

R E P O R T

ON A

"SURVEY OF PEASANT AGRICULTURE IN TRINIDAD".

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Submitted in part requirement for the Associateship of the
Imperial College of Tropical Agriculture.

1947.

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I N T R O D U C T I O N .

The need for a greater knowledge of peasant agriculture in Trinidad has become very apparent, and until recently very little work has been done on surveys of peasant agriculture in order to obtain that knowledge. Until such survey work has been carried out and investigations made by setting up experimental peasant holdings it is futile to attempt to improve the peasant agriculture and raise the standard of living of the peasants. The Department of Agriculture has been carrying out investigations on the crops grown, and yields obtained by peasants. This work necessarily takes considerable time, but fairly extensive areas have now been covered by Agricultural Officers and Crop Record Sheets have been compiled. The Department of Agriculture at the Imperial College has now started its programme for investigation of peasant agriculture by means of experimental holdings. This experiment is designed to enable the department to work out from the results the most suitable size and type of holding for land settlement. The object of the present survey has been to collect information as to the present state of peasant agriculture in Trinidad which may prove of some value in the working out of a policy for improvement of the peasants' agricultural practice. Unfortunately the area surveyed has of necessity been limited due to the lack of time but I think has been sufficient to bring to light several points of interest which are worthy of further investigation - points which may help in the development of a new and far-sighted policy for the improvement of peasant agriculture in Trinidad.

DESCRIPTION OF THE SURVEY AREA.

(1) Location and topography.

The survey area is situated in the County of St. George in the wards of Tacarigua and Cunupia; it is bounded on the West by the Curepe Ravine and St. Joseph Ridge and on the east by the Tunapuna River, in the Northern section. There are no topographical features by which the Southern section can be delimited since this part is flat and can only be defined by a sketch map and coördinates. The Northern and Southern sections are separated by the Residential township of St. Augustine, and the Imperial College of Tropical Agriculture. The whole area lies between the coördinates 456 000 N and 422 000 N and 390 500 E and 406 500 E on Ordinance Survey sheets B18 and B23.

The Northern Section is hilly varying in elevation above mean sea level from 100 feet to over 2,000 feet. The Southern section varies between 25 feet and 40 feet above mean sea level. The map showing topography though small shows the tendency to slope from 2,000 feet at the northern end down to 25 feet at the southern end of the area.* The main valleys intersecting the Northern section are the beds of the Tunapuna and San Miguel Ravines, which join to form the Tunapuna River on the east side, and the smaller Curepe Ravine on the west side. The Tunapuna River flows down between St. Augustine and Tunapuna into the Southern section, swings to the west and is joined by the Curepe ravine just outside the western border of the survey area, continuing westwards to join the Caroni River due south of St. Joseph. The Tacarigua River forms the Southern boundary of the survey area flowing almost due west until it turns south at the south west corner of the area to join the Caroni River.

—/ The northern

*See topography map on page 3.

The northern hilly section of the survey area extends to some 1,200 acres, while the acreage of the flat cane and rice-lands of the Southern section is approximately 650.

(ii) Soils.

A detailed soil survey of the Northern section has not yet been carried out but Dr. Chenery in his Provisional Soil Map (1939) describes the soil as Maracas sand derived from the Quartzose Schizts of the Northern Range with Maracas silt in the main valleys. In the course of this survey soil samples were taken at depths of 1 to 6 inches and 6 to 12 inches. The method of sampling was as follows:

ten augre borings of the top 6 inches were taken over an area of about an acre which appeared to be representative of a soil type; these ten borings were mixed together to give one sample of the top 6 inch layer of that soil type. A similar mixture of the corresponding 6 to 12 inch borings was made to give a representative sample of the 6 to 12 inch layer.

Seven such pairs of samples were taken and analysis was carried out by the Chemistry Department of the College. The results of this analysis are set out in Table I. The figures for index of texture vary between 12 and 35 indicating that the soil varies from a sand through loam to a silt. There is also a variation from highly acidic to alkaline conditions both in the top 6 inches and the 6 to 12 inch layer. The percentage of free Calcium Carbonate is non-existent except in both layers of sample G where it is extremely low. This sample was taken down both slopes of a valley S.S.E. of the Monastery of Mount St. Benedict. In the valley bottom there was some old cocoa and the slopes were just reverting to bush from bananas and ground

—/ provisions.

TABLE I.

RESULTS OF LABORATORY EXAMINATION OF SOIL SAMPLES.

(8th February 1947; Top and second 6-ins layer)

Lab. No.	Bag No.	Depth (ins.)	M.P.S. Sand I.T.			Reaction Norm. Exch.		O.M. Total C/N ratio			Elect. Cond. Av. Rate		Avail. P ₂ O ₅	Avail. K ₂ O
			(%)	(%)	(%)	(pH)	(pH)	(%)	(%)		(mhos x 10 ⁻⁶)		(p.p.m.)	
ø639	A1	6	25	68	12	4.7	4.1	1.76	.127	8.0	39	10	6	85
ø640	A2	12	22	63	10	4.8	4.0	0.74	.082	5.3	28	3	6	
ø641	B1	6	31	62	19	5.7	5.4	3.58	.195	10.7	69	22	8	161
ø642	B2	12	24	60	12	5.6	4.6	1.17	.126	5.4	37	5	9	
ø643	C1	6	27	64	14	5.2	4.2	3.50	.200	10.2	44	10	4	103
ø644	C2	12	26	63	14	5.1	4.2	2.13	.167	7.5	36	6	11	
ø645	D1	6	42	39	35	5.4	4.6	5.10	.261	11.3	51	11	4	73
ø646	D2	12	36	39	29	5.2	4.3	2.31	.216	6.2	44	5	9	
ø647	E1	6	35	42	26	5.1	4.1	3.50	.236	8.6	43	11	25	73
ø648	E2	12	37	37	32	4.8	3.8	1.62	.187	5.0	45	4	4	
ø649	F1	6	29	68	15	4.9	3.9	4.07	.214	11.0	51	14	4	88
ø650	F2	12	23	65	10	4.7	3.7	1.82	.114	9.3	35	4	3	
ø651	G1	6	37	37	30	7.2*	6.8	4.51	.246	10.7	204	72	13	90
ø652	G2	12	32	45	23	7.1 ⁺	6.4	2.72	.188	8.4	151	100	7	

*CaCO 0.60 per cent.

+CaCO₃ 0.20 per cent.

NOTES ON SOIL SAMPLES.

- A. Old cacao land at head of Tunapuna River. Very steep slopes. Loose friable soil.
- B. Recently cleared bush on steep slope. Head of Tunapuna River. Rocky outcrops. Loose schiztose soil.
- C. Bush adjacent to B area.
- D. Secondary bush on slopes above Empire Cotton Station. Darkish soil with apparently more body in it.
- E. Lower slopes to East of St. Joseph River. Mainly in Citrus. Very variable soil depth.
- F. West of upper parts of Tunapuna River. Mainly in light tree growth. Rocky outcrops especially at top of area.
- G. Both sides of a valley S.S.E. of Mt. St. Benedict Monastery. Just reverting to bush from banana and ground provisions. This soil sample varied slightly over the ten borings, being more loose and schiztose on the slopes and somewhat more solid in the bottom of the valley where apparently there was more silt.

M.P.S. = Mean Pore Space.

I.T. = Index of Texture.

O.M. = Organic Matter.

provisions. The percentage of organic matter ranges from medium low to medium high and the Nitrogen percentage from medium to high. In the top 6 inch layers of samples B, C, D, F and G the C/N ratio rises above 10.00 indicating incompletely decomposed plant residues in the samples. Soils B, C, D, E, F and G could be productive cacao soils judging by the C/N ratio (range between 8.5 and 11.0) but Dr. E.M. Chenery in his Land Productivity map (1939) rates them at Grade IV (low) for cacao. The sample G also shows in the analysis that the available nutrients content of this soil is very high with a high rate of solution while the other samples all show a medium to low available nutrient supply with low to very low rate of solution. All samples show a rather low to very low supply of available P_2O_5 and with the exception of samples B and C a low K_2O content. The positions of those soil samples are indicated on the General Map by the letters A to G. No soil samples were taken in the Southern section of the survey area since this part has recently been surveyed by Dr. Chenery. His map of this area is reproduced on page 7. Practically all of the south central part of this section is a yellow podsollic Pasea clay* which dries out and cracks to great depths in the dry season and cannot therefore be utilized except by irrigation. This soil however makes the rice-fields of the wet season. The other soils of this section produce sugar cane and ground provisions. Cane is cultivated on the Cunupia and Mon Plasir Clays in the S.W. corner and on the River Estate Sand and Golden Grove loam of the N.E. with ground provisions along the southern side of the Churchill Roosevelt Highway on River Estate Sand and Streatham Sand. The remainder of this Southern section is occupied by house-lots.

/ (iii) Drainage and Irrigation.

*See Appendix I. Soil Profile of College Rice-plots.

(iii) Drainage and Irrigation.

In past years there has been virtually no irrigation in the Southern section. The Drainage and Irrigation Department, however, are now digging irrigation channels. This will be of great benefit to the Padi farmers since it will make it possible for them to grow two crops of padi per year; one crop in the wet season and another under irrigation in the dry season. At the present time many of the peasants try to grow ground provisions in the dry season, but without irrigation this is practically useless. A few who have plots near the Tacarigua River have been able to irrigate during the dry season to produce tomatoes, okras, sweet potatoes and other provisions. These peasants are averse to the Drainage and Irrigation Department's Plan, since they will have to pay irrigation rates when the plan is completed. The peasants further away from the Tacarigua River however, welcome the plan as a great boon which will now make it possible for them also to cultivate either ground provisions or a second rice crop in the dry season. Drainage from the rice-plots and cane beds is led into the Tunapuna River, which is practically dry during the dry season, and the Tacarigua River. Traces become practically impassable in the wet season due to flooding which is aggravated in most cases by drainage trenches becoming blocked by weeds, or by their banks being trodden down by cattle. In many cases bridges across ditches have fallen in and nothing has been done to repair them. Due to animals being led across those ditches the banks have also been trodden down resulting in flooding and erosion.

The photographs below show irrigation channels and mud holes due to blocked drainage channels.

—/ I. Main Irrigation channel

I. Main Irrigation channel running parallel to Freeman Road.

II. A trace which has been flooded due to inefficient drainage. Erosion has followed.

III. Another trace completely impassable due to the huge mudhole in the centre of the photograph.

IV. Bridge over a ditch which is practically blocked by vegetation.

In the Northern section irrigation in the dry season is quite impracticable due to the topography of the area. Much could be done however to conserve moisture. Due to repeated firing of the bush, hill slopes are completely denuded and all rain water runs straight off in the wet season resulting in erosion. No effort, or very little effort is made to check run off with the result that all rain is carried away by the rivers which become swollen with floodwaters in the wet season and are completely dry in the dry season.

(iv) Erosion.

No effort is made to combat soil erosion except by a very few erosion-conscious peasants. These few however can do little if their neighbours shut their eyes to the soil which is being carried away from their plots annually. A concerted effort is required to stop erosion and what is every bit as important to conserve soil moisture. Every year indiscriminate firing of bush is carried out in the dry season and the slopes left bare for the rains which follow to wash off the friable top soil with its plant foods. A few peasants lay cut bush along

— / the slopes

the slopes and do in some measure control erosion on their own plots. Cultivation is carried on too far up the slopes, leaving no natural forest as a water reserve area, and is also carried right down into the bottom of the valleys. Due to the nature of the soil gully erosion does not become very serious since the water cuts down deeply but does not broaden the width of the gully. Much could be done by contour cropping, terracing and ridging, and also by building check bunds across the ravines so that the flow of water becomes slowed down. The rapid run-off of rain-water in the wet season from this area not only leaves the soil parched in the dry season but has its repercussions on the flat Caroni Estuary where the river becomes silted up and causes serious flooding over a very wide area.

The following photographs show cultivation carried on right up the slopes of a valley, and steep slopes cleared of bush by slashing and burning. One of them shows tree roots uncovered by erosion.

V. General view of hillside cultivation carried on too far up the slope.

—/ VI. Steep slope

(v) ~~Residence and Domestic~~

In the hill country section the vast bulk of the population is centered in St. John's village and around the Santa Margarita-San Gabriel road, while some of the population lives in St. John's. Population centers live on their hillside farms in the valleys, some of them beyond the jurisdiction of St. John's. The situations of these centers of population are extremely healthy although modern conveniences tend to be non-existent or extremely poor. The water supply in this section is very precarious in the dry season except where public water-taps are provided. The population is concentrated in the valleys.

- VI. Steep slope cleared of bush. A few piles of wood are visible lying along the contour. In this case however it looks more accidental than deliberate.

On the west side of St. John's road domestic water is obtained from a running stream similar conditions obtain. Very few plantations live close by the Santa Margarita Road, this area being almost exclusively occupied by the open plains with private fire-water supplies laid on.

Public water-taps are indicated on the large general maps. The small community in the Corrales section to the west is well supplied having two public water-taps. Residents living in isolated spots depend on rivers for domestic water, or wells in some instances. Mr. Farley who owns a coffee estate has a pump in a valley S.W. of the Hacienda which supplies his estate with domestic water and also the dairy farm owned by Mr. Romero (previously owned by Farley).

In the Southern section the population is concentrated near the Guayaquil-Buenos Aires Highway. Although an ice-lying line (about 20 feet above sea level) there is no danger of flooding here. The water supply is reliable, being taken from the river.

- VII. Roots uncovered by erosion on a steep slope.

(v) Residence and Domestic Water Supply.

In the hilly Northern section the vast bulk of the population is centered in St. John's village and around the Santa Margarita Circular road, while some of the cultivators live in St. Augustine. Isolated peasants live on their holdings further up the valleys, some of them beyond the termination of St. John's Road. The situations of these centres of population are extremely healthy although modern conveniences tend to be non-existent or extremely poor. The water supply in this section is very precarious in the dry season except where public water-taps are provided. The population of St. John's village on the East side of St. John's road obtain their domestic water from the Tunapuna river which tends to dry up in the dry season, and further is extremely open to contamination by sewage; on the west side of St. John's road domestic water is carried from a ravine where similar conditions obtain. Very few cultivators live close by the Santa Margarita Road, this area being almost exclusively occupied by the upper classes with private pipe-water supplies laid on.

Public water-taps are indicated on the large general map. The small community in the Curepe Ravine to the West is well supplied having two public water-taps. Peasants living in isolated spots depend on ravines for domestic water, or wells in some instances. Mr. Farfan who owns a citrus estate has a pump in a valley S.S.E. of the Monastery which supplies his estate with domestic water and also the dairy farm owned by Mr. Ramsaran (previously owned by Farfan).

In the Southern section the population is concentrated near the Churchill-Roosevelt Highway. Although on low-lying land (about 30 feet above Mean Sea Level) there is no danger of flooding here. The water supply is reliable, there being three public water-taps and several draw-wells. Some of the peasants

however have to carry their water for considerable distances.

The peasant houses vary quite a bit in size and construction but on the whole are adequate and suitable since the peasant really only requires his house for sleeping. The majority of houses have a wooden framework with walls of tapia, which is ordinary clay mixed with grass. The grass is hung over the wooden framework, having first of all been treated with mud by trampling into a mud pit. The walls are quite strong when the mud dries out, and are very often faced with cement. The roof is normally of thatch. Other peasants prefer wooden huts with galvanized iron roofing, while some of the more prosperous members of the community have built themselves houses of European style. The wooden huts and usually tapia houses also are raised on piles. Other mud huts however, such as are usually found on the Southern section are built on the ground with beaten earth floors. Huts which were visited and thrown open to inspection appeared to be quite comfortable inside, though the outside appearance may at first have caused doubts to be entertained as to the comfort of the peasants.

Examples of peasant houses are shown in the photographs below.

VIII. Tapia house with galvanized iron roof and beaten earth floor - St. John's Village.

IX. Tapia house faced

IX. Tapia house faced with cement - galvanized iron roof -
set up on piles - wooden floor - St. John's Village.

X. Tapia house on piles - wooden floor - thatched roof
- Southern section.

XI.* Chadee's house - St. Augustine - concrete on piles.
European style.

(vi) Communications.

The area is well supplied with main roads but secondary roads and traces are in a very bad state of repair. In the Northern Section there are far too few traces and transport becomes extremely difficult. Pigeon peas and other crops are carried for several miles in head loads, there being no other means of transport. These loads are often carried down foot-paths on extremely steep slopes, and many of these paths are becoming starting points for gully erosion. Apart from lack of good traces and paths the reason for these head loads being carried so far is the fact that cultivation is carried on on slopes which should never have been cleared of their natural vegetation. In the Southern section traces become quagmires in the wet season and are quite impassable to vehicular traffic. Bridges also are in an extreme state of disrepair especially on Streatham Lodge estate, and the proprietors apparently refuse to do any repairs or assist the peasants to do something to alleviate their desperate plight.

The Eastern main road is well supplied with buses and private taxis plying between Arima and Port of Spain. Many of the peasants however have to travel several miles to reach the bus-route. The Churchill-Roosevelt Highway, a first class road built in wartime for war transport, provides an excellent route for donkey carts carrying produce from the Southern section into Port of Spain. There is no bus service however on this road. The Trinidad Government railway passes between the Northern and Southern section there being stations at Curepe, St. Augustine and Tunapuna.

(vii) The People

The population is a mixture of East and West Indians with the balance probably tipped in favour of East Indians or

—/ people of East

people of East Indian descent. The majority of East Indians are Hindus who observe the customs of their original home. Weddings and other celebrations and festivals e.g. Hosein are carried out in traditional manner. One farmer, who has prospered and built himself a good concrete house (see photograph No. XI on page 15), invites his neighbours to prayers and supper, this apparently being considered a social and religious duty of the prosperous. When interviewed he disclosed that the cost of such a supper and prayer meeting ranged between \$100 and \$200.

Where there are children of school age these are sent to school, some of the more prosperous peasants keeping their children at school until the age of 16 and some even finding it within their means to send their children to Queen's Royal College in Port of Spain. There are several schools within or near the survey area. In St. John's Village there is a primary and a secondary school, both administered by the Monastery of Mount St. Benedict. The Boarding School within the Monastery precincts however caters for the children of the upper classes all over Trinidad. There are government schools in Tunapuna and Curepe which the majority of children from both sections of the area attend. In several cases children are sent to the Modern Private School in Tunapuna which caters for children up to the age of 16.

It is interesting to note that those peasants who can afford to keep their children at school, do not wish them to follow in their fathers' footsteps but encourage them to become clerks, stores salesmen, mechanics, civil servants etc. and of course the inevitable taxi drivers.

The general state of health of the population seems to be very good and cases of illness appear to be largely confined

—/ to old people

to old people and sometimes children. This is rather an interesting point since it demonstrates that even in the poorer types of mud huts the people can still keep themselves healthy. It was quite a common thing to be told by persons interviewed that they had worked for so many years without any sickness.

Practically all the families are exclusively farmers or farm labourers and only in St. John's Village does one find a few shopkeepers and other tradesmen.

The peasantry now rely much more on imported foodstuffs than formerly. Tinned milk and meat are now being used in nearly every home. Most of the requirements of the families can be met locally in the shops of Curepe, St. John's and Tunapuna. Market days see a lot of activity to and from Port of Spain however and many articles of food and clothing are purchased after the family have disposed of their goods in the market. Usually the sale of products, such as ground provisions, is carried out by the women who set off early in the morning with baskets in each hand as well as head loads. Heavier and bulkier products are taken to market by donkey cart, often by night, in order to catch the market early in the day.

Enquiries as to the existence of community councils or coöperative societies received answers in the negative both in the Northern and Southern sections. The lack of coöperative credit societies means that a few of the wealthy shopkeepers have become money lenders, and in a few instances it was found that holdings were mortgaged.

For relaxation there is quite a selection of cinemas from which the peasant can and does choose. In Curepe there is a cinema (Planet) which shows mainly Indian films. Not all however can afford such entertainment and other sources of

— / pleasure are cricket

pleasure are cricket and other ball games, and swimming in the rivers.

(viii) Income and Expenditure.

It is extremely difficult to get any definite idea of income and expenditure. Both seem to vary enormously. Some of the families depend entirely on their gardens* for their livelihood, especially in the Northern section. In the Southern section however the padi and cane farmers supplement their income from their holdings by working on sugar estates and irrigation works. Caroni Sugar Estate at the present time pays \$1.20 a day in the wet season and \$2.60 for cane cutting in the dry season. Apparently a bonus of 30¢ is paid to younger workers with a good education, suitable for more specialized jobs. Expenditure is mainly on articles of food and clothing and on rent. With the advent of the new drainage and irrigation scheme in the Southern section an added expense will be irrigation rates. Although the irrigation rate has not yet been fixed opinion seems to be that it will be \$1 per acre.

Some of the stock-keeping farmers spend considerable sums on stock-feed, including coconut meal at \$1.20 per 100 lb., and bran. In a few cases artificial fertilizers are purchased.

LAND TENURE.

All forms of land tenure are met with on the area. Cane and rice-plots are held either freehold or by cash tenancy. Cane lots are leased to farmers by Caroni and Streatham Lodge estates. As far as Caroni Sugar Estate is concerned there can be no trouble with default in rent since unpaid rents can be deducted from the cash due to the farmer for his cane. This is the normal procedure in any case. The average size of holding is 1 to 3 acres with a rent of \$7.50 to \$10. The rice lots tend to
/ be much smaller

*Term applied in West Indies to the family holding.

be much smaller varying in size from $\frac{1}{4}$ acre to 1 acre with a rent of \$10 per acre. The demand for rice lots is so great that the plots cannot be enlarged, unless a padi farmer is fortunate enough to be able to rent two plots.

In the Northern section again one finds both freehold and cash tenancies. In the Curepe Ravine one acre house lots have been purchased from the Crown at \$60 per acre. The pigeon pea areas around Santa Margarita road are rented at \$6 to \$8 per acre. While higher up the slopes rents range from \$3 to \$7 per acre. The size of holding tends to be larger than the rice and cane lots of the Southern section, varying from one acre up to 20 acres in some cases. Probably one of the most important reasons for this larger size of holding is the fact that shifting cultivation is practised and half the holding may be worked for 2 or 3 years and then allowed to revert to bush while the other half is brought under cultivation.

The Monastery of Mount St. Benedict lets out land on a share cropping basis. Rehabilitation of the old and derelict cacao at the head of the Tunapuna River is being carried out by eleven contractors. For the first 2 years the contractor gets all the crop and thereafter the crop is shared on a 50-50 basis with the Monastery unless the cocoa is still in bad state. A written agreement is signed by the Trustees of the Monastery and by the contractor. This agreement may be terminated by the monastery at any time and in any case terminates on the death of the contractor. The contractor may not hand over his cocoa to a nominee, and must sell all his cocoa to the Monastery. Each contractor takes on a certain number of cocoa trees according to the labour capacity of the family i.e. from 1,000 to 5,000 trees. This cocoa is spread up the sides of some 32 ravines and is in a very bad state, being very badly attacked by squirrels.

Young orange trees are being planted through this cocoa very irregularly, and apparently with no system or knowledge of citrus culture, to be shared on the same basis as the cocoa. The contractor is also allowed 1 acre of shiftable land, for food crops, for which he pays a rent of \$2.40. Any surplus food must be sold to the monastery. Most of these contractors live in St. John's village but in any case the situation of a contractor's house must be approved by the Department of Health, and must be easily accessible to a doctor. The rest of the Monastery land is devoted to Grapefruit, Julie Mangoes, Coffee, Limes Tonca beans and Coconuts, with 30 acres forest as a water reserve area, and 188 acres uncultivated land mainly in bush or forest. The labour shortage of the past 7 years is partly responsible for the bad state of the cocoa. Yields of citrus fruits, coconuts and Julie Mangoes are medium to low, though the Mangoes are of good quality. The Monastery also owns 8 apiaries, distributed through the Northern Range and keeps a lot of poultry in batteries, and cages as a protection against the mongoose, and praedial larceny. Total area of the Monastery lands is 600 acres.

Streatham Lodge Estate extends to 339 acres, 50 acres of which are let out in houselots to the tenantry. There are 150 acres under peasant farmers' cane, but the tendency is now for cane to be given up in favour of ground provisions. The remaining 189 acres are under padi. The 339 acres are distributed between 340 tenants the average size of holding being 1 acre. The rent for cane holdings is \$7.50 per acre and \$10 for padi-land. The tenants build their own houses and can sell or let their house if they move. There is no compensation for improvements made by the outgoing peasant. Cane yields are low and were especially low this year (1946-47) due to froghopper damage. The estate,

— / one of the

one of the last privately owned, is owned by 3 people with equal shares. A Rent Restriction order prevents ejection of the tenant. Expansion of the tenantry is forbidden until a plan is presented to the Public Health Department. Roads are very bad especially in the wet season, and the Public Health Department wants oil roads and concrete drains laid down at a cost of \$12,000 per mile. The population is almost exclusively East Indian or East and West Indian mixed blood.

FRAGMENTATION OF HOLDINGS.

There seems to be little fragmentation due to Hindu custom and law of inheritance. The main reasons for fragmentation seem to be

- 1) the scarcity of land, resulting in a cultivator seizing the opportunity when it presents itself, of taking another piece of land often miles away from his original piece; and
- 2) increase in size of family necessitating a larger acreage for full employment.

This latter case does not arise very often however since there is a growing tendency for the younger generation to leave the family and find work elsewhere, or remain at home and work on nearby sugar estates, or on the Monastery lands.

One of the worst examples of fragmentation was observed on Streatham Lodge where one cultivator rents a total of $4\frac{1}{2}$ acres comprised as follows:

- (a) A houselot of 1 acre.
- (b) A rice plot of $\frac{3}{4}$ acre.
- (c) A rice plot of $\frac{1}{4}$ acre.
- (d) A rice plot of $\frac{1}{2}$ acre.
- (e) A sugar cane plot of 2 acres.

—/ The rent of

The rent of the house lot and rice lots together was \$17.50 and that of the cane lot \$15.

Another example, of what perhaps is better termed multiple holdings in this case, is taken from the Northern section where A.S. Bates holds two lots freehold, one of them extending to 9 acres, 3 roods, 36 poles and the other to 6 acres, 1 rood, 27 poles, and he also rents 12 acres, 1 rood, 24 poles. All of this land is worked by hired labour however.

With fragmentation a family cannot possibly keep an eye on each lot of land all the time with the result that praedial larceny does occur, though not to any great extent in the area. Yet one peasant had to give up keeping stock because all of them were stolen. His wife had died some time ago. While he was working elsewhere all his cattle and poultry were stolen. Now he only keeps a donkey.

LABOUR. In the Northern section the holdings are usually sufficiently large to keep the whole family occupied, though in some cases work is sought elsewhere. Share croppers are occupied with their cocoa and citrus all the year round.

In the Southern section the majority of peasants have too small acreages to keep them employed all the year round, and most of them work on the nearby sugar estates. Indeed estate work is their main source of income. Employment may be by task or by the day. Cutting cane, a man can do approximately 3 tasks per day at 55¢ per task, making an income of \$1.75 per day, on Orange Grove Estate. (On Caroni Estate labour is paid \$1.20 per day in the wet season and \$2.60 in the dry season for work on the canefields.)

Work can also be found with the Drainage and Irrigation Department, which is at present constructing irrigation works in the area. This outlet for labour however will be cut off when the irrigation scheme is completed.

In the Northern section some holdings are sufficiently large to require hired labour* during busy seasons such as planting and harvesting. The majority of families however are self-sufficient as far as labour is concerned.

During cane and rice harvest the peasantry usually work on a mutual aid system.

LAND UTILISATION.*

Due to the pressure of population in the Southern section every available acre of land is cultivated with the exception of a small area in the south west corner which is a swamp and at present covered by reeds and bushes. Proper drainage should however make it possible to bring this also under cultivation.

Of the 1,200 acres in the Northern section 600 acres are uncultivated. It is estimated that 200 acres of this uncultivated land is under forest (natural or nearly so) while the other 400 acres is secondary bush. It is rather unusual to find that there is apparently no significant difference between cash tenancies and freehold with respect to the proportion of the holding cultivated. Both cash tenants and freehold tenants practise bush fallowing. Normally one would expect to find that cash tenants cultivated the whole of their holding while freehold tenants tended to cultivate only part. The 600 acres of cultivated land includes the old cocoa plantations owned by the Trustees of Mount St. Benedict Monastery.

Much of this cultivated land is too steep and should not be brought under cultivation although in many cases profitable crops could be grown with proper care in soil conservation measures. None of the Northern section is in pasture (so-called) with the exception of approximately 5 acres which have recently been cleared of bush for pasture for dairy cattle on Tucker's Dairy Farm. The
____/ photographs below show

*Appendix III. Summary in tabular form of information accumulated by investigation and by abstraction from Crop Record Sheets.

photographs below show on left the cleared land and on right the uncleared bush adjacent to it.

XII

XIII

BUSH FALLOWING. Bush fallowing is practised only in the hilly Northern section. This is a cheap and convenient method of restoring the fertility of the soil. Land is quickly prepared for cultivation by firing, and stumps help to a certain extent in checking soil erosion. Crops are usually planted without any tillage. Thus by practising bush fallowing crops are grown at minimum cost. Much of the manurial value - especially the potential humus value - of the bush is lost by burning. Clearing rather than burning the bush would enhance the value of bush fallowing. Cleared bush could be arranged along the contours to check soil erosion and leaves and other plant-residues would increase the organic matter content of the soil. Permanent cultivation with rotation would involve the expense of manures and soil conservation measures and would involve considerably more work on the cultivator's part, and so he chooses the lazier and cheaper method. Enormous damage is often caused by carelessness in firing and allowing bush fires to get out of control. Such uncontrolled fires have been very much in evidence on these slopes recently.

—/ Bush fallowing however

Bush fallowing however can only be practised where land is plentiful.

MANURING. Since animals are normally penned near the homestead, due mainly to praedial larceny, transport of pen manure to the gardens if they be distant from the houselot becomes very expensive, and often laborious if no donkey cart is owned by the family. Pen manure is therefore very often used only on the kitchen garden at the homestead. Many peasants own no livestock and therefore have no pen manure. Some of these buy artificials e.g. one cultivator in the Northern section applies 3 lbs. superphosphates and a little potash annually to his citrus trees and also uses small quantities of artificials in his market garden at Aranguez. Artificials are not extensively used by the cultivators however but where pen manure is produced it is generally applied to the holding providing that it is not too far away from the homestead. One peasant in the Southern section used both pen manure and artificials, chiefly Sulphate of Ammonia. Another kept a cow, a calf and a donkey tethered on a manure heap and fed cut grass to them. Any uneaten grass was therefore trodden down as pen manure. Cheddae uses his pen manure in the kitchen garden and also applies urine which he collects in a tank. He uses Sulphate of Ammonia mainly on his tomatoes and pigeon peas. On Farfan's estate, 5 acres of grapefruit which are tended by a peasant receive 40 lbs. pen manure per tree annually in one application. This pen manure is purchased from Ramsaran's Dairy.

GRAZING. With the exception of Tucker's 5 acres there are really no grazing grounds on the area at all. Grazing is provided mainly by traces, verges of main and secondary roads and bunds between rice lots. Animals are either tethered or grass is cut and carried home to the pen. A good grass trace can provide a considerable

—/ quantity of fodder

quantity of fodder in the wet season but in the dry season provision of fodder is extremely difficult. This year (1947) the situation has been extremely serious due to prolonged drought. Tucker is attempting to produce his pasture, after clearing the bush, by repeated cutlassing of weeds to encourage grasses and other fodder plants which will stand up to repeated cutting back by grazing animals. The other dairy farmer in the Area (Mr. Ramsaran) obtains his supply of fodder from a lot of 25 acres at Piarco in the wet season and from a 10 acre lot at Caroni in the dry season. This fodder is carted daily by a lorry and 2 carts. The dairy herd is at present turned out in the early morning and late evening into a citrus orchard of 10 acres. When interviewed Mr. Ramsaran said he intended to bulldoze the citrus orchard flat and plant fodder grasses. This would appear to be a very good scheme but it is very doubtful whether it is feasible or not. Establishment of fodder grass on the bared subsoil will be extremely difficult if not impossible. At present no fodder grass is grown as a pure stand in the whole area.

CROPS.

In the Northern section cocoa, citrus, pigeon peas, tomatoes and ground provisions are the principal crops. Mangoes, tonka beans and coconuts are relatively unimportant. The usual variety of vegetables such as okra, seime, string beans, tomatoes, tannia, dasheen and eddoes, is grown in kitchen gardens. On the flat Southern area cane, rice and ground provisions are the main crops. Under irrigation okras, tomatoes sweet potatoes and various varieties of peas and beans are grown on some of the rice plots during the dry season.

- (1) Cocoa is really only produced on the Monastery lands by share-croppers. This cocoa is all derelict and is at present being rehabilitated. Yields at present

/ are extremely low

are extremely low and would appear not to be really worth the cost of transport and processing. These cacao plantations must be at least 80 to 100 years old and it is felt that the only means of improving such cacao is by replanting with modern selections such as I.C.S. clones. By cutting down all this cacao (which is well-nigh worthless in any case) and leaving the land under a ground cover for one or more years young cocoa could then be planted and it should be possible to keep out Witches' Broom Disease since this area is enclosed by hills. Great benefit would also be derived from a few years under a cover crop by increasing soil fertility before replanting. Part of the area however would not be worth replanting.

Cocoa prices change very rapidly. The most recent quotation is \$32.40 per fanega (110 lbs.).

- (ii) Citrus. No citrus is cultivated in the Southern section, with the possible exception of one or two trees in the kitchen garden. In the Northern section citrus fruits are grown by tenants both of 2 to 3 acre holdings and larger holdings. One of the larger holdings is a citrus estate of 28 acres. The owner considers his yield of 50 crates per acre, at 20 x 20 spacing, good. It is all grapefruit, mostly Marsh Seedless. All the fruit is sent to the Citrus Growers' Association centre in Port of Spain. Previously limes were also cultivated but these died out. Scale insects are the most serious pest on grapefruit, and control is effected by spraying with a pitch oil and soap emulsion. There seems to be little trouble from gumming disease. Pen manure bought from Ramsaran's Dairy farm is applied at the rate of 40 lbs. per tree. The whole 10 acres of Ramsaran's Dairy Farm is under grapefruit. The fruits are sliced and fed to the dairy stock. A peasant having only 2 acres has

the whole of this under oranges, interplanted with Julie Mangoes. The trees are 8 years old. There are three varieties viz. Valencia, Navel, and Parson Brown, all on sour orange stock. Most of the plants were obtained from St. Augustine Nurseries while some were budded by the peasant himself. Artificial fertilizer is applied at the rate of 3 lbs. superphosphate + a little potash (exact quantity could not be discovered) per tree annually. Most of this fruit, especially the last, appeared to be doing quite well, and giving good yields.

The orange trees which are at present being planted through the Monastery cacao in the writer's opinion can never be capable of producing a heavy crop. The soil has not been properly prepared to receive the young trees and the majority of them are overshadowed by the old cacao. The trees were being planted in some of the most ridiculous situations. Some were planted on small platforms of loose earth scarcely a yard square on the side of a steep slope while others were planted on banks overhanging the San Miguel Ravine. Others were planted in holes full of stones and rock debris. An example of the last which unfortunately does not show at all clearly is illustrated by the photograph below. The foot-rule shows the depth of the circular hole around the young tree to be between $7\frac{1}{2}$ and 8 inches.

(iii) Ground Provisions. Under this heading pigeon peas, tomatoes, various tubers and pulses etc. have been grouped. Fairly large acreages of pigeon peas are cultivated in the Northern sector. The areas over which they are grown are indicated on the cropping maps on pages 28 and 30. In one case it was found that pigeon peas were interplanted between tomatoes, the tomatoes providing some shade for the young pigeon peas, and allowing the pigeon peas to grow to sufficient size to provide a good ground cover by the time the tomato crop was over. Average yields of pigeon peas varied around 200-300 lbs. per acre. The peas are sold in the pod in the Port of Spain market, the price paid to the producer being from 6 to 8 cents per lb. This crop under proper management is a valuable one and provides a good return. Pigeon peas were also being interplanted with maize on the Eastern slopes of the Tunapuna valley. The peasant who cultivated this area was reaping his first crop after clearing the land from bush, and expected this plot to last for 4 or 5 years. No manure was being applied, and the sort of crop he will obtain in 4 years' time surely cannot be a profitable one. No soil conservation measures had been adopted. Pigeon peas were also being cultivated near the Churchill-Roosevelt Highway in the Southern sector. (See Cropping map page 30

- Ground Provisions)

Very little maize is grown in the area. Most of what is grown is confined to small plots for domestic use. In general yields were very low to medium. Application of manure in most cases would raise the yield appreciably. Tomatoes are cultivated both in the Northern and Southern sectors. The fruits are usually of rather small size and tend to be of inferior quality. Yields are low but the crop can be quite profitable due to the demand exceeding

—/ supply.

supply. Small quantities of artificial fertilizers are applied in many cases but no exact rate of application can be given since the cultivators in most cases scattered a small quantity around each plant from a tin. In the Southern sector farmers complained of blight on their tomatoes. Apparently no control measures were being adopted. Little trouble from blight seemed to be experienced in the Northern sector.

Other crops included under the heading Ground Provisions are sweet potatoes, yams, tannias, dasheens eddoes, plantains, seime, eggplant, cassava, okra and a few others. These are grown on a minor scale mainly for home consumption although one or two peasants do grow a sufficient quantity to have some for sale.

The area of ground provisions in the North East corner of the Southern section is both for home consumption and sale. Presumably the peasants in this small area started growing these provisions because Trinidad became so dependent on imported foods that the price of ground provisions shot up, supplies being irregular and small.

Marketing of Ground Provisions. Most of the peasants in the Southern section who grow sufficient ground provisions for sale take their produce by donkey cart to Port of Spain or San Juan markets and many also sell a proportion to the local shop. In the Northern sector however in many cases the produce is collected by marchands from Sangre Grande while in many cases it is sold in Port of Spain. Surprisingly enough very little is sold locally in Tunapuna, St. Augustine or to the local provision stores in St. Johns. In many cases produce is sold in Port of Spain market only to be purchased by the local storekeepers and brought back again usually by taxi. This adds unnecessary expense on to the price of the produce and reduces the storekeeper's profit. It seems that there is plenty of room

for improvement in marketing. A coöperative society would help greatly in this direction. As well as eliminating unnecessary middlemen produce could be sold fresh instead of half-dead and in poor condition after transport to and from the markets as well as a day of exposure in the market.

The photographs below show some of the crops.

XVII. Sweet potatoes grown in dry season. Notice the bare, dry and cracked banks on which they are growing.

XV. A good stand of pigeon peas on slopes below the Monastery.

XVIII. Sweet potatoes giving a good cover. Padi in the background.

(14) Sugar Cane. Cultural practice differs for peasant grown and estate grown cane and perhaps an outline of both systems would be instructive for comparison purposes. Estates are turning more and more to a highly mechanized form of cane-cultivation and nowadays graders, harrows and draining machines are employed on some estates. Mechanical cultivation in general however is to a depth of 12 inches in the

XVI. Okras grown under irrigation in the dry season on padi land. Dry season (January to June). The fields are laid out in parallel beds 22 to 24 ft. wide separated by drains. The

XVII.

beds are numbered

XVII. Sweet potatoes grown in dry season. Notice the bare, dry and cracked banks on which they are growing.

XVIII. Sweet potatoes giving a good cover. Padi in the background.

(iv) Sugar Cane. Cultural practice differs for peasant grown and estate grown canes and perhaps an outline of both systems would be instructive for comparison purposes. Estates are turning more and more to a highly mechanized form of cane-cultivation and nowadays graders, bankers and draining machines are employed on some estates. Mechanical cultivation in general however is to a depth of 12 inches in the dry season (January to June). The fields are laid out in parallel beds 22 to 24 ft. wide separated by drains. The

—/ beds are cambered

beds are cambered to allow runn-off in the wet season. Manuring is usually at the rate of 15 tons Farmyard Manure per acre where available. Artificials at the rate of 3 cwt. Sulphate of Ammonia per acre and potash + phosphate according to soil requirements, and filter press are also used extensively. Planting is done early in the wet season (July to September) and usually 3 weedings are done before the cane closes in. After harvest the trash is burned or allowed to remain as a mulch if it has not been burned off before cutting. Normally two ratoon crops are taken (4 years' cycle). Plant cane requires much more labour than ratoon cane, a rough estimate of costs being \$85 per acre for plant cane and \$9 per acre for ratoon crops. Yields can go up to 40 or 50 or more tons per acre though the average is more likely to be between 25 and 40 for estates and somewhat lower for peasant cane. Little or no cultivation is done by many cane-farmers since they prefer only to replant in blanks instead of taking a plant crop followed by several ratoons. Where plant crops are taken followed by anything up to 10 or 20 ratoons some cultivation is normally done. If the farmer does not possess oxen he will hire oxen from a neighbour and scratch his cane beds with a plough. Now he can hire mechanical tilling machines from estates. Planting is done April to May using cane-tops as planting material, saleable cane thus not being sacrificed. The plant crop is then reaped next dry season. Thus all the peasant's cane-land is reaped every year. Pen manure is applied to the cane when available and some of the farmers use artificials which may be purchased through the estate which buys their cane. Farmers' yields of cane are usually low seldom exceeding 20 tons per acre though one good canefarmer assured us he could get yields of 30 to 40 tons per acre.

Marketing of Cane. Cane is grown by the canefarmers by contract for the sugar estates (Orange Grove and Caroni). Usually a representative of the factory visits each contractor in November or December and estimates the tonnage of cane which will be produced. Having decided the rate at which cane should be delivered to the factory cutting permits are issued accordingly by the factory authorities. Due to the great expense of hired transport over a considerable period and to congestion at the sugar-mills many farmers surreptitiously burn their cane in order to get all the cane away at once since burned cane must be milled within 36 hours after burning. Hired haulage costs about \$2 per day and therefore is a big item in the expenses of the canefarmer. The sugar-mills usually pay 60¢ a ton less for burned cane but the loss to the farmer is more than counterbalanced by the saving on haulage. On the other hand accidental fire may be a great handicap to a small farmer who wishes to cart his own cane since he has to hire labour to get it off within 3 days after burning. After 3 days the factory need not and probably will not accept burnt cane. Numerous cane fires dislocate the work of other cane farmers since all other cane deliveries are suspended while the burned cane is being delivered and milled. The minimum price of cane is uniform throughout the island and is calculated by means of a complicated formula in which the price of processed sugar is the chief variable. This season the price of sugar delivered to Orange Grove estate has been \$6.24 per ton and \$6 per ton for undelivered cane.

- (v) Rice. Rice is only produced in the Southern section and is the most important crop. It is grown for home consumption and surplus padi is sold. It is the staple diet of the East and West Indians. Demand greatly exceeds production and the deficit is met by imports from British Guiana (formerly from Bengal). There is no estate rice in Trinidad.

—/ It is purely

It is purely a peasant crop. Acreage of padi cultivated by peasant families ranged from $\frac{1}{2}$ to 4 or 5 acres, the majority of peasants having only $\frac{1}{2}$ to 1 acre. At present there is no irrigation system for padi but the Drainage and Irrigation Department are now introducing one. The peasants by the river don't like it since they will now have to pay irrigation rates while they could draw water from the river free previously.

Preparations for the cultivation of padi are begun with the first rains. Nurseries are made usually in June or early July. A peasant with no oxen must either cultivate his padi-land by hand or hire oxen from a neighbour. The small plots are hand cultivated in any case. The land after ploughing is harrowed, levelled and puddled. Manures are used in some cases but manuring has been dealt with elsewhere. Seedlings are planted out in July when they are about 20 to 45 days old in clumps of 4 to 9 plants at 12 to 18 inch spacing. Weeding is usually done about a month after planting. The padi is then kept flooded until the grain begins to harden and then the water is allowed to run off. Harvesting is in November and December. The padi is cut by sickle about 6 inches above the ground and tied into sheaves which are carried to the bunds and allowed to dry slowly. Threshing is by beating on a lathe table or by bull-mashing. It is interesting to note that hand-threshing has been almost completely replaced by bull-mashing in British Guiana since the rice marketing board introduced a scheme whereby all rice is pooled. It does not now pay the padi farmers to produce the super grade white rice which they previously produced by hand-threshing. The padi is sun-dried and winnowed at home and stored in barrels. The padi is parboiled as and when required and taken to the local rice mills for milling. A charge of 12¢ per Kerosene tinful is made for milling. The offal is kept by the miller

—/ but may be

but may be purchased by the peasant at 5¢ per Kerosene tinful.

Yields of padi average 2,400 lbs. per acre the range being from 1,700 to 2,800 lbs. per acre. The peasants estimate their yields in barrels and kerosene tins per acre. (6 kerosene tins equal one barrel which equals 160 lbs.) They estimate 16 to 20 barrels is a normal yield while 24 barrels is a very good yield. One peasant who had a yield of 24 barrels per acre (3,840 lbs.) said his land was so rich that manuring would lodge his crop. These yields are for the main crop. Some of the padi-farmers produce a crop in the dry season, the yield being of the order of 8 to 10 barrels per acre. Others grow ground provisions in the dry season. The padi-farmers' yields compare quite favourably with and often exceed yields on the College rice-plots. (See Table II below).

TABLE II.

Producer	Yield per acre
Peasants	1,700 up to 2,800 lbs.
College Rice plots (1946-7)	2,400 lbs. with N.P.K.
St. Augustine Experiment Station	4,032 lbs.
Caroni (Bejuical)	1,600 up to 3,000 lbs.
Burma peasants	1,800 up to 2,900 lbs.
British Guiana	4,200 up to 5,000 lbs.

In British Guiana estates have been rented out by a proprietor and the padi produced purchased and milled. As already pointed out the padi was hand threshed and only super grade rice was produced. Anna Regina estate (3,500 acres) was bought by Government and rented out to padi-farmers. When hand threshing was practised only 3 to 5 acres could be managed by one padi-farmer and his family but now with bullmashing a padi-farmer can cultivate 7 acres. Cost of cultivation is not easily estimated since all the work is done by the family except where oxen are hired to plough the land. Allowing for the cost of family labour at the rates at which hired labour would be paid and cost of the family oxen or hired oxen the estimated cost of production of padi per acre is approximately \$70. This includes cost of preparation of nurseries and fields, planting, weeding, harvesting and threshing. The market price of padi is \$5.40 per barrel (160 lbs.). Taking as the average yield 2400 lbs/acre this represents an income of \$81 per acre. Added to this must be the value of the straw as stockfeed and organic manure, but even then the nett profit is very small and income must be supplemented by labour off the holding and by production of ground provisions in the dry season.

(vi) Other Produce. Although none of the peasants in the area keep bees I think honey production is worthy of mention since it is a possible means of increasing the peasants' income.

The Monastery of Mount St. Benedict possesses eleven apiaries and these seem to be extremely profitable. This year the yield has reached the record figure of 20 tons of extracted honey. Last year was a bad year when only 6½ tons were

—/ produced but in

produced but in 1926 the yield was 17½ tons and in 1942 the yield was 16 tons. Harvest is March to July. The honey is sold at \$8 per 4 gallon tin.

LIVESTOCK.

Nearly all the peasants keep livestock in one form or another. Most keep at least one cattle unit while others keep two or three or more cattle units. It has been tentatively suggested by Professor C.Y. Shephard in his "Survey of Peasant Agriculture in the Leeward and Windward Islands" that one cattle unit should be maintained per cultivated acre. The majority of peasants in the area fall far short of that standard however and therefore cannot produce sufficient farmyard manure.

Draught Animals. Draught animals are kept almost exclusively by the peasantry of the Southern sector, although several of the hill farmers keep donkeys. Draught work is done by horses donkeys and draught oxen in the cane and rice area. Draught oxen usually do the ploughing etc., while donkeys and horses are used for transport. Peasants try to obtain some form of concentrates for their draught animals but coconut meal is in the main only obtainable by those working for Orange Grove estate which can usually supply their needs in part if not wholly.

Cows and Calves. Probably about 50% of the farmers keep a cow, a cow and calf or two cows. There are two dairy farms in the Survey area which are worthy of mention although they are rather outside the term "peasant holding". Excepting these two dairy farms little milk is sold, it being consumed by the family fresh or in some other form such as ghee or as a curd. Some of the farmers however sell their milk and buy tinned milk for home consumption. Farmers having no cows buy either fresh or tinned milk. Yields are usually very low averaging less than 200 gallons per lactation. Perhaps a better supply of concentrates would go a long way in improving milk yield and

/ certainly up-grading

certainly up-grading of stock by servicing with bulls at the Government Stock farm should improve the performance of the progeny. Servicing is mainly by Government Stock farm bulls though one or two farmers possess bulls.

Tucker's dairy farm has already been mentioned elsewhere in connection with grazing. Twenty-four to thirty cows are kept and turned out on a 5 acres grazing lot adjoining the buildings. Fodder grasses and concentrates however have to be purchased elsewhere and transported to the farm. The milk produced is clean and of good quality. The dairy herd looks well, the cows having good skins and are not thin and bony as many of the peasants' animals are.

Ramsaran's dairy stock are all tuberculin tested. The ninety head of stock are comprised as follows:-

24 mixed and grade holstein cows.

63 heifers and heifer calves.

1 three year old pure holstein bull.

1 young holstein bull (17 months).

1 grade holstein 2 year old bull.

In addition there are 6 young bull calves.

The buildings are adequate and suitable for the present stock. At the present moment however the dairy buildings and equipment are in Curepe, which is a serious disadvantage. When the proposed alterations are carried out i.e. bull dozing the 10 acres of citrus orchard flat to make a grazing or exercise ground, new dairy buildings will be built on the premises and equipped with modern dairy utensils and new sterilizing and cooling plant. Future policy includes increasing dairy herd by keeping all good heifers and breeding from them. These heifers are to be mated to the bulls on the premises or to Government Stock Farm Ayrshire bulls. It is hoped that when the policy gets under way 1,000 gallons milk will be produced daily to supply government schools. This seems very ambitious since at present the daily yield is 55 to 60 gallons. Peasant cows

—/ which have a

which have a certificate of health are serviced at a charge of \$2. The stock are fed on 40 lbs. cut grass per head daily. This is supplemented by sliced grapefruit (about 10 per head) and a concentrate mixture of mainly coconut meal with bean meal, bran and palm kernel cake. Salt is given in the water. The condition of the cows was very good and the site appeared to be healthy. There were a few ticks. Neither the cows nor the bulls are at present exercised but will be under the new policy. The manure is sold to market gardeners.

Goats Sheep and Pigs. Few goats and no sheep are kept. Goats are invariably sold and are neither milked nor slaughtered. Pigs to the East Indian are unclean and therefore few are kept. Those that are kept are kept by West Indians or Christian peasants. The pigs are usually fed on scraps and rice-bran and other foodstuffs including waste fruits.

Poultry. Normally a peasant keeps a few poultry around his homestead. These are fed on scratch grains, corn or rice, supplemented by kitchen refuse. Birds and eggs are usually sold. Sometimes the mongoose and maniocou play havoc with the poultry.

Housing of Animals. Usually the animals are housed under a roof with open walls, if housed at all though one or two farmers were somewhat more enterprising and had built a very serviceable cattle shed complete with manure and urine channel behind the animals, the urine being led off to a storage tank. Such a shed is illustrated in plate XXIII.

The following plates illustrate the type of animals found in the survey area.

XIX. A typical donkey used for carting.

XXII. A peasant man and his wife gathered at the house.

XX. A good draught bullock.

XXIII. Example of better class cowshed.

XXI. A not-so-good draught bullock.

XXII. A peasant cow and heifer tethered at the homestead.

XXIII. Example of better class cowshed.

XXIII. Example of better class cowshed.

CONCLUSIONS AND RECOMMENDATIONS.

All over the survey area, especially in the Northern sector fertility was low. This would appear to indicate that advice to the peasants is very necessary on manurial problems. Demonstrations would help considerably to awake the interest of the peasants in the benefits of farmyard and artificial manures. In the Northern sector fertility could be maintained at a higher level if instead of burning bush that bush was allowed to decay and then incorporated in the soil. Legislation is strongly recommended here to prevent indiscriminate firing of bush. Not only does this destroy potential humus but also leaves the soil so completely denuded that it is very much subject to erosion. Also after heavy rains run-off is so great and rapid that the rivers become so swollen as to break their banks and cause flooding over a large area. The Caroni River causes great havoc by bursting its banks periodically and flooding huge acreages of land. Again legislation may be recommended to compel large landowners to carry out proper soil and moisture conservation measures. Where individual properties are too small to have efficient conservation measures then soil and moisture conservation should be Government responsibility, a small fee being charged to each landowner who benefits by the measures necessary in his particular locality.

The survey showed that secondary roads and traces were in a very bad state of repair and very often they become quite impassable in the wet season. Some of these traces are on privately owned estates and although the peasantry have repeatedly requested some sort of improvement the landlords concerned have not responded. The peasants were quite willing to share the expenses involved. Perhaps some form of village or community council would have been able to help in this matter but no such council exists. A large part of the survey area is extremely badly watered. In the Northern sector there are only 3 stand-pipes the rest of the water supply being taken from rivers and ravines. This is most unhygienic since sewage

/ finds its way

finds its way into the rivers and also clothes are washed in those rivers and ravines. The Southern sector may be in a somewhat more favourable position but is far from being satisfactorily supplied with water. There are 3 stand-pipes and a few draw wells. The responsibility for proper water supply surely rests with the Central Water Distribution Authority yet they seem to do nothing. Some investigation into the situation is necessary and should be undertaken on the peasant population's behalf.

In the writer's estimation legislation is necessary to prevent cultivation being carried on too far up hillsides and also to prevent cultivation on slopes which are too steep. The crests of hills should be left under natural vegetation as a water conservation reserve.

Fragmentation of holdings is serious in the Southern sector especially on Streatham Lodge estate. Inestimable benefits would accrue to the peasants if they could have their holdings in one piece instead of scattered small acreages all over the estate. The estate however is owned by absentee proprietors who seem to take no interest whatsoever in the estate except the collection of rent.

The available labour supply appears to be adequate over the area. Much labour potential however is lost due to fragmentation of holdings and homesteads being at considerable distance from the cultivated plots. This wastage could be substantially reduced by replanning so that each family has its land in one piece with the homestead built on that land.

The figures for cultivated and uncultivated acreages given in Appendix III show that little more than 50% of land held by the peasant population is cultivated. This low figure seems to result from shifting cultivation or bush fallowing. By good manurial practice this percentage could be raised considerably. Also by good manurial practice the soil would be more productive and therefore a smaller acreage per head of population would be necessary thus allowing people at present

without land to have their share also.

This survey has revealed the fact that a ridiculously large proportion of the farmer's time is spent in cutting grass from traces and pieces of waste land for his stock. A small acreage of fodder grass would save all the time wasted in searching for the small quantity of wayside fodder available and make that time available for more profitable employment. Such an acreage would benefit the farmer in other directions also. The land would benefit by the root penetration of the fodder grasses; the farmer would also be able to produce more farmyard manure on the holding instead of loosing it by tethering animals on traces. Probably the Department of Agriculture could do much by demonstration holdings to bring home to the peasant the value of fodder grasses in a rotation.

There is room for much improvement in the crops produced in the area. Better cultivation and attention to manures would increase yields considerably. The agricultural implements in use may be considered quite satisfactory and adequate under the conditions obtaining in the area surveyed. In the Northern sector a fork and hoe are practically the only implements used. Improvements could easily be achieved however in the crops of this section by contour planting and strip cropping. These methods would conserve moisture and prevent soil erosion, the effect of this being reflected in higher yields. As far as padi is concerned yields compare very favourably with those of the College Farm but the sample in many cases is extremely mixed. A seed selection programme would be very valuable. There are two rice mills within the area surveyed and several others nearby to which the farmers take their padi for milling. These mills seem to be very efficient but the cost to the farmer would probably be cheaper in a similar scheme to that operated on Anna Regina estate in British Guiana where a central rice mill is operated by Government through the Department of Agriculture.

The quality and yield of farmers' cane are very low. This

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is probably primarily due to the fact that in Trinidad cane farmers have been relegated to the unproductive and inferior cane lands which sugar estates have discarded. In contrast to this in British Guiana farmers' cane yields are just as good as the estate yields, the reason being that they have similar land to that of the estates and cultivate the same variety of canes as the estates.

Caroni estate has recently told the cane farmers who formerly contracted to grow cane for that estate that the management will no longer accept farmers' cane. This avoids the nuisance of receiving irregular supplies of inferior cane into the factory, but dispossession of cane farmers in Trinidad is not the solution to the problem since half of the total sugar production of Trinidad is by cane farmers. Some other solution must be found and found quickly. At least one step towards salvation should be the introduction of modern canes to the farmer and in addition the farmers should be advised as to how to cultivate their cane fields properly.

Livestock in general is very poor in Trinidad. Farmers' animals are usually thin and bony with poor coats. A lot of this is due to malnutrition but there is a definite need for improvement of stock. The Government Stock farm has several good bulls which are available for servicing farmers' cows. Many of the farmers make use of these bulls but many more who don't could easily do so.

A C K N O W L E D G E M E N T S.

I should like to express my sincere thanks to Professor A. de K. Frampton who gave much valuable advice and encouragement throughout the course of this work; and also to Professor F. Hardy for his advice and for his Department's help in analysing soil samples. I should also like to thank Dr. F.J. Pound of the Trinidad Department of Agriculture for the use of some of the Department's Crop Record Sheets.

REFERENCE.

1. PEASANT AGRICULTURE (An Economic Survey of the Las Lomas District, Trinidad).

By C.C. Parisinos, C.Y. Shephard and

A.L. Jolly. T.A. Vol. XXI. No. 5.

A P P E N D I X I.

Soil Profile of the College Rice Plot near Freeman Road.

	Depth in Inches.	Mean Pore Space.	S A N D		Index of Texture.	Normal pH.	Exchange pH.	Organic Matter. %	Nitrogen. %	C/N Ratio.	Available Nutrients.	Rate of Solution.	Available P ₂ O ₅ in p.p.m.	Available K ₂ O in p.p.m.
			Coarse.	Fine.										
1	2	41.8	1.0	30.6	35	6.2	5.3	2.53	.183	8.0	59	38	8	43
2	5	41.5	1.0	30.5	35	6.0	5.3	2.34	.161	8.4	59	31	8	-
3	8	36.6	1.2	36.0	31	7.4	6.7	1.58	.150	6.1	36	23	34	-
4	12	38.3	1.5	32.2	32	7.4	6.6	1.36	.131	6.0	37	8	17	-
5	18	38.4	1.3	35.2	31	6.7	5.6	1.36	.127	6.2	33	4	41	-
6	22	35.8	0.8	29.5	30	6.2	5.0	1.19	.130	5.3	32	6	21	-
7	27	38.5	1.4	30.0	32	5.7	4.6	1.09	.126	5.0	38	5	30	-
8	32	38.0	1.0	29.5	32	5.4	4.4	0.83	.100	4.8	-	-	9	-
9	39	29.1	1.8	46.6	19	5.3	4.7	0.33	.069	2.7	-	-	7	-
10	46	28.0	1.0	54.6	17	5.2	4.6	-	-	-	-	-	6	-

Description of Profile.

- A.1 Layer. 1., 2 .. Puddled blue-grey silt; abundant roots.
- A.2 Layer. 3., 4 .. Podsolised (ashey-grey) layer (pale olive-brown), speckled.
- A.3 -
B.1 Layer. 5. Transition.
- B.2 Layer. 6. & 7. Red mottled blue-grey crumbly silt. Haematite.
8. & 9. Oozing water. Orange mottling below; soft haematite concretions.
10. Orange & Crimson on white.

Soil-type. Probably Streatham Lodge Silt; Azonal; Hydromorphic.

Conclusions. Fine sandy-silt, acid in the A.1 Layer but unaccountably alkaline in the A.2 Layer; increasingly acid below.

Organic Matter and Nitrogen medium to low with very low ^C/N Ratio. Electrical Conductivity medium, denoting low salt content. Available phosphate and potash very low in A.1 Layer. Phosphate appears to have accumulated in the A.2 Layer below.

APPENDIX II.

Provisional Lower Limits of Adequacy. (After Professor Hardy.)

		INDEX OF TEXTURE I.T.	NORMAL REACTION pH	ORGANIC CONTENT %	C/N RATIO	TOTAL N CONTENT	AVERAGE P ₂ O ₅ p.p.m.	AVERAGE K ₂ O p.p.m.
CACAO	Sands, Loams.	10	5.5	3.0	8.5	0.22	30	100
	Silts, Clays.	25	6.0	4.0	9.5	0.25	30	175
SUGARCANE	Sands, Loams.	10	5.5	--	--	---	20	130
	Silts, Clays.	25	6.0	--	--	---	35	200

APPENDIX III.

(Summary in tabular form of information accumulated by investigation and by abstraction from Crop Record Sheets.)

Holding Number	Acreage Total A. R. P.	Whether Occupier Resident on property?	Whether Resident Within 1 mile?	Whether Property Worked entirely with family labour?	Family labour aided by hired labour?	Entirely hired labour?	What Livestock usually kept?	Any Accommodation provided for labour?	Distance from nearest driving road?	Particulars of transport owned?	Acreage Cultivated A. R. P.	Acreage Uncultivated A. R. P.
1	0-3-31	Yes	---	No	No	Yes	Poultry & 2 goats	No	On the road	None	0-3-31	0-0-00
2	3-3-01	No	25 ft.	No	Yes	No	None	No	On the road	None	1-3-00	2-0-01
3	16-0-00	Yes	---	No	Yes	No	10 pigs 2 cows, 1 ass, Poultry	No	600 ft.	None	16-0-00	0-0-00
4	9-3-36	No	1½ miles	No	No	Yes	None	No	On road	None	0-0-36	9-3-00
5	5-0-00	Yes	---	No	No	Yes	32 Dairy Cows and Poultry	Yes	On road	4 carts 1 van	5-0-00	0-0-00
6	1-0-30	Yes	---	Yes	No	No	1 cow, 1 goat, Poultry	No	On road	None	1-0-30	0-0-00
7	3-0-00	Yes	---	Yes	No	No	3 pigs & Poultry	No	On road	None	3-0-00	0-0-00
8	5-0-18	Yes	----	No	Yes	No	4 goats & Poultry	No	On road	None	5-0-18	0-0-00
9	6-1-05	No	8 miles	No	No	Yes	None	No	¼ mile	None	0-1-05	6-0-00
10	12-1-24	No	2 miles	No	No	Yes	None	No	On road	None	0-0-00	12-1-24
11	5-1-24	No	9 miles	No	No	Yes	None	No	½ mile	None	0-0-00	5-1-24
12	9-3-05	No	2 miles	Yes	No	No	None	No	¼ mile	None	3-0-00	6-3-05
13	22-2-21	No	8 miles	No	No	Yes	3 pigs & Poultry	No	On road	None	7-2-21	15-0-00
14	22-1-33	Yes	---	No	No	Yes	1 pig, 1 cow, Poultry	No	on road	None	8-1-33	14-0-00
15	6-1-27	No	2½ miles	No	No	Yes	Poultry	No	½ mile	None	0-0-27	6-1-00
16	14-1-13	No	---	No	No	No	None	No	1½ miles	None	4-0-00	10-1-13
17	14-3-33	No	8 miles	No	No	Yes	None	No	1½ miles	None	2-0-00	12-3-33
18	16-0-00	No	2 miles	No	Yes	No	None	No	¼ mile	None	2-0-00	14-0-00
19	16-0-00	No	3½ miles	No	No	Yes	3 pigs	Yes	¼ mile	None	3-1-00	12-3-00
20	5-0-00	No	2 miles	Yes	No	No	None	No	2 miles	None	4-0-00	1-0-00
21	5-0-04	Yes	---	Yes	No	No	1 goat 4 cows	No	on road	None	4-0-00	1-0-00

APPENDIX III. (Cont'd.)

(Summary in tabular form of information accumulated by investigation and by abstraction from Crop Record Sheets.)

Holding Number	Acreage Total A. R. P.	Whether Occupier Resident on property?	Whether Resident Within 1 mile?	Whether Property Worked entirely with family labour?	Family labour aided by hired labour?	Entirely hired labour?	What Livestock usually kept?	Any Accommodation provided for labour?	Distance from nearest driving road?	Particulars of transport owned?	Acreage Cultivated A. R. P.	Acreage Uncultivated A. R. P.
22	9-3-29	No	10 miles	No	No	Yes	None	No	1½ miles	None	6-0-20	3-3-9
23	7-3-00	No	9 miles	No	No	Yes	10 pigs & Poultry	No	On road	None	4-3-00	3-0-00
24	1-2-16	No	300 ft.	Yes	No	No	None	No	50 ft.	None	0-1-00	1-1-16
25	0-1-36	Yes	---	Yes	No	No	1 pig & Poultry	No	200 ft.	None	0-1-36	0-0-00
26	9-3-05	No	1 Mile	Yes	No	No	None	No	¼ mile	None	6-0-00	3-3-05
27	13-1-13	No	1 mile	Yes	No	No	None	No	500 ft.	None	4-0-00	9-1-13
28	16-0-00	No	1 mile	Yes	No	No	None	No	500 ft.	None	2-0-00	14-0-00

APPENDIX IV.

(Sample list of questions asked and answers received.)

1. Q. Is the land held Freehold or Leasehold or on a share-cropping basis.
A. Leasehold.
2. Q. Acreage held.
A. 6 acres.
3. Q. What is the rental.
A. \$7 per acre.
4. Q. Is the house the peasant's own or who built it.
A. Owner built and owned. (Remark. Very good.)
5. Q. Any permanent crops.
A. A few fruit trees. No bananas.
6. Q. Produce grown on houselot.
A. Yams, bananas, tannias, seime, breadfruit, tomatoes.
7. Q. Any cattle, goats, pigs or draught animals.
A. Poultry, 2 cows and 1 mule.
8. Q. Housing of animals.
A. One shelter.
9. Q. Feeding of animals.
A. Cut grass and coconut meal. Can't get anything else. (Coconut meal used to be \$1.20 per bag, now \$3.)
10. Q. Pen manure. Use and storage.
A. Stored in a heap and used in the garden. Urine stored in a tank for the same purpose.
11. Q. Poultry feeding and produce.
A. Fed on maize. Produce for home consumption and sale.
12. Q. Servicing of animals, breeding etc.
A. Cows taken to Government Stock Farm.

ACREAGES AND YIELDS.

13. Q. Hill padi.
A. No hill padi. 1 acre lowland padi. Yield 20 barrels per acre.
14. Q. Pigeon peas.
A. 1 acre planted in tomatoes. Yield 200 lbs. to 350 lbs. per acre.
15. Q. Citrus.
A. None
16. Q. Roots.
A. Small kitchen garden patch for home consumption only.

17. Q. Vegetables.
A. Small kitchen garden patch for home consumption only.
18. Q. Cane.
A. None.
19. Q. Any artificial manures used.
A. Sulphate of ammonia sometimes.
20. Q. Seed supply.
A. Own selection. (Remark. Quite a good sample.)
21. Q. Any outside labour employed.
A. Sometimes 4 or 5 employed when busy.
22. Q. Does the peasant work off the holding.
A. Sometimes. Reciprocal help.
23. Q. If so, what sort of work. Road-mending, cane-cutting, etc.
A. -----
24. Q. Marketing. Where and how sold.
A. To marchands from Sangre Grande and to local stores.
25. Q. Water supply.
A. Drinking water from public stand pipe.
26. Q. 14. 11 adults and 3 children.
A. Number in family.
27. Q. Any village council.
A. Yes, headed by the priest.
28. Q. Schools.
A. No children of school age.
29. Q. School garden.
A. -----
30. Q. Peasant's opinion of the school and school garden.
A. -----
31. Q. Are the kids going to be farmers.
A. Too young to make up their minds.
32. Q. Pests and diseases. Control of same.
A. Tomato blight and worms in pigeon peas. Peasant knew of no control.
33. Q. Vermin.
A. Twolegged. (This was the answer given.)
34. Q. Cultivation and farm implements used.
A. Cutlass and hoe.
35. Q. Storage of produce.
A. Rice in bins. Parboiled just before milling.