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ALTERNATIVE STRATEGIES FOR THE DEVELOPMENT OF GENEVA ESTATE

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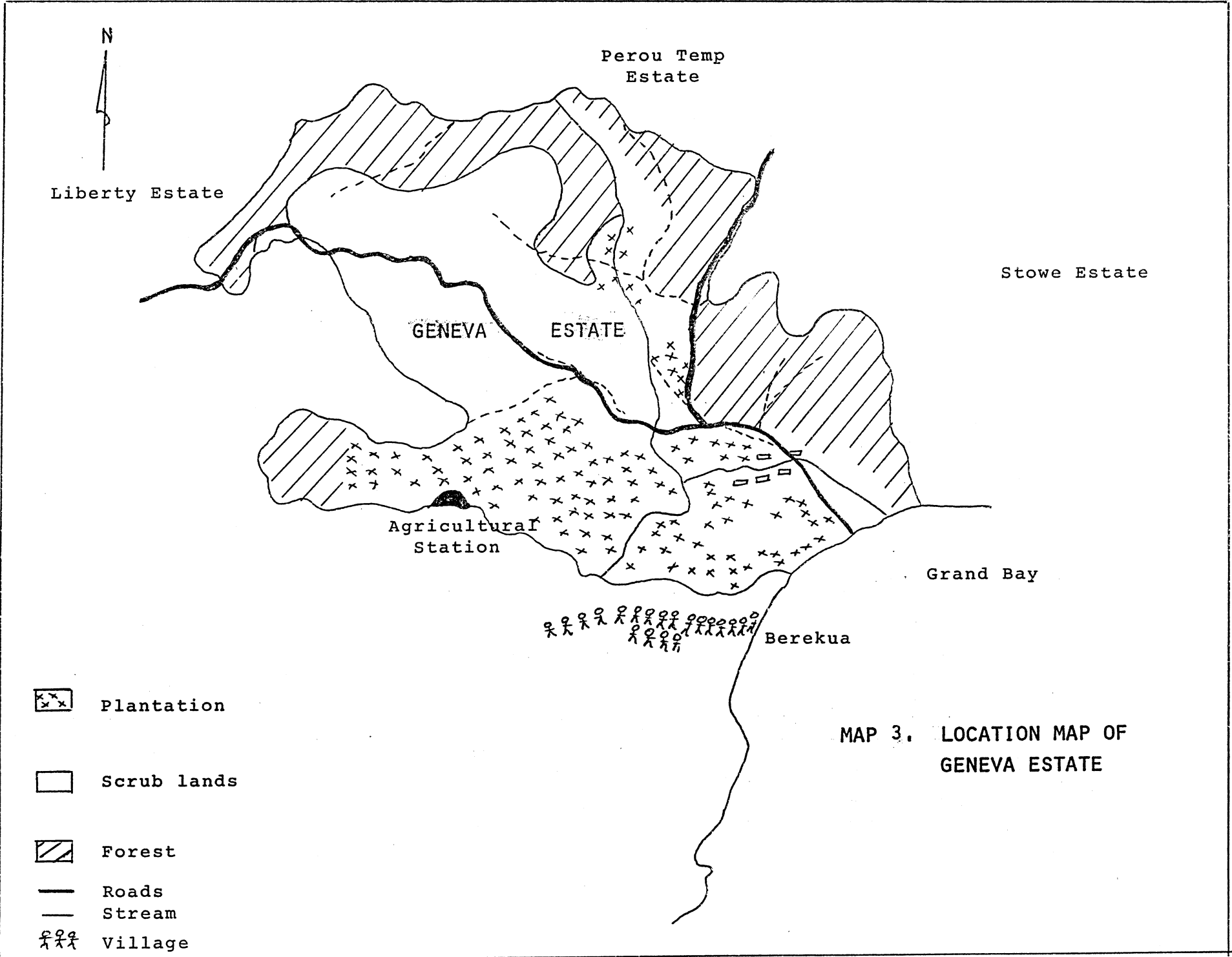
While the logic of the evaluations in earlier parts of this report might point towards the recommendation of a specific model, it is felt that this decision must be left to the village community itself, and no attempt should be made by external authority to impose a particular strategy, without the approval of the community. This approach would appear to be more than justified by the historical circumstances of the area.


Four possible models are discussed here and an examination is made of the pros and cons of adopting them. Before turning to the models themselves, the existing pattern of farming in the Grand Bay area is reviewed, a description is made of the physical and agronomic features of the Geneva Estate, and the present day land use, and the possibilities for future land use are discussed.


Existing Farming Patterns in Grand Bay


A complete survey of all residents in the Grand Bay area was conducted in late 1975 (Table 1). However, the officer in charge of the Census operation noted that residents of Grand Bay and Tete Morne showed a great deal of reluctance in being interviewed, because they expected to get land on the Geneva Estate. Two enumeration districts in Berricoa, and the District of Ravine Banane were the major defaulters in that respect. These areas, in the assessment of the surveyor, reflect an understatement of about 35 per cent, i.e., only about 65 per cent of the people in these districts were willing to give information. He felt, also, that the pattern which emerged from those who did give information is the same for the group which did not give information. To that extent, therefore, the figures must be used with some caution.


The Land Management Authority estimates that some 120 tenants occupy holdings on Geneva Estate. It is not clear to what extent respondents to this survey include the tenants on the Geneva Estate. It may be assumed, however, that at least some of the respondents were tenants on the estate. The rest would be farmers renting parcels of land on the steeper mountain slopes, and on other neighbouring estates. A significant number of farmers indicated that they owned the parcels of land they cultivated - a total of approximately 200, over the three farm size groups. The importance of the above information is that a very significant number of residents of the area already operate private holdings, varying in size from .01 acres, at the lower limit, to 40 acres at the upper limit. It becomes important to determine to what extent the existing tenants or *peasant proprietors* require more land





 Plantation

 Scrub lands

 Forest

 Roads

 Stream

 Village

MAP 3. LOCATION MAP OF GENEVA ESTATE

Table 1. Accumulated Farm Operator Profile, by Farm Size; Grand Bay, Dominica, 1975

Item	Farm Size			Total
	< 1 acre	1-<5 acres	5-<50 acres	
(numbers)				
No. of holdings	218	218	52	488
No. of parcels	227	337	107	671
Tenure: owned	88	93	32	213
rented	105	73	4	182
mainly owned	2	24	8	34
mainly rented	9	21	5	35
other	4	-	-	4
(acres)				
Net farm acreage	104.39	447.6	388.9	940.89
Range: upper limit	.83	5	40	40.00
lower limit	.01	1	5	0.01
Cultivated acreage	89.42	328.5	188.5	606.42
Range: upper limit	.75	1.47	3.25	3.25
lower limit	.13	.17	.9	0.13
(numbers)				
<u>Age Distribution:</u>				
Under 20 years	3	1	-	4
20-29	37	10	1	48
30-39	36	27	2	65
40-49	42	42	9	93
50-59	36	52	16	104
60-69	45	50	18	113
70+	14	26	5	45

Source: *Agricultural Census*, November-December, 1975.

for farming, and related to this, to what extent those who already own land could be classified among the unemployed and underemployed. It can be assumed that there will be a pressing demand, even from those who already operate holdings, for land on Geneva, and these people will have to be included in the programme of development of the estate. In the first place, most of these tenants would probably consider the holdings they operate too small to sustain them at a reasonable level of income, and secondly, they have the basic farming experience needed by the settlement in order to develop to its full potential. It needs to be observed that it is not likely that the farmers who already operate small holdings will surrender these holdings to take up full-time occupancy of the Geneva Estate. One important implication of this strategy will be to reduce the opportunities for settlement of the unemployed youth in the village.

The heaviest concentration of farmers is in the 40 to 60 year age group. There are only four farmers, according to the survey, in the under 20 age group and 48 in the age group 20 to 29. This confirms the generally held view that the youth are not actively engaged in agriculture.

Table 2 shows the pattern of production in the Grand Bay area, illustrating the heavy emphasis on food crop production, as compared with bananas. Production in the area is very diversified, with small quantities being produced of almost every traditional crop.

Table 2. Numbers of Farms and Acreages of Different Crops; Grand Bay, Dominica, 1975

Type	Farm Size			Total
	<1 acre	1-5 acres	> 5 acres	
	(acres)			
Vegetables	1.2	8.8	3.2	13.2
Food Crops	57.6	168.5	96.8	322.9
Specialist Crops ²	2.3	5.8	1.0	9.1
Tree Crops ³	27.8	151.4	181.9	361.1
Total	88.9	334.5	282.9	706.3
	(numbers)			
Vegetables	21	39	11	71
Food Crops	193	203	50	446
Specialist Crops ²	8	40	6	54
Tree Crops ³	122	173	45	340
Livestock	127	146	31	304
Total ¹	218	218	52	488

¹Categories are not mutually exclusive

²Includes cassava, arrowroot, ginger, sugar cane

³Includes bananas.

In the Census only 15 farmers admitted to selling their vegetables in the Roseau market, while two admitted to disposing of their vegetables in the village. According to the survey, no farmer sold to the Marketing Board. Similar responses were obtained in relation to food crop sales. The cageyness of the farmers about their sales might reflect their suspicion that such information is collected for tax purposes. Because of this, it is difficult to arrive at any definite conclusions as to the extent to which production of vegetable and food crops is consumed within the village or sold outside.

Physical and Agronomic Description of Geneva

Size of Estate and Physical Features

The estate covers approximately 1,380 acres. Bordered by the sea to the South, it extends approximately two miles inland. About half of its area is below the 500 foot contour, with slopes 5° to 10°, except for the sides of the waterways, mainly Stewart's River Valley. Further inland slopes are between 15° and 35°. The land rises to over 1,800 feet at its highest point, but the higher land averages just over 1,000 feet.

The Western area of the estate is made up of younger volcanic deposits, while the Eastern area is made up of more mature material. Between the two areas, and forming the major area of flat land, are the alluvial deposits of the river system.

Soil Types and Some Recommendations

(i) Soils of the valley bottom: These soils are a mixture of fresh water and saline greys of variable drainage quality, and some better-drained young soils. Natural fertility tends to be low, and there is little erosion hazard. The main problems are drainage and the presence of stones and boulders, the latter making some areas unsuitable for cultivation. Crops recommended include citrus, coconut, bananas and food crops.

(ii) Young soils of the valley sides and lower hills: Two soil types predominate - Grand Bay and Bostica, both on slopes tending to be mainly between 5° and 20°. The Grand Bay soil type shows rapid drainage. It, however, tends to be stony. While its natural fertility tends to be fairly good, areas under cultivation have been reduced to low fertility status. The soil tends to be deep and even though erosion should not be a major problem precautions need to be taken against it. Recommended crops include citrus, bananas, food crops, vegetables and improved grasses.

The Bostica soil is found in the higher Western areas. This tends to be low in fertility, and is not highly erodible. Drainage is very rapid through the soil, and its water-supplying capacity is low. The less sloping areas are well suited to agricultural purposes, while forestry is recommended for the higher and steeper slopes. With erosion control, the slopes of medium steepness are highly cultivable. Recommended uses include bananas, coconuts, citrus, food trees and vegetables.

(iii) Older soils: The latosolics show very rapid vertical drainage, and are subject to erosion, especially on the steeper slopes. Natural fertility is low, and concentrated on the top surface layers. Under cultivation, much of this top layer has been lost. With minimal cultivation and adequate anti-erosion measures, the slopes of less than 20° are suited to bananas, cocoa and citrus, the steeper slopes to forestry.

In summary, all the soil types show good drainage (with some exceptions in the alluvial types), and the physical structure is conducive to agricultural use. The presence of boulders and the degree of slope act as influential factors, however. Soils tend to be of fairly good to low fertility, due to high leaching. Fertility problems are amenable to management solutions.

Present Day Land Usage

One of the more important factors governing land use is rainfall, its quantity and distribution. Stowe, to the east of Grand Bay receives approximately 110 inches annually, 40 inches in the January to June period, and 70 inches in July to December. It is likely that the interior elevated areas of Geneva Estate receive higher rainfall, and the lower-areas nearer the sea somewhat less. The lower lying areas are marked by the stronger dry season, compared with the higher lands. Therefore, attention needs to be paid to one or more of the following: conservation of moisture-, irrigation, and the use of drought-resistant crops and grasses. The problem is aggravated by low moisture retaining capacity of the soils. The wetter areas, where tree crops, bananas, vegetables and grasses are all recommended, and the rainfall is 100 to 170 inches per annum, are the more favoured agricultural areas.

Present land use is: 250 acres limes, about 50 of which need replanting; 25 acres grapefruit; 250 acres coconuts and 13 acres bananas (see Map 3). Since the take-over by Government, food crops have been planted especially near the road, and on the valley sides. Approximately 40 per cent of the land is cultivated, and most of this land is to the south, except for a narrow strip running north, along the road and river bed. The remainder of the land is in forest, low forest woodland and about 200 acres of scrub.

The Estate was important formerly for livestock production. The owner kept cattle, estimated to be close to 35 head. In addition, tenants were allowed to tether stock on estate lands. It is estimated that at present 40 to 50 head, belonging to the villagers, now graze on the Estate. Geneva Estate and the surrounding Grand Bay area was estimated in 1975 to have populations of 300 cattle, 100 sheep, 100 goats and 200 pigs. The present chicken population is less than 1000, whereas in 1971 it was just less than 7000. The pig population has also declined from 1100 to approximately 200 head over the same period. The decline in the latter two populations is thought to be common to the Eastern Caribbean, and has been due mainly to increased prices of imported feeds.

The level of management of livestock at Geneva and the immediate Grand Bay area seems to have been uniformly low. Even on the Estate, where it could have been expected to be, and probably was, higher, there were no improved pastures. The fact that tenants tethered stock on estate lands indicates, however, that the latter had more forage than the surrounding areas. Farmers in the area, on interview, complained of difficulty in dry season feeding and in watering of stock. A request was made for grazing lands, since they were always paying poundage fees.¹

Sheep, goats and pigs were nondescript, generally. Some pigs were observed tethered in the coconut fields.

Scope for Livestock

There is a large domestic market for livestock which is satisfied, in the main, by imports from hard currency areas. Dominica loses considerable foreign exchange annually as a result of the deficiency in

¹ Anonymous (1975?). "Report and Recommendations for the Development of the Cattle Industry in Dominica."

local production of livestock, and policy must be geared to taking full advantage of the local production possibilities.

Up to the present, little attention has been given to the organised production of sheep and goats, and concentration on cattle, poultry and pigs has shadowed the need for investigation of the potential of the former. This is partly explained in terms of local tastes. However, if the production of sheep and goats can be demonstrated to offer a comparative advantage, particularly in relation to the use of limited landspace and feed costs, some effort should be made to bring about a change in people's tastes, in keeping with the trend in other areas.

The high cost of imported livestock feeds rules out emphasis on poultry and pigs at least for the time being, unless the latter can be satisfactorily reared on rejected bananas and coconut meal. Bearing in mind present land use, and the limiting factors of area and terrain, livestock development must complement the remainder of any agricultural programme. The acreage of rough and improved pasture, together with the land under coconuts, can form the basis of the livestock programme.

Grazing under coconuts is an established technique which has been widely practised in other Caribbean areas, in order to increase income from the unit area of land. In Trinidad output from livestock has become more important than output from coconuts, since copra yields have been declining. This decline may be due in part to lack of attention to the trees and competition from the cattle, but factors not connected with the livestock are thought to be more important.

There is the possibility of using at least part of the existing coconut acreage at Geneva for grazing cattle. The limiting factor is the possibility of damage to soil structure, and thus to the coconuts' performance on the areas of alluvial soil (especially those which are not sufficiently free-draining). In such areas, sheep production may result in less damage, and also more intensive land use.

The other potential area for livestock development is the 200 acres of scrub in the area North-South of the Mitchum River (around Fontaine Estate and Platine). Here, slopes are 10° to 20° . The area is a mixture of Grand Bay and Bostica soils, both deep, well drained, suitable for grasses, and not subject to any great degree of erosion. Its relatively higher elevation, 400 to 1100 feet, should assure a higher level of rainfall, probably just over 100 inches, and a less marked dry season. Infrastructural development costs are likely to be higher than developing grazing under the coconuts. Better access to the area is desirable, and land clearing is necessary. This area may also be used for coconut production. Grass planting could be delayed for several years and, by intercropping coconuts and bananas, the stage at which the coconuts are vulnerable to damage by cattle would be passed. Then the bananas could be replaced by grassland. The area is described as suitable for all these types of production.

In attempting to define other areas for livestock production, the land capability, but more so the existing land use, must be the determining factor. Existing permanent crops can hardly be removed in the short run. The grapefruit, lime and coconut areas must be re-developed, where necessary. Conflict in the use of land under the coconuts will be between grass and bananas and/or plantains.

The steeper slopes of the highland areas, variously estimated at 200 to 300 acres, will need to be left in forest, natural or planted, for watershed and erosion protection. While some consideration may be given to tree crops - bay, avocado or mango - in the area just below the forests.

Emphasis has been given here to livestock development, since this is relatively new in the area. Crop production, because of the suitability to the area, local knowledge and available markets, with a few exceptions, is likely to continue as at present, and even on extended acreages.

Alternative Strategies for Development

Basic Considerations

(i) Implications for the community: A development and settlement strategy that is not related to the hopes and aspirations of the community stands little chance of success. Consideration must be given to the two factions of the community alluded to in the sociological survey of Grand Bay - the young persons, who are strongly motivated towards the cooperative approach, and the older villagers, who favour individual units of land. The employment-generating capacity is also an aspect of development which must be considered. However, a solution that lays too great a claim on the scarce resources of the country will only benefit a privileged enclave, and should be avoided.

(ii) Income target: In order to determine farm size, in the case of a settlement proposal, or the number of participants, in the case of a cooperative approach, a target income must be set. This, of course, is always a controversial subject. However, an income of \$1,500 (representing net cash income after debt service and family labour) was decided upon. This approximates the possible gross annual earnings from the current wage rate of \$6 per day.

(iii) Social and political attitudes towards land tenure: The findings of the socio-economic survey of Melville Hall suggest that farmers prefer private ownership of land, but would be willing to accept a leasehold arrangement. The Government appears to be committed to a policy of leasehold tenure, and, as such, the proposals are based on leasehold.

(iv) Implications of the Castle Bruce Cooperative: Some wider implications of the Castle Bruce Cooperative, in relation to the development of Geneva, have already been mentioned. At this stage, we raise some economic considerations. The Castle Bruce Cooperative, with its very active publicity, is, no doubt, having tremendous demonstration effects on Grand Bay. The preliminary survey of Castle Bruce revealed that, although enthusiasm was still high and agricultural development on the limited land made available to the Cooperative was proceeding fairly well, there was still a gap between annual income and expenditure, which was a cause for concern.

There is little concrete information available on which to assess the financial performance of the Cooperative, but the information available¹ does suggest that the current viability of the enterprise is dependent on heavy external subsidies. On the other hand, bearing in mind the fundamental objectives of the Cooperative, the relative inexperience of the workers in management, and the short time which the

¹A.N. Williams and Evaluation Team, *Op. cit.*

Cooperative has been operating, it is perhaps not reasonable to expect the project to be self-supporting at this stage. Much of the investment of resources and time have been in capital formation, to enhance future productivity and the social aims of the Cooperative, and a period of several years might be necessary to determine economic performance. However, if the situation in which operating costs exceed gross revenue continues for too long, there must be cause for concern, since the Cooperative might be heading for a financial crisis.

This implies that, in determining to what extent Castle Bruce should be used as a model in developing a cooperative approach to the development of Geneva, two distinct sets of criteria must be used - (i) economic, and (ii) sociological. It is, at this stage, in terms of the latter that Castle Bruce offers a strong attraction for emulation.

(v) Community expansion and social infrastructure: The Grand Bay village was established in the mid-19th century, and during the intervening period no additional land has been made available for expansion. The population growth has led to severe fragmentation, and there is now urgent need for village expansion, to prevent the development of slum conditions. It is, therefore, proposed that 50 acres of marginal land from the estate be reserved for village expansion: this assumption is incorporated in the proposals considered below.

Proposals

In an attempt to provide scope for rational decision-making, the socio-economic implications of the following four possible alternatives are presented (Table 3): (i) government operated unit, (ii) individual leasehold settlement, (iii) cooperative unit, and (iv) cooperative-cum-settlement unit.

Table 3. Projected Results of Alternative Strategies for Development of Geneva Estate: Dominica.

Alternative	Acreage	No. of Settlers/members of Coop.	Loan Requirement (\$)	Hired Labour content (man-days)
<u>II. Settlement leasehold</u>				
A. 2.5 ac. units	300	120	96,000	-
B. 3 ac. units	300	100	180,000	-
	600	220	276,000	-
<u>III. Cooperative</u>	1,390	229	255,000	54,300 ¹
<u>IV. Cooperative and Settlement:</u>				
Cooperative	1,190 (625 arable)	122	55,000	25,600 ¹
Settlement	200	80	64,000	-
	1,390	202	119,000	25,600

See Appendix for the assumptions on which these projections are based.

¹The assumption is that all labour on the Cooperative will be hired.

The economic analysis revealed that each alternative would yield a rate of return in excess of 50 per cent, so this cannot be an important guide in the choice of an alternative.

Government Operated Unit - Alternative I

If the estate was retained by the Government and operated as a unit, this would conflict with the hope and aspirations of the community, since the people are adamant that the property should be brought under their control. It is also very doubtful that a government-operated farm could be insulated against political pressures, and as a consequence it could become a drain on scarce public funds. The labour force on such farms seldom bears any relationship to productivity, nor do receipts from farm output reflect any relationship to the value of real output. Accordingly, projections of costs and returns can hardly ever be realistic, hence they have not been submitted in this report.

Leasehold Settlement - Alternative II

The second approach is to utilize the estate for a leasehold settlement, and to lease the copra factory to a private operator. On the basis of the target income, two farm sizes are suggested: Model A - 2.5 acres, and Model B - 3 acres (Tables 4 and 5).

These models represent only two of a series of possible choices open to farmers. However, they do reflect a likely land use pattern that would emerge. A total of 220 farmers would be settled (120, on the basis of Model A, and 100, on the basis of Model B).

The cash flow reveals that there would be a loan requirement of EC\$800, for each farmer operating under Model A and EC\$1800 for each farmer operating under Model B. The farms would have the capacity to amortize these loans in 5 and 6 years respectively, and provide an average annual net cash balance of EC\$2,180 and EC\$1,700, respectively.

In spite of the fact that this strategy will directly benefit a large number of participants (Table 3) it may not be acceptable to those sections of the community who favour the cooperative pattern. Except for the copra factory, it is envisaged that only family labour would be utilized. Furthermore, the aggregate loan requirement is the highest of the four alternatives (Table 3). In addition, a public investment of an estimated \$160,000 would be required for farm roads and surveying. A full-time extension worker would also be required.

Cooperative Unit - Alternative III

The third approach is to organise the estate on a cooperative basis, with membership drawn from the community. The farm and agro-industrial development (see following section) would be integrated. The proposals for development, as shown in Table 6, include:

- expansion of coconut acreage from the present 250 acres to 450 acres, to allow for permanent intercropping of 250 acres with bananas;
- rehabilitation of 250 acres lime;
- establishment of 20 acres food crops;

Table 4. Farm Development Proposals for Geneva Estate, Alternative II Leasehold Settlement, Model A: Dominica.

Proposed Land Use		Development Schedule	
		Year 1	Year 2
Plantain	1 acre	1.0	-
Dasheen	1 acre	0.5	0.5
Tannia	.5 acre	-	0.5

Items	Year	1	2	3	4	5	6
<u>Output</u>		(tons)					
Plantains		-	6	4	2	4	
Dasheen		3.5	7	7	7	7	
Tannia		-	2.5	2.5	2.5	2.5	
<u>Value of Output (1)</u>		(\$)					
Plantains		-	1,920	1,280	640	1,280	
Dasheen		1,050	2,100	2,100	2,100	2,100	
Tannia		-	800	800	800	800	
Loan (2)		800	-	-	-	-	
TOTAL CASH INFLOW (3=1+2)		1,850	4,820	4,180	3,540	4,180	4,180
Capital Expenditure (4)		840	-	-	-	-	-
Recurrent Costs (5)		500	1,550	1,550	1,410	1,400	1,400
TOTAL CASH OUTFLOW (6=4+5)		1,340	3,270	2,630	2,130	2,780	2,780
<u>Debt Service (7)</u>		64	264	248	232	216	-
BALANCE (8=3-(6+7))		446	1,286	1,302	1,178	1,184	1,400
Value of Family Labour (a)		400	500	500	500	500	500
Net Farm Family Income (10=8+9)		846	1,786	1,802	1,678	1,684	1,900
Consumption (11)		400	500	500	500	500	500
Net Farm Family Income (12=10-11)		446	1,286	1,302	1,178	1,184	1,400

Table 5. Farm Development Proposals for Geneva Estate, Alternative II, Leasehold Settlement, Model B: Dominica.

Items	Year	1	2	3	4	5	6	7
<u>Output</u>								
Coconuts (nuts)		10,500	10,500	10,500	10,500	10,500		
Bananas (tons)		-	15	18	18	18		
<u>Value of Output</u> (\$)								
Coconuts		1,365	1,365	1,365	1,365	1,365		
Bananas		-	2,100	2,520	2,520	2,520		
Loan		1,800	-	-	-	-	-	-
TOTAL CASH INFLOW		3,165	3,465	3,885	3,885	3,885	3,885	3,885
<u>Capital Expenditure</u>								
Recurrent Costs		610	2,110	2,110	2,200	2,110	2,110	2,110
TOTAL CASH OUTFLOW		2,650	2,110	2,110	2,200	2,110	2,110	2,110
Debt Service		70	504	473	444	431	389	-
BALANCE		445	851	1,302	1,241	1,344	1,386	1,775
Value of Family Labour		1,000	1,000	1,000	1,000	1,000	1,000	1,000
Net Farm Family Income		1,445	1,851	2,302	2,241	2,344	2,386	2,775
<u>Less Value of Sub.</u>								
Consumption		400	500	500	500	500	500	500
Net Farm Family Cash Income		1,005	1,351	1,802	1,741	1,844	1,886	2,275

- establishment of 100 acres of bay trees;
- introduction of a dual-purpose cattle herd on 100 acres under coconuts;
- maintenance of existing 25 acres of grapefruits; and
- repairs to the copra factory, and construction of a bay oil distillery.

The establishment of bay oil and cattle enterprises warrants some discussion. In the case of bay, Dominica is one of the world's foremost producers. The crop is important, because it is adaptable to the more marginal lands, is labour-intensive, and is of agro-industrial value. The market for bay oil is now very sluggish, but indications are that it is improving.

In spite of the comparatively lower productivity per unit of land from cattle, as against a crop such as bananas, a dual purpose cattle enterprise is proposed, in view of its importance to the nutritional well-being of the community. Given the lack of expertise in dairying, and some doubt as to

Table 6. Development Proposals for Geneva Estate, Output of Alternative III, Cooperative: Dominica.

Item	Land Use		Development Schedule		
	Present	Proposed	Year 1	Year 2	Year 3
(acres)					
1. <u>Farm</u>					
Coconut	250	450	80	80	40
Bananas	13	250	80	80	77
Lime	250	250	50	100	100
Food crop	-	20	10	20	20
Grapefruit	25	25	50	100	100 (rehab.)
Bay tree	-	100	-	50	50
Pasture	100	-	20	40	40

Item	Year	1	2	3	4	5	6	7
<u>Output:</u>								
Coconuts (nut)		875	875	875	875	875	875	875
Bananas (ton)		78	584	1,224	1,846	1,987	1,894	1,721
Bay (ton)		-	-	-	-	150	400	550
Lime (barrels)		6,250	9,000	14,000	15,000	15,000	15,000	15,000
Food crops (ton)		50	100	100	100	100	100	100
Grapefruit (HBB)		4,000	8,000	9,350	9,350	9,350	9,350	9,350
Milk (qt.)		-	8,700	17,500	17,500	22,900	29,600	29,600
Beef (lb.)		-	-	-	5,100	5,100	6,600	12,350
TOTAL VALUE OF OUTPUT (\$)		195,370	321,210	458,660	557,330	613,070	664,300	694,290

2. <u>Bay Distillery</u>								
Bay oil output (lb.)		-	-	-	-	3,000	8,000	11,000
Value of Output (\$)		-	-	-	-	27,000	72,000	99,000
3. <u>Copra Factory</u>								
Copra output (tons)		175	175	175	175	193	230	271
Value of output (\$)		130,900	130,900	130,900	130,900	144,400	172,800	202,700
4. <u>Cattle Enterprise</u>								
Value of output (\$)		-	8,700	17,000	17,500	22,900	22,900	29,600

the stability of the estate for dairying, the more prudent approach would be to introduce a dual purpose herd - milking once per day, and selling bulkins at an average age of 15 - 18 months. Such an approach would provide training in dairying, and allow a smooth transition into pure dairying, should that prove feasible in the future. Pasture establishment is proposed only on freer draining soils on the existing coconut plantation in order to reduce compaction, which would otherwise adversely affect the performance of coconuts.

Table 7. Development Proposals for Geneva Estate, Cash Flow of Alternative III, Cooperative: Dominica.

Item	Year	1	2	3	4	5	6	7
<u>CASH INFLOW</u>		(\$)						
Loans		75,000	180,000	-	-	-	-	-
Sales - farm		195,400	321,200	458,700	537,300	613,000	664,300	694,300
- copra		130,900	130,900	130,900	130,900	144,400	172,800	202,700
- bay oil		-	-	-	-	27,000	72,000	99,000
TOTAL INFLOW		401,300	632,100	589,600	688,200	784,400	909,100	996,000
<u>CASH OUTFLOW</u>								
<u>Capital Expenditure:</u>								
Farm		77,200	136,000	85,500	30,000	34,100	28,100	-
Copra factory		12,000	-	-	-	-	-	-
Bay oil distillery		-	-	-	15,000	-	-	-
Sub-Total		89,000	136,000	85,500	45,000	34,100	28,100	-
<u>Recurrent Cost:</u>								
Farm		132,000	186,200	229,300	247,500	214,900	266,800	295,200
Copra factory		121,000	121,000	121,000	121,000	125,400	149,500	176,100
Bay oil distillery		-	-	-	-	19,000	49,000	67,000
Common services		51,000	19,000	23,000	23,000	23,000	23,000	23,000
Sub-Total		304,000	477,900	373,000	391,500	382,300	488,300	561,300
TOTAL OUTFLOW		393,200	613,900	458,800	436,500	416,400	516,400	561,300
Balance		8,100	18,200	130,800	251,700	368,000	392,700	434,700
<u>DEBT SERVICE</u>		4,000	16,000	52,400	49,800	47,280	44,720	42,160
Balance after Debt Service		4,100	2,200	78,400	201,860	320,720	347,980	392,540

The Cash Flow (Table 7) reveals that a loan of \$255,000 would be required to implement the proposals. The Unit would have the capacity to amortize this loan over a period of 10 years, with a two-year moratorium, and yield an annual average net cash balance of \$344,000, which could accommodate a maximum of 229 members. At full development, it would provide approximately 54,000 man-days of labour annually.

Cooperative-Cum-Settlement - Alternative IV

A combination of settlement and cooperative is perhaps the most appropriate solution, as it stands a better chance of meeting the aspirations of both factions of the community, thereby running less risks of human disruption. To this end, it is proposed to utilize 200 acres of arable land for settlement, and the remaining acreage (1,190 acres - 625 arable) plus the agro-industrial complex (copra factory and bay oil distillery) as a cooperative.

The settlement component is based on Model A (Table 4). Thus, with the farm size at 2.5 acres, a maximum of 80 individuals can be settled. The cash flow projections reveal that for implementation each farmer will require a loan of \$800, and that this could be repaid over a period of 5 years, leaving an average annual net cash balance of \$2,180.

The development proposals for the cooperative section are presented in Table 8. They are identical to those presented for Alternative II, except that there is to be: (a) no expansion of the present coconut acreage; (b) only 50 acres of bananas; and (c) a lower output of copra.

The cash flow (Table 9) indicates that a loan of \$55,000, repayable over 10 years, would be required to implement the cooperative proposals, and that the remaining average annual net cash balance of \$184,200 would accommodate a maximum of 122 participants.

Table 3 shows that while this strategy, in comparison to other alternatives, would result in a slightly lower number of direct beneficiaries, it would require from 50 per cent to 70 per cent less credit input, and would generate approximately 26,000 man-days of paid employment annually at full development.

Table 8. Development Proposals for Geneva Estate, Output of Cooperative Part of Alternative IV, Cooperative Plus Leasehold Settlement: Dominica.

Item	Land Use		Development Schedule		
	Present	Proposed	Yr. 1	Yr. 2	Yr. 3
	(acres)				
Coconut	250	250	-	-	-
Banana	13	50	37	-	-
Lime	250	250	50	100	100 (rehab.)
Food crops	-	20	10	20	20
Grapefruit	250	25	-	-	-
Bay tree	-	100	-	50	50
Pastures	-	100	20	40	40

Item	Year	1	2	3	4	5	6	7
Output:								
Bananas (tons)		78	326	400	400	387	337	287
Coconuts (nuts)		875	875	875	875	875	875	875
Bay leaf (tons)		-	-	-	-	150	400	550
Limes (barrels)		6,250	9,000	14,000	15,000	15,000	15,000	15,000
Grapefruit (HBB)		4,000	8,000	9,350	9,350	9,350	9,350	9,350
Food crops (tons)		50	100	100	100	100	100	100
Cattle Enterprise								
Output:								
Milk (qt.)		-	8,700	17,500	17,500	22,900	24,900	29,600
Beef (lb.)		-	-	-	5,100	5,100	6,600	12,350
Total Value of Output (\$)		195,370	285,090	343,300	354,890	373,470	399,520	412,690

Table 9. Development Proposals for Geneva Estate, Cash Flow of Cooperative Part of Alternative IV, Cooperative plus Leasehold Settlement: Dominica.

Item	Year	1	2	3	4	5	6	7
					(\$)			
<u>CASH INFLOW</u>								
Loans		55,000	-	-	-	-	-	-
Farm (value of Output)		195,400	285,100	343,300	354,900	373,400	399,500	412,700
Copra		130,900	130,900	130,900	130,900	130,900	130,900	130,900
Bay Oil		-	-	-	-	27,000	72,000	99,000
TOTAL		381,300	416,000	474,200	485,800	531,300	602,400	642,600
<u>CASH OUTFLOW</u>								
<u>Capital Expenditure:</u>								
Farm		32,200	57,000	38,500	6,000	8,500	-	-
Copra factory		12,000	-	-	-	-	-	-
Bay Oil distillery		-	-	-	15,000	-	-	-
Sub-Total		44,700	57,000	38,500	21,000	8,500	-	-
<u>Recurrent Costs:</u>								
Farm		160,200	192,700	196,200	199,000	197,700	192,000	214,000
Copra factory		121,000	121,000	121,000	121,000	121,000	121,000	121,000
Distillery		-	-	-	-	19,000	49,000	67,000
Common service		51,000	19,000	23,000	23,000	23,000	23,000	23,000
Sub-Total		332,200	332,700	340,200	343,000	360,700	385,000	425,200
TOTAL		376,400	389,700	378,700	364,000	369,200	385,000	425,200
Balance		4,900	26,300	95,500	121,800	162,100	217,400	217,400
<u>DEBT SERVICE</u>		3,000	4,400	11,400	10,840	10,280	9,720	9,160
Balance after Debt Service		1,900	21,900	84,100	110,960	151,920	207,680	194,240

Supporting Industrial Activities

Whatever land settlement strategy is adopted, the Geneva Estate would be too limited to either employ the available community labour force, or meet the basic nutritional needs of the whole community.

Thus, in addition to maximising use of the estate by the selection of the best alternative farm plan and development of the best cropping pattern, supplementary labour-intensive agro-industrial and other projects must be developed to absorb the labour force.

The basic service functions can be expected to provide some measure of employment, as the community develops. The construction industry, nursing and health services, postal and banking services, etc., will create increasing opportunities for employment. However, these will remain limited, and agro-industrial activities will have to be developed to provide the main supporting source of employment for men and women in the village. For a community as small as Grand Bay, it is not difficult to identify a number of industrial projects which can absorb surplus labour and use existing raw materials. The possibilities are there,¹ and the main requirement is a motivated population to take advantage of them.

Handicraft

The Grand Bay area has traditionally been the major source of supply of the raw material for Dominica's handicraft industry. Up to the present time, however, no effort has been made to develop the production of the final handicraft products in the area, and Grand Bay has remained the source of supply of the raw material for the manufacturing enterprises established in Roseau. While there can be no merit in building up the handicraft industry at Grand Bay, at the expense of the existing firms in the capital, it is clear that the local handicraft industry is barely touching its potential, and there is considerable scope for expansion of the production of functional handicraft items throughout the island, for local sale and for export. Young women in the Grand Bay area are familiar, for instance, with the technique of weaving of straw, and in certain cases, manufacturing the basic units which are woven into mats, bags, etc. An industrial school must be developed in the area to train young women in the manufacture of the final products. This should, ideally, be done in cooperation with the established handicraft enterprises in the capital. The production of the straw material can be developed on the Geneva Estate itself, without encroaching on lands earmarked for other crops.

Coir Products

A small, pilot factory, manufacturing coir products, was initiated in Dominica in the early 60's, and, with the assistance of a Japanese expert, provided training in production and processing of coir fibre and in the manufacture of rope, mats and brushes. Despite the early efforts and promise of this industry, it closed with the departure of the expert. This is unfortunate, because Dominica is a net importer of large quantities of these products from countries as far away as Taiwan. The Grand Bay area produces large quantities of coconuts, the basic raw material for the development of this industry. Early efforts should be made to recruit the services of an expert in this field, to develop the production of brushes and brooms, mats and rope again for local sales and for export.

¹ See R.L. Williams, *The Industrial Development of Dominica*, for further reading.

Furniture and Woodcraft

The densely forested Grand Bay area provides much potential for the development of a localised furniture and woodcraft industry. In fact, Grand Bay is a recognised source of high quality local woods for furniture enterprises established in the capital, and there are some accomplished wood-sawers resident in the Grand Bay area. Paradoxically, in a rural community which is so underdeveloped, most households are equipped with furniture of all descriptions, bought at high prices from the stores in the capital, while carpenters and woodworkers remain unemployed. Investment in the basic machinery and equipment required for the development of a versatile woodcraft centre is relatively small, and immediate attention must be given to the development of this industry at Grand Bay.

A Garment Industry

With a population of over 2,000, the Grand Bay community offers some small scope for the development of a local garment factory, employing about 10 young women. As skills develop, the operation could be expanded to take advantage of the wider local market.

Lime Juice and Lime Oil

The Geneva Estate is a large producer of limes, which have, up to the present time, been sold fresh to the factory in Roseau. There are at least two lime producers' cooperatives in other villages in Dominica which operate modest extraction plants, and sell the lime juice to local exporters. The facilities and equipment required for extraction of juice are simple and inexpensive, while offering the opportunity for some employment, and an increase in the revenue-earning potential of the crop, by the value added from processing. Consideration should be given to establishing a processing unit on the Geneva Estate, for the production of lime juice and lime oil.

Wine-Making

Grand Bay is not a large producer of fruits which are normally associated with the wine-making industry. However, there are a number of short-term crops, such as passion-fruit, which provide an excellent base for the manufacture of wine on a cottage scale, and the possibilities of developing wine-making at Grand Bay should be investigated.

One important advantage of all the above activities is that they lend themselves to the cooperative approach, and should thus have appeal to the youth. However, industrial activity of any kind is fraught with many pitfalls, and the potential of any one of the industries identified will have to be studied, in relation to available technology, markets, etc.

One approach would be to construct a large shed in the area, to be used initially as a community and training centre for the youth. As the skills are developed, in one or the other area of activity suggested, then commercial production could be undertaken, eventually transforming the centre into a complex of productive enterprises, with centralized services.

Appendix. Assumptions Used in Calculating Costs and Returns for Geneva Estate;
Dominica.

Crop	1	2	3	4	5	6	7
A. Cost of Production per Acre (\$.)							
Coconut - Existing	170	170	170	170	170	170	170
- New	200	120	120	120	140	150	170
Bananas	680	500	500	530	500	480	450
Grapefruit	160	320	374	374	374	374	374
Limes - rehab.	120	120	120	120	120	120	120
- maintenance	100	100	100	100	100	100	100
Bay	350	60	60	110	200	220	250
Plantain	840	300	300	160	(Recurring in that order on re-		
Dasheen	800	800	800	800	800	800	800 replanting)
Tannia	700	700	700	700	700	700	700
B. Crop Yield per Acre							
Coconut - existing (nuts)	3,500	3,500	3,500	3,500	3,500	3,500	3,500
- new (nuts)	-	-	-	-	1,500	3,000	4,020
Bananas (tons)	-	6	8	8	8	7	6
Grapefruit (HBB)	160	330	374	374	374	374	374
Limes (barrel)	25	50	60	60	60	60	60
Bay leaf (tons)	-	-	-	3	5	6	7
Plantain (tons)	-	-	4	2	4*		
Dasheen (tons)	7	7	7	7	7	7	7
Tannia (tons)	5	5	5	5	5	5	5
C. Prices of Output							
Coconut (¢/nut)		13					
Bananas (¢/lb.)		7					
Grapefruit (\$/half bruce box)		3					
Limes (\$/barrel)		7					
Bay leaf (¢/lb.)		5					
Plantain (¢/lb.)		16					
Dasheen (¢/lb.)		15					
Tannia (¢/lb.)		16					
Beef - liveweight (\$/100 lb.)		90					
Milk (\$/qt.)		1					
Copra (\$/ton)		748					
Bay oil (\$/lb.)		9					
D. Technical Co-efficients - Cattle Enterprise							
Calving rate (%)		80					
Calf mortality (%)		10					
Culling rate (cows)		increases from 10% in year 3 to 20% in year 6 onwards.					
Carrying capacity (cows)		2 acres per animal unit					
Average daily milk yield		3 qt./cow					
Average liveweight of bulkins sold (lb.)		500					
Average weight of yearling heifers sold (lb.)		350					
Average weight of cull cows (lb.)		800					
Beef price - liveweight (\$/100 lb.)		90					

*average