is made of the man power and land available; when considering agriculture a long view must be taken for soil fertility is a capital asset which must be maintained as increased and probable trends of population must be related to the land which must feed and clothe the people. Estate agriculture may increase or decrease but even if it increases a considerable proportion of tropical agriculture will remain in the hands of peasants. The peasant has many inherent disadvantages to overcome, one of the greatest is his lack of education. He is often unable to plan the work of his holding; what to produce, how to dispose of it and the best use to make of the money obtained from its sale.
The area surveyed though small presents many of the problems found among peasant agriculturists all over the tropics. There is serious soil erosion in the northern area with wastage of soil capital and flooding. In the southern area the yield of rice is thought to be falling and thought is given to planting material. Much of the man power is wasted; going to and from the holding, cutting fodder for cattle, by bad selection of crops and in marketing.

If any of these problems can be answered in an area like this and more important still if a means can be found of incorporating these findings in the peasant way of life; informations will be available which will be of value over a wide area of the tropics.

(III) THE AREA
(a) Position and Topography:

The area is seven miles east of Port of Spain. It is about a mile wide and three and a half miles long stretching from the Tacarigua River in the south to the highest cultivation on the watershed of the Tunapuna River in the north. It is between 61°. 23' 15" and 61°. 24' 15" west and 10°. 37' 15" and 10°. 40' 30" north.

The topography of the area may best be considered in two parts Northern and Southern. The northern area is steep and mountainous with slopes of 30° and over quite common. The highest point is about 1000 feet above sea level. The southern area is flat raising only slightly in the north. Most of it is between the 25 and 50 feet contours. The area is drained by the Tunapuna river and its tributaries which is a perennial stream above St. Augustine and seasonal below it. A general comparison of the topography of the area may be obtained from Photograph I.

(b) Communications:

The Eastern Main Road and the Churchill Roosevelt road the two principal East West roads of the island passes through the centre of the area. There are stations on the Trinidad Government
Railway in Curepe, St. Augustine and Tunapuna. These are frequent bus and train services to Port of Spain. The distribution of population on mated roads and cultivation may be seen on maps.

Almost all houses are within a mile of a mated road though the roads actually to the houses may be very bad in the wet season. The roads to the cultivated land are not good. In the northern area the produce can only be taken by hand down very steep paths to the road. In the southern area most of the roads to the rice and cane lands are unmated. During the wet season these roads may be impassable or only greatly reduced loads may be taken by carts (Photographs 2 and 3).

(c) Distribution of the Population Housing and Amenities:

Most of the cultivators live in the centre of the area near the main roads, in the villages of St. Augustine, Tunapuna Pasea and Curepe. Some of those with land in the North of the northern area live on St. John's road. (Maps).

Most of the houses have wooden frames with walls of tapia roofed with thatch or corrugated iron. These houses cost little to build, they are easily removed or repaired, provide good protection from the weather and if kept clean and well built should be healthy. A large house is a source of pride and a sign of achievement. A successful peasant will invest a great deal of his savings in a house which he looks upon as a security for his family. (Photographs 4, 5 and 6.)

The centres of population are well provided with amenities such as: water, stores, churches, schools, cricket pitches and rum shops. The few peasants living at the top of the St. John's road are about a mile and a half from these amenities and this was mentioned by others with land in that area as the reason they preferred to live in villages.
(d) Distance of houses from Land:

In the northern area many peasants live two or more villages from their land. The walk to and from the land wastes a great deal of the peasants' time each day. During busy seasons the peasant may live in a shack on the holding (Photograph 7). Living away from his land the peasant takes less interest in it and there is not the same chance of help from wife and family. Another serious disadvantage is the ease with which produce may be stolen. The peasants in the southern area all live reasonably near their land.

(e) The People:

In the northern area the population is very mixed with a fairly high proportion of negroes. In the southern area Indians predominate especially as rice growers. Families are generally large and complicated.

(f) Climate:

The following records were taken at The Imperial College of Tropical Agriculture in the centre of the area.

Rainfall:

Mean annual rainfall 21 years. 68.5 ins. (Range 105-51 )
Mean wet season total rainfall (June-October) 58.0 ins.
' " " " monthly " 8.3 "
Mean dry season total rainfall (Jan.-May) 10.5 ins.
' " " " monthly " 2.1 "

NOTE: (i) Short record dry season (Petit Careme) Sept.-Oct.
(ii) Dry season rainfall monthly evaporates.
(iii) Majority of rain showers (60%) are light (intensity below 0.40 ins. hr.); of the remainder half (20%) are medium 0.40 - 0.75 ins. hr.) and half (20%) are torrential (intensity over 0.75 ins. hr.).
Temperature:
Air Mean annual maximum temperature 86°F.
" " " minimum " 70°F.

Sunshine:
Wet season 7 hrs. per day
Dry " 8 " "

Humidity:
Wet season 62% at 2 p.m. 100% at night
Dry " 55% " 2 p.m. " "

The records cannot be applied to the whole area for it may be considerably wetter and cooler in the Northern Area and the College rainfall may be higher than that in the south of the area due to the proximity of the Northern range.

(g) Soils of the Northern Area:

The parent materials are quartz and mica schists. A proper soil profile is rarely developed due to the steepness of the slopes and the ease with which the soils are eroded even under forest. The soils are thin often 6" or less from the parent rock. It is only the readiness with which mica schists decompose on exposure that saves many areas from being bare rock. The soils produced from their schists are not naturally fertile.

Laboratory examination of typical soils showed soils which were:- light, acid, medium organic matter content and medium nitrogen content. The Carbon Nitrogen ratio is quite satisfactory. The available nutrients as expressed by electrical conductivity are low. Available phosphate and potash are both very low.

(h) Soils of the Southern Area:

The soils of the southern area like those of the northern area are poor. The distribution of soil types may be seen from the soil map. The soil types are River Estate, Pasea, Golden Grove, Cunupia, Streatham and St. Augustine. River Estate and Golden Grove are quite useful light soils but all the others are very poor.
(1) Land Tenure:

There is little crown land in the area most of the land being freehold. Formally the land belonged to large estates, those in the north being Cacao and in the south sugar. In periods of low prices due to poor soil types these estates were unprofitable and estate agriculture was abandoned. In some cases only poor and inaccessible lands were abandoned as with Orange Grove and *Coomi* Estates.

The estates were either retained as a whole and let in small plots to peasants or sold in lots to individual peasants and small land owners. The rents payed are fairly high about \$4.00 in the Northern Area and \$7.00-15.00 in the southern area. The estate owners do not live in the area and take no interest in their estates beyond obtaining this rent regularly. Rent collection and estate management are in the hands of agents and no effort is made to fulfill the landlords obligations like the upkeep of traces.

Tenancies are from year to year with no written agreement. The peasant has no security of tenure and if turned off his land the provisions for compensation is inadequate. The dispossession of many *Coomi* cane farmers, by the estate with a year's notice from their crop season shows what difficulty lack of security of tenure may cause the peasant and gives good grounds for the desire to own land.

In the southern area there is a serious shortage of rice land and land values are high \$500 - 7.00 per acre. With the shortage and high price of land many potential peasants are being lost from the land. The holdings only provide part time employment on work for the older members of the family and the others must seek employment in trades or on estates. In this way many young men with an agricultural background are being lost from the land for want of land to work on.
The Monastery of Mt. St. Benedict is share cropping some of its land which is in the Northern area. The peasants are provided with land or an area of cacao and their produce is marketed for them. Under these circumstances share cropping may be most useful for the landlord retains an interest in the land and can protect its fertility. Where the landlord is a body corporate whose members have some knowledge of agriculture and a long term outlook share cropping may be most satisfactory. On privately owned land the system is not so satisfactory and exploitation goes on to as great if not to a greater extent than on rented lands. Cultivation is very poor for the peasant only receives half the value of any increase in yield.

(IV) CULTIVATION IN THE NORTHERN AREA

(a) Annual Crops:

(1) Clearing Bush

The peasant clears his land during the dry season to have it ready for planting at the beginning of the wet season. First the bush is hacked down roughly using axe and cutlass. No effort is made to cultivate on the contour or lay bushwood in contour strips. Wood of suitable size may be made into charcoal which helps to reduce the cost of clearing. (Photograph 8) The work is slow and hard and peasants usually have to employ labour to help clear their land. As soon as the bushwood is dry the peasant sets fire to it and leaves the fire unattended to burn his and any other land which may catch fire. Legally the peasant must cut fire traces round land he intends to burn and inform the local authority when it is to be burnt but this is not done. After burning, the land is absolutely bare with the charred remains of logs pointing in all directions (Photograph 9). These logs tend to accumulate the water into small rills and so increase its eroding powers. Much of the readily available phosphate and potash is being on the surface as ash which may easily be washed away. The loss of litter reduces the penetrability of the soil
for the fall of the rain is unbroken and tends to produce an impenetrable surface fan. Consequently this system of clearing encourages soil erosion and the rapid run off of water.

(ii) Cultivation.

The peasants tools are of the simplest, usually hoe, cutlass and axe. Cultivation is very scanty and the whole area of the soil is never worked over. Where the peasant intends to put a seed or plant the soil is stirred up with a hoe or cutlass to a depth of 3 to 6 inches and a slight tilth produced in which the seed or plant is placed using the cutlass as a trowel.

(iii) Cropping

The first crop after clearing is corn the most exacting crop grown on a large scale. The corn is planted at the beginning of the wet season and tomatoes and string beans may be planted between the rows. The next seasons cropping depends upon the fertility of the soil and if it is still fairly high the cropping may be similar to that of the previous year. If the fertility is too low for corn pigeon peas are usually planted with the same inter-cultivation as corn.

The land remains in cultivation for from two to four years on most soils depending upon the fertility. The yields of corn are very low and pigeon peas the only crop which does really well. Pigeon peas occupy a large proportion of the land and this over emphasis on one crop leads to difficulty in harvest and many foods are too dry when picked if there is not a large family to help. The peasants income is too dependant upon the success of one crop. The yields of string beans and tomatoes are low but the quality is quite high especially that of the tomatoes which though small are of good shape and flavour.

Other crops grown on a smaller scale are tania, cassava, bananas, yams and sweet potatoes. There crops require deeper soil and are usually confined to the valley bottoms where there are pockets of deeper soil (Photograph 10). Tacias and bananas are often grown in old cacao.
As soon as the crops no longer produce a return in proportion to the labour of cultivating them, the land is abandoned and allowed to revert to bush. The period in bush is usually longer the further the land is from the road and St. Augustine. The minimum period in bush is 6 to 7 years by which time enough fertility has been restored to grow one or two meagre crops.

This system of cultivation is more wasteful of land than it need be for the following reasons:

(a) No effort is made to control fires which sweep over large areas of bush in a dry season destroying crops, small trees and litter. The loss of litter encourages erosion and only fine resistant species of the flora remain. In this way the fertility of the entire area is being lowered.

(b) The holdings are laid out and cropped with no thought of erosion control. Holdings are of any shape and there is no thought of making them narrow and on the contour cultivation may go on right into gullies and crop rows are often up and down the slope. (Photographs 11, 12, 13, and 14).

(b) Tree Crops

(1) Cacao:

Almost all the land is too poor to grow cacao profitably unless the price is very high. During the period of high prices up till 1920 all the valleys were planted in cacao, some of which has been cut down to make room for peasant gardens. Cacao is still on an acreage basis the most important crop in the northern area. During the inter war period all the cacao was abandoned, pests and diseases spread unchecked and no weeding on supplying was done. With the recent rise in price some effort is being made to bring the trees back into cultivation. The yields are very poor and many of the pods are wasted by squirrels.

Most of the cacao belongs to the Monastery of Mt. St. Benedict and is let on a share cropping system to the peasants.
The peasant cultivates his area, ferments the produce and dries it on the monastery drying floor. The produce is sold by the monastery and part of the sale price returned to the peasant.

Even with improved cultivation and planting material it is unlikely that much of the land at present in cacao could produce cacao profitably.

(ii) Other Tree Crops.

A wide range of tree crops are grown in the area but only grapefruit which is grown on a small scale is important as a cash crop. There are two grapefruit orchards where yields are quite satisfactory though both are too large to be considered peasant properties. The Monastery of Mt. St. Benedict is supplying its share croppers with young budded grapefruit trees which they are planting out in the cacao. The trees are being given a poor chance for the peasants are unwilling to cut out any cacao tree which is shading them so long as there is a pod on it. The other trees grown include: breadfruit, pomerac, coconut, tonka bean, mango, lime and orange. These help to supplement the families diet and a small surplus may be available for sale.

(V) CULTIVATION IN THE SOUTHERN AREA

(a) Rice Lands:

(1) Introduction.

In pre war days rice could be imported from the East more cheaply than it could be grown in Trinidad and all the rice land in the St. Augustine area was not cultivated each year. With the war time shortage of food the position has changed and the land is eagerly sought. An Irrigation system has been initiated by the Government to try to improve the yields and the reliability of the rice crop. Most peasants have only a small area of half to three acres which produces enough rice for the family and near relations, only a little finding its way onto the open market. Rice cultivation is often only part time employment for a wage earner, a cane
farmer who endeavours to reduce the cost of feeding a family.

(ii) Irrigation and Drainage.

In the past there was no definite system of irrigation and water was obtained by peasants putting a number of small dams in the Tacarigua and Tunapuna Rivers. Their dams did not give a reliable supply of water especially on the higher lands. Drainage like irrigation was unreliable.

During the past year an irrigation and drainage system has been built which will give a reliable supply of water to half the area. The layout of the system may be seen from map. The water is obtained by damming the Tacarigua and Tunapuna rivers and drainage is into the Tunapuna River. The other half of the area is still dependant upon an unreliable irrigation and drainage system.

(iii) Cultivation and Planting.

One or two peasants do some cultivation before the wet season starts but the work is very heavy. Most of the cultivation is by oxen drawn ploughs and harrows and the rest is by hand. Each peasant saves his own seed which he may pregerminate. The seed is sown in a well peddled nursery rather too thickly to produce strong seedlings. Nurseries are kept damp but are not flooded for the first few weeks.

The seedlings are ready to transplant at about six weeks. Twelve plants are set in each clump and the clumps are about 6" x 6". A better yield would be produced with fewer plants in each clump. The only after-cultivation is one or two weedings. During the growing period the peasant tries to keep his land constantly flooded.

(iv) Harvesting, Threshing and Yields.

When the grains are fully formed and starting to harden the water is run off and the crop is left to ripen. Not enough attention is paid to the date when the water is run off which leads to excessive breakage of grain in milling. When ripe the grain is cut with a serrated bladed sickle and bound into sheaves which are
piled at the side of the plot till dry. Threshing is done by holding the straw and beating the ears against a slatted table through which the grain falls. The grain is taken home and given a final drying in the sun. Most of the grain is parboiled in a primitive way by soaking over night and spreading out to dry in the sun. The straw may be left in the field as a mulch or taken home for thatching or bedding stock. The yield of the first crop is about 2,400 lbs. per acre but varies widely from plot to plot. Much grain is lost at harvest due to the shedding and lodging of poor varieties.

After harvest any grains or tillers which may grow are left to produce a second crop. The yield of a good second crop is only about 700 lbs. and may not be worth harvesting. One peasant had planted a second crop but found the yield was too low to compensate for the extra work.

(v) Dry Season Use of Rice Land.

Ploughing the rice lands are used as a common grazing where the cattle must be tethered so that they will do no damage to banks or any crops which may be growing. The most widely grown dry season crop is woolly pyrol which requires little work and moisture and gives some return. One or two peasants can obtain water from the Tacarigua river right through the dry season and are able to grow good crops of vegetables. On most of the land though up till the present there has been no dry season irrigation and growing of dry season crops is greatly restricted. The rice straw makes a very good mulch for vegetable growing and more care could be taken of it (Photographs 15, 16). The principal vegetable crops besides woolly pyrol are: ochre, melongen and tomatoes.

In future with a reliable supply of water during the dry season there are considerable prospects of extending vegetable production. The rice crop, where only one crop is grown per annum, leads to great variability in employment, and the peasant has no work to do on his holding during the dry season. With irrigated vegetables the labour demand of the holding would be more uniform.
The effect of vegetable growing on rice yields could only be discovered with time.

(b) Cane Land Cultivation:

There are two principal cane growing areas in the southern area. There areas differ somewhat for they are on different soil types, and the cane goes to different factories. Methods of cultivation differ slightly from one area to the other.

(1) Cultivation.

The planting material used is cane tops, so planting must be done during the crop season. During crop season the land is hard and the peasant must plant his cane without thorough cultivation. The sets are put in with a crow bar. When the rains come the land is forked over by hand and the canes are usually inter-planted with vegetables. The vegetables grown between the canes are melongens, ochres, tomatoes and pigeon peas. These vegetables help to offset to some extent the cost of replanting. The cultivation of the cane consists of one or two forkings each year. Some pen manure is used on the cane lands but many cane farmers have no stock and those who have stocks take little care of their farm yard manure. The application of pen manure is made still more difficult by the very poor roads in the cane lands. Many peasants do use sulphate of ammonia at about 2 cwts. per acre which they obtain on credit from the Orange Grove estate. The estate also offers planting material at reasonable rates, but peasants are unwilling to buy it.

When a stand of cane becomes blanky the peasant instead of replanting supplies the blanks. This system is not very satisfactory and in time the peasants cane fields become very poor. The number of ratoons taken is very variable. In the west of the area peasants do not usually take more than five, while in the east many take up to eight ratoons. All larger cane farmers have to employ extra labour for forking their land. The cultivation on the land which the Caroni Estate is taking over was very poor indeed, but this was largely because peasants were not willing to spend a great deal of time on land they will only have for another year.
(ii) Harvesting and Yields.

Harvesting is the most laborious job on a cane farm and extra labour has to be employed. The peasant who can only deliver a few tons of cane to the factory each day can only fire his cane as is done on estates to reduce the labour. In this area no instances of burning cane to get it to the factory quickly were found.

A good yield of cane will go up to 30 tons, but many of the crops do not reach 20 tons. In some cases frog hopper damage was leading to a serious loss in yield. The yields are below those of estates in the area, not entirely due to poor cultivation, but partly to poorer soils and the fact that estate canes are planted in September to October, and are 18 months old when first cut, while the peasants are only 9 to 12 months old.

(c) House Lots:

Most peasants have a little land around their houses where they grow vegetables and fruit trees. The usual vegetable crops grown are: ground provisions, okra, melongen, tomatoes, and pigeon peas. Their vegetable crops are quite carefully tended and they are given pen manure where possible. Crops are often too closely planted. The trees grown include: bread fruit, jack fruit, mango, coconut, papaw, pomerac and avocado.

(VI) LIVE STOCK

(a) Types and Breeds:

The large animals are expensive and few peasant can afford to own a cow or donkey. Most of the larger animals are owned by peasants in the Southern area. Almost all peasants own poultry and many have a goat or a pig. The numbers of poultry are limited at present by the shortage of feeding stuffs, and only as many can be kept as will live on household scraps and waste produce.

The cattle are Zebu Holstein crosses with all gradations between the pure breeds and a little blood of several other breeds. (Photograph 17). Bulls are of all types and any well grown animal
commands the usual service fee of $2.00. There was a Government bull in the area but it was little used on account of the keepers attitude. This was being attended to by the agricultural department. The ideal cattle for this class of peasant must be a good draught animal, give a reasonable supply of milk and provide a good care when its working days are over. The present haphazard breeding policy is doing nothing to improve the situation.

(b) Feeding:

During the day cattle and donkeys are tethered on any piece of waste land where they can pick up a living. At nights they are kept in a pen near the owners house and fed on fodder cut from waste land. During crop season cane farmers feed their cattle largely on cane tops. In the St. Augustine area there is little waste land and during the dry season stock get very thin. This system of feeding is very wasteful of the peasants time, for an animal may be tethered some distance from home and taking out, watering, cutting fodder, and bringing in again may take a great deal of time. Any improvement in breeding will necessitate an improvement in feeding, or the improved stock will not show what they are potentially capable of.

(c) Housing:

The pens are near the owners home. This helps to reduce praedial larceny which is the principal reason for housing at nights. Pens are of simple construction with a thatched roof and open sides. (Photograph 18) shows a good pen with concreted floor, which is not usual. Their structures cost little to build, and with a concrete floor it should be possible to produce clean milk. No effort is made to cover manure heaps and a great deal of valuable manure is lost through washing in the wet season.
(VII) TRANSPORT, PROCESSING AND DISPOSAL OF PRODUCE

(a) Transport:

Only a small proportion of the peasants own any form of transport. The greatest demand for transport is from the cane farmers who have to deliver their canes to the Caroni Railway at the Iron bridge or to the Orange Grove factory. The cost of cane transport is high $1.50 per ton, but even at this price the return to the owners of carts is not very high for the congestion at the scales limits the amount they can cart each day. The cost of transport represents about 30% of the price received for the cane and every effort must be made to reduce this cost.

The other crops do not present such a serious transport problem, for they are more valuable per unit volume and there is not such a great demand for a short period.

(b) Rice Processing:

The peasants after clearing their rice by hand, par boil it. The rice is heated in water overnight and spread out in the sun to dry next day. Drying is difficult for there is little room around the houses and most of it has to be spread out on sacks on the road where it becomes dirty and is broken by traffic.

The milling is done by three privately owned mills in Curepe, St. Augustine and Pasea; a ridiculously large number of mills to handle the produce of about 200 acres. The mills are all Engleberg type hullers. The hullers are all in very poor mechanical condition and produce a very poor sample. A better supply of spare parts for mills would be a great help.

Poor samples are not entirely due to the state of the mills for the grains are of all sizes and colours and would be almost impossible to mill well.

(c) Disposal of Produce and Marketing:

The peasant is unwilling to use in his own home any produce
which has a high market value. Most of the rice produced is consumed by the family and near relatives and only a little is sold. The family retains as much of the ground provisions, as they require and the surplus is sold. The position with green vegetables, milk and poultry produce is very different from that of the starchy foods, for they are almost all sold. From a dialectic point of view this is an unfortunate situation by the high monetary return from protective foods is required to pay for shop, stores and rent.

The produce may be sold by the peasant himself or by a dealer. St. Augustine is quite an important residential district and a good deal of produce is sold locally at the markets. Some peasants market the produce in Port of Spain but this takes a great deal of time. Usually any produce which can not be sold locally is handled by dealers which is quite satisfactory for any increase in price from taking produce to Port of Spain is offset by the cost of transport and waste of time. The Monastery of Mt. St. Benedict provides a market for the surplus produce of its share croppers and transport.

Sugar cane is sold to estates at a price fixed by the Government based on the F.O.B. price of sugar.

(VIII) CONCLUSIONS AND RECOMMENDATIONS

(a) Land Tenure:

The peasant with no security of tenure or adequate provision for compensation makes no effort to conserve or build up the fertility of his land when he may at any time be dispossessed without compensation. He does not wish to build his house on land he may only occupy for a few more months so he lives in a village where he may obtain a house lot. Living away from the land much time is wasted going to and from the land, less use can be made of the labour of the wife and family, and there is not the same interest in a holding he does not live on.
Their disadvantages are overcome by freehold tenure, but it brings with it other disadvantages. The principal disadvantage is the high cost to the peasant which restricts the size of holding and the working capital available to develop it. Soil erosion control measures cannot be erected so easily on a large number of small properties as they can on one or two large ones. Peasant proprietorship is liable to lead to excessive subdivision of the land.

Leasehold tenure with adequate compensation for improvements offers most of the advantages of both systems. Compensation should be offered for the following:

(i) All growing crops, the amount being based upon the probable yields and market prices.

(ii) Unexhausted manures payment being on a similar basis to that in England.

(iii) Eviction from his holding by his landlord. Compensation at the rate of two years rent.

(iv) Any other improvements approved by the landlord. Compensation at these rates would encourage the peasant to put money into his land and try to build up its fertility. It would also give him greater security of tenure and to increase this security landlords should be encouraged to offer land on lease to good peasants. Written agreements between landlord and tenant should be compulsory.

(b) The Northern Area:

The peasants of the Northern area practice shifting cultivation. Shifting cultivation is not in itself harmful, where there is plenty of cultivable land in relation to the population, and the land is not unnecessarily exploited. In Trinidad especially, near Port of Spain, scarcity of land has lead to the cultivation of steep lands and the leaving of very little bush. In extreme cases like the Maraval Valley, all the bush has been removed. Soon if steps are not taken to prevent this indiscriminate felling and burning, all accessible land in the Northern Range will be cleared, leading to serious loss of fertility and flooding. The North of the survey
area is typical of the foothills of the Northern Range where the effects of erosion are beginning to be felt. In Trinidad there is no legislation to check this wastage of land.

Immediate Measures: At present serious soil erosion is taking place, but it will take many years experimental work to discover, the best way of dealing with soil erosion on this land and in the mean time, loss of soil will continue. The position is no serious though, that some steps must be taken at once if the foothills of the Northern Range are to grow more than poor scrub for many years to come.

The following are measures which could be enforced if made stationary and would help to conserve the fertility of the soil:

(1) The present legislation which requires the cutting of fire traces and improving the local authority should be enforced. The text of the law should be widely circulated and any offenders seriously punished.

(ii) Very steep slopes, ridges and gullies should be closed to cultivation. Maps showing cloud areas should be readily available.

(iii) All crop rows should be on the contour.

(iv) All land with a slope greater than 15% should be cultivated in contour strips not wider than eight yards, and must have at least 40 yds. of bush between any two strips of cultivation.

The following measures should be encouraged by propaganda:

(i) No burn charring of bush.

(ii) Posters along roads and in papers, warning people not to throw away lighted matches or cigarettes, and not to leave fires unattended.

(iii) Laying felled bush in strips on the contour.

(iv) Planting fruit trees on platforms with check ditches.

(v) The construction of small traces which would be surveyed free of charge by the agricultural department. The measures should be published by illustrated posters.
Long Term Measures: The measures proposed in the previous section are purely provisional, and are only a stop gap till reliable information is available about how this land should be cropped. In order to obtain reliable information, the departments of Agriculture and Forestry in conjunction with The Imperial College of Tropical Agriculture should acquire an area typical of the foothills of the Northern Range. If possible the area acquired should be a complete topographical unit.

The following points should be investigated:

(i) The types of erosion control which are available for the land and the cultivation?

(ii) The greatest angle of slope upon which each type of cultivation may go on without serious erosion?

(iii) The crops which do well and their effect upon Erosion Control?

(iv) Which tree crops will do well especially nuts native or introduced?

(v) How many years do land require under bush to recover its fertility after cropping?

(vi) Is it possible to develop any type of mix farming?

(vii) An investigational peasant holding on the lives of those at the Imperial College should be laid down as soon as enough information is available.

The importance of the soil erosion problem in Trinidad would justify the employment of a full time soil erosion officer, who would be responsible for investigations and the application of results.

(c) Southern Area:

(1) Rice Lands.

During 1939, Trinidad rice production was of little importance only a few peasants growing a small area for home consumption. During the War on account of the food shortage the Government has spent a great deal of money on irrigation works in order to increase the reliability and yields of rice. No money has been spent though on the agricultural side of rice growing. The peasants of the St. Augustine area have
been provided with a satisfactory irrigation scheme, but they have no idea of the best use to make of it, and are already prejudiced against it.

If rice production is important enough to warrant the money spent on irrigation it should be possible to afford a rice officer. The rice officer should investigate:

(i) Planting Dates.

(ii) Type of rice which gives the best yields. Will a crop with a long growing season give the best yield in Trinidad, or will two crops of shorter growing seasons give the best yield?

(iii) Knowing the type which gives the best yields, select palatable varieties of that type.

The rice officer would also:

(i) Form a link between the Hydraulic department and the Agriculturalist.

(ii) Using information obtained from investigations, lay down, demonstrative farms in each rice producing area. One of the demonstration farms would be in the St. Augustine area.

(iii) Organize a system for the production and supply of good seed.

(iv) Organize peasant societies in each area which would hold shows and form a link between the individual peasant and the agricultural department.

If possible the present irrigation scheme should be extended to over the whole area. Spare parts for rice mills should be given the highest priority. In the St. Augustine area as with many other rice producing areas of Trinidad, the output is not sufficient to keep a good government mill in operation. The situation could be improved by providing a portable huller with grading equipment drawn by a tractor which would also provide power. If such milling equipment were available, private mills would have to improve their machinery or go out of business.

(ii) Cane Lands.

Cane is not a good peasant crop and as cultivation on estates becomes more and more mechanised, the peasants' position becomes worse.
If the peasant is to continue to cultivate cane, his efficiency should be raised. The weakest point at present is the relationship between farmer and factory. Points which if attended to would raise efficiency on yield, transport and reduction of hand labour.

**Yield:** Yield could be raised by correct use of manures, good planting material and ratooning for a reasonable number of years. Peasants are unwilling to adopt these measures voluntarily, and the factory has a field staff which can give reliable advice on these points. Peasants could in their contract with the factory agree to carry out the recommendations of the estate field staff, or be penalized. Estates would provide advances for the purchase of manures. In this way the peasant would be compelled to make good use of his land.

**Transport:** The present congestion at scales is making cane transport unnecessarily expensive. Both estates and peasants complain that the other does not fulfil its loading permit obligations. A fine of 25$ per ton of cane delivered late or not accepted on time would make estates and farmers more careful to fulfil the obligations of loading permits.

**Reduction of Hand Labour:** The peasant with his small area of cane can make no use of mechanical cultivation. If a number of cane farmers would cooperate in the laying out of their holdings, it would be possible to produce rolling where heavy tractors could be used. The machinery would be supplied on contract by estates.

Measures such as those outlined would involve a loss of freedom and care would have to be taken that the powers given to the estates were not abused. But if the cane farmer will not help himself, every effort must be made to see that he is as efficient as possible.

(d) **Live Stock:**

The present cattle position is unsatisfactory for two reasons:
Poor animals and poor feeding. No one knows what the breeding of the ideal cattle for the tropics is, and till that is known the policy for improving native cattle can not be decided. A useful animal is the 5/8 holstein, 3/8 ebu cross, but as with any cross how is it to be maintained? The peasant using a good cross breed bull may be breeding the most suitable cattle. Research in breeding the larger farm animals is expensive and can not be borne by a single West Indian Colony. If possible, a research station dealing with fundamental problems of livestock breeding should be set up as soon as possible with adequate funds to keep large numbers of cattle. Some of the creole cattle of British Guiana have characters which make them useful peasant cattle if they could be fixed.

The great shortage of land in the St. Augustine/area and its high rental value makes peasants most unwilling to use it for the growing of fodder grasses. Until peasants do start growing fodder crops, though their stocks will remain poor and a great deal of time will be wasted.

(c) Roads:

In many places roads are so bad that they hinder agricultural efficiency. There is no power though to compel Landlords to keep up roads. Road repairing is difficult for a Landlord, for he has no labour or equipment. If possible, the roads should be taken once by the P.W.D. which would usually make an area assessment to be paid by the Landlords in proportion to the rental value of their lands.
General:

The peasants of this area are working on poor soil on a small scale and trying to compete with producers with a lower standard of living. The rice produce is competing with rice from the far east where conditions are better, and the standard of living lower. The cane farmer is competing with estates working on a large scale with mechanised cultivation and the best scientific advice.

If the St. Augustine peasant is to maintain his standard of living he must raise his efficiency. The present tendency of agricultural departments to pay more attention to peasant agriculture is most encouraging for the peasant must be helped or even compelled to make the most efficient use of his land.
Photograph I  General View of the Area Looking North

Photographs of the Roads in the Southern Area.
Photographs III. Peasant houses.
Photograph VII  shack on distant building  W  Area.

Photograph VIII  Charcoal pit  W  Area.

Photograph IX  Land cleared and burnt  showing logs in all directions  W  Area.
Photograph I. Trees on flat land in valley bottom N. area.

Photograph II. Cultivation of yuca N. area.

Photograph III. Slope in N. area showing poor layout of holdings.
Photograph XIII. Cultivation of Pidgeon Pao on a slip slope, N. Ava.

Photograph XIV. Cultivation of slip slope showing washing round roots, N. Ava.
Photographs XV & XVI  Dry season vegetable cultivation with mulching. S. Area.

Photograph XVII  Typical cattle.

Photograph XVIII  Good type of cow pen.
Roads Irrigation & Cultivation.

[Diagram showing roads, irrigation, cultivation, and other land use markers.]

Key:
- Metalled Roads
- Unmetalled Roads
- Irrigation
- Drainage
- Sugar Cane
- Rice
- House lots and Vegetables
Soil Map S Area

1. Zonal Soils
   a) Gray Brown Podsol, River Estate
   b) Yellow Podsol, Pasea

2. Intrazonal Soils
   a) Planasol, Streetham
   b) Azonal Soils
   Debrisal St Augustine