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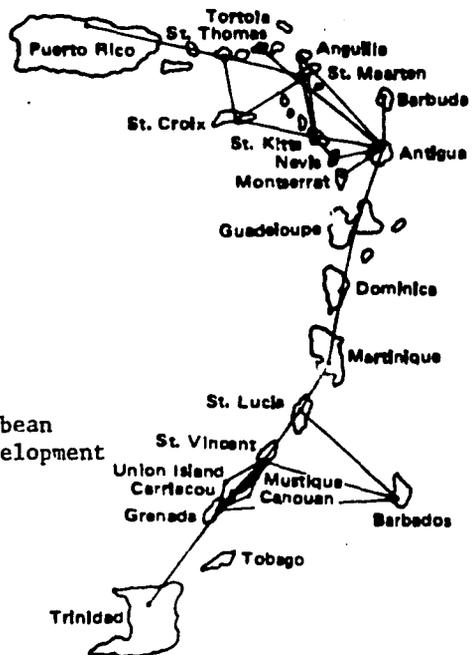
DESIGN CONSIDERATIONS FOR THE CARIBBEAN REGIONAL
BASIC NEEDS TRUST FUND PROJECT (BNTF)

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EVALUATION STUDY OF THE
CARIBBEAN REGIONAL BASIC HUMAN NEEDS/
EMPLOYMENT PROJECT (538-0030)
AND
CARIBBEAN EDUCATION DEVELOPMENT,
SCHOOL CONSTRUCTION/REHABILITATION
SUB-PROJECT (538-0029)
and the
DESIGN STUDY OF THE
FOLLOW-ON PROJECT TO BE
CARIBBEAN BASIC HUMAN NEEDS TRUST FUND

Economist

The consultant will be responsible for the following:

- (a) Assisting RDO/C and CDB staff in developing appropriate selection criteria for sub-project identification;
- (b) Utilizing existing reports, memoranda, etc., as well as field travel and consultations, determine the general regional levels of under and unemployment as well as specific national levels of under and unemployment in participating countries;
- (c) Estimate the economic outputs, including labor impact, by category of sub-projects (e.g. water systems, schools, clinics, etc), which are determined to be eligible for financing;
- (d) Define the economic cost-benefits ratios of sub-projects for selected sub-projects and develop a methodology which can be utilized in project implementation for determining how and when cost benefit analyses should be undertaken for sub-projects; and
- (e) Describe the macro-economic milieu in which the proposed project will be operating.

EXECUTIVE SUMMARY AND RECOMMENDATIONS

1. Unemployment as a percentage of labor force is currently at 17.7% in the region and represents approximately 40,000 people. It is highest among the 15 to 24 age group.
2. Economic benefits from social infrastructure sub-projects can be identified, but quantification in standard cost-benefit analysis is difficult. We estimate that about 32,000 man-month of employment will be generated by the new project.
3. A formula is presented to give effect to employment generation objectives of the project in a rational manner that favors higher employment levels at lower wage levels. Application of the formula would permit limited Cost Benefit Ratio analysis. Application of economic analysis to some water system activities is also illustrated.
4. A systematic method is given of identifying sub-projects for Basic Needs funding involving Multiple Criteria Utility Assessment. We recommend the technique for designing the BNTF Project and similar activities in the future.
5. We collected information on about 180 proposed activities in seven countries broken down as follows: water - 28^{1/2}%, health - 21%, education - 28%, roads and drainage - 5%

1/ All figures are approximate.

and others-18%. One hundred and fifty-six (156) of these are analyzed in terms of explicit criteria and rank ordered by country on their Total Utility Score.

6. We describe constraints, specific and generic, operating to limit routine maintenance of infrastructure sub-projects. Some possible reforms are examined, and a Maintenance Systems Development Component is outlined.

7. In addition, we suggest:

a) that country allocations of BNTF funds be made as follows:

Basic Allocation: US\$750,000 each plus a Premium Allocation based on these factors: BHN Completion History, BHN Labor Content Achieved, Project Supervision (Designate) Qualifications, and Average Total Utility Score.

b) that population not be an allocation factor in as much as it penalizes countries that are seriously trying to limit their population problem. 1/

c) that A&E consultants not be permitted to charge twice for the same building plans. 1/

d) that countries with in-house design capability receive a proportionate share of the Project Support funds which would otherwise go to consultants

e) that host governments be encouraged to exercise their priorities among all their eligible sub-projects.

f) that countries unwilling or unable to organize local involvement and self-help for new construction activities provide a paid caretaker and adequate physical security for each school, clinic, or other building funded. 1/

g) that a pre-condition for disbursement be a separate Project Account in each participating country.

h) that a special evaluation be scheduled around mid-point of the Project to assess maintenance of the predecessor Basic Human Needs infrastructure and the maintenance component of BNTF.

8. Finally, we endorse the following recommendations put forth by D.W. Boyd, C/CPO in April 83:
- a) that a financial person be included in the CDB Project group
 - b) that Project Supervisors meet every six months with USAID and CDB
 - c) that sub-project materi needs be combined for bulk purchasing where practical
 - d) that source and origin requirements be relaxed for greater implementation speed
 - e) that no mobilization advance be issued until a construction contract is actually signed.1/

1/ View not held unanimously by the team.

INTRODUCTION

1. This report presents findings, analyses, and recommendations to assist AID's Regional Development Office/ Caribbean (RDO/C) and the Caribbean Development Bank (CDB) in planning a Basic Needs Trust Fund (BNTF) for eight countries of the Eastern Caribbean and Belize.

2. Group Seven, Inc. (G7) feels particularly well qualified to contribute to the success of this follow-on project in as much as two of the three team members were involved in the evaluation of the predecessor Basic Human Needs Employment Project (BHN) in the Fall of 1983.

3. The Project Identification Document (PID) (signed in October 1983) envisages a three-year project with essentially the same thrust as BHN, i.e.: to rehabilitate and construct additional basic physical infrastructure to meet social and economic needs, and in so doing to create favorable employment opportunity. The PID additionally plans a technical assistance (TA) component to develop "national level maintenance awareness and capabilities".

4. The AID/W Guidance Cable stresses maintenance as a central issue and mentions its institutionalization as an objective. The cable also alludes to indirect labor impact and to sub-projects which could contribute to private sector development.

5. G7's Scope of Work is included in the Appendix. Basically, it called for us to: describe the economic situation in the area, estimate the economic outputs of the project, illustrate use of cost-benefit ratios, develop a rational selection system for sub-project identification, travel to seven (7) countries and country lists of eligible sub-projects, recommend implementation tactics, analyze relevant maintenance procedures and propose maintenance reforms and a maintenance system development component. We had 94 man-days to carry out this work.

REGIONAL ECONOMIC MILIEU

This section presents an overview followed by some country specific descriptions.

Overview

1. The Commonwealth Caribbean consists of sixteen (16) dispersed nations with a total population of about five (5) million. The More Developed Countries (MDC's); based on national income levels, comprise about 4.4 million people. The Less Developed Countries (LDC's), which include the Windward and Leeward Island chains and Belize comprise about 660,000 people. The two island chains Windward and Leeward, have formed together in a separate East Caribbean Common Market (ECCM).

2. The Windward Island group is composed of Dominica (the largest in terms of area), St. Lucia (the largest in terms of population) Grenada and St. Vincent and the Grenadines. These islands are generally rugged in topography, have abundant precipitation and lush tropical vegetation.

3. The Leeward Island group is composed of Anguilla (the smallest in all senses), Antigua (the largest in both area and population), Montserrat and St. Kitts/Nevis. These islands are generally flatter and drier with lower bushy-type vegetation.

4. Belize, formerly British Honduras, is located on the west coast of Central America. It maintains strong relationships with the ECCM countries through the Caribbean Community (CARICOM) and the Caribbean Development Bank (CDB). These data are detailed in Table 1.

5. The small size of the countries as measured either by natural resource endowment, physical size, or population are major constraints to satisfactory economic development and self-sufficiency. With only very small domestic markets, it is not possible to be self-sufficient in a broad range of products, except at highly in-efficient levels of production. Therefore, these countries are, and will continue to be forced to specialize in the production of a very limited range of goods and services, and to depend heavily on foreign importation. With the advent of tourism in the late 1960's and early 1970's these countries were forced to open their economies - first for their visitors, and then for their own people in terms of imported goods. This was done while their own production remained concentrated heavily in agricultural exports.

6. The inflation and world economic recession which ensued in the 1980/82 period has had a serious adverse impact on the economies in the Caribbean region. All the above countries are predominantly dependent upon imported petroleum for their main source of energy. Most are also now heavy importers of foodstuffs as well as most of their manufactured goods. During

TABLE 1

POPULATION, AREA AND GDP

	Population (1982E)		Land Area	Gross Domestic Product-1982	
	(000)	%	sq. miles	Millions US\$	US \$/Capita
<u>Windward Islands</u>					
Dominica	76	14.9	288	63.4	859
Grenada	91	17.9	132	80.1	756
St. Lucia	115	22.0	237	120.2	1053
St. Vincent	97	19.1	149	71.8	741
<u>Leeward Islands</u>					
Antigua	77	15.1	170	112.0	1493
Montserrat	12	2.4	37	26.3	2192
St. Kitts	44	8.6	110	53.2	1236
SUB-TOTAL	512	100.0	1123	526.7	1015
Belize	145		9390	121.7	839
TOTAL	659		10513	648.4	977

the same period, the principal exports of the region - sugar, bananas and coconut products - have either experienced a decline in demand due to the recession, or declining prices because of exchange rates and increased competition from other LDC's.

7. Table 2 indicates the actual amounts of Gross Domestic Product (GDP) at factor cost. This is the amount contributed by each sector before indirect taxes are added. It should be noted that the per-capita GDP expressed in factor cost is somewhat lower (the extent depending upon the local rate of indirect taxation), than per-capita GDP at market prices.
8. To reduce the vulnerability of their economy on agricultural exports, and to lessen somewhat the dependency on imports, these governments have sought to expand their industrial sectors.* Table 3 also presents the percentage of employment that each sector contributes to the GDP. Information on all the countries was not available. The general pattern is shown - with Agriculture still dominantly employing approximately 35% in the Windward Islands, but much less important in the Leeward Islands which have recurrent dry periods. For the region, although showing some growth, manufacturing remains very small, both as a percentage of the GDP and as a contributor to employment.
9. The manufacturing sector in the region has been limited mostly to small project for import substitution - soft drink bottling,

*Note: The five year percentage change in GDP at constant prices indicates the net result of these government efforts to-date.

TABLE 2

GROSS DOMESTIC PRODUCT - 1982
AND FIVE YEAR GROWTH

	<u>Agriculture</u>		<u>Manuf./Mining</u>		<u>Construct.</u>		<u>Tourism/Trade</u>		<u>Government</u>	
	<u>(Dollar amounts expressed in Millions \$EC)</u>									
	\$	% ^{1/}	\$	% ^{2/}	\$	%	\$	% ^{3/}	\$*	% ^{4/}
<u>(% = five year growth in constant prices)</u>										
<u>Windward Islands</u>										
Dominica	50.7	-14	13.2	+89	14.0	+76	15.6	+93	45.0	+34
Grenada	52.9	n.a.	5.7	n.a.	14.7	n.a.	23.7	n.a.	66.7 ^e	n.a.
St. Lucia	44.1	-1	34.0	+32	32.9	+88	58.0	+108	75.4	-43
St. Vincent	29.3	+33	21.3	+103	22.4	+16	22.6	+75	39.2	-77
<u>Leeward Islands</u>										
Antigua	20.9	+77	17.0	+101	24.4	+31	73.6	+39	54.1	+33
Montserrat	3.3	+38	4.5	+92	6.8	+39	16.2	+11	18.7	+45
St. Kitts	27.9	+67	19.0	+49	9.8	+48	18.9	+203	29.4	+139
SUB-TOTAL	229.1		114.7		124.1		228.6		328.5	
Belize	125.4	0	23.0	+6	18.1	-4	38.2	-5	52.7	+17
TOTAL	354.5		137.7		142.2	+96	266.8		381.2	

* Government includes electricity and water utilities

1/ Crops only

2/ Manufacturing only

3/ Tourism only

4/ Government only

TABLE 3

GDP/1982 AS A PERCENTAGE
AND RELATIVE EMPLOYMENT

	<u>Agriculture</u>		<u>Manuf./Mining</u>		<u>Construct.</u>		<u>Tourism/Trade</u>		<u>Government</u>	
	%GNP	%EMPL	%GNP	%EMPL	%GNP	%EMPL	%GNP	%EMPL	%GNP	%EMPL
<u>Windward Islands</u>										
Dominica	30.7	40.0	8.0	7.2	8.5	11.8	9.5	8.3	27.3	16.7
Grenada	25.4	35.2	2.7	6.2	7.0	13.2	16.2	9.7	32.0e	13.6
St. Lucia	14.1	33.9	10.9	9.4	10.5	8.2	18.6	8.7	24.1	14.4
St. Vincent	15.6	na	11.4	na	12.0	na	12.1	na	21.0	na
<u>Leeward Islands</u>										
Antigua	7.2	9.5	5.8	7.0	8.4	11.2	25.3	22.0	18.6	18.7
Montserrat	4.2	10.4	9.8	10.1	10.0	15.6	22.4	13.2	24.3	41.5
St. Kitts	19.2	29.9*	13.7	18.0	7.1	2.8	13.7	8.4	21.2	22.7
Belize	39.6		7.3		5.7		12.1		16.6	
Region	24.0		8.2		8.5		16.4		21.5	

* St. Kitts has nationalized the sugar industry; the amount of employment which would normally be 'government' is therefore understated.

beer brewing, concrete blocks, cookies and biscuits, etc. There has been some emphasis on agricultural product processing - coconut for soap in Dominica, spices in St. Lucia and Grenada. This follows the tradition of sugar processing and rum manufacture, and cotton processing inherited from colonial times. However, export markets are largely undeveloped at present.

10. To create employment, a concerted effort is being made to attract 'enclave' export industries. St. Lucia has set up a 'free port' and other nations are trying to streamline their import/export procedures to allow for more 'intermediate' processing of manufactured goods under the Caribbean Basin Initiative regulations. St. Lucia also allows fabric in duty-free if it is to be used for manufacturing purposes. AID is assisting such efforts through its sponsorship of a Project Development and Promotion (PDAP) program. Also, there is an ongoing project to invest in factory shells and offer local entrepreneurs development bank credit through CDB.

Unemployment and Employment

1. Even with positive efforts on the part of AID, World Bank, and other donor agencies, unemployment in the region has continued to grow. This is partly caused by population growth and partly by the demography of the region - with increasing numbers of youths seeking their first job. Young people who might formerly have chosen agricultural employment no longer consider this choice

to be attractive or perhaps even viable. Present policies regarding: land tenure systems, lack of vocational training for agriculture, and pricing and marketing policies for agricultural produce make the choice of agriculture for a livelihood unappealing.

2. Until recently one alternative to being unemployed was to seek out ways to emigrate. Throughout the decades of the 1960's and 1970's the work force showed a declining rate of participation - mostly as a result of emigration, and partly because of a sexual bias by women not to seek the lowest level, i.e. agriculture etc., for their employment. This same sort of phenomenon was experienced by the MDC's in the 1970's.
3. As a matter of definition - in a subsistence economy there is little or no unemployment. That is, everyone is earning his keep - albeit at a very low economic level. However, as these economies move into the modern age, and universal literacy is sought through general education policies, the wage level expectation for the newcomer to the job market becomes, marginally, the GDP per capita, and practically the GDP per employed worker.

As an indication of the trends in the labor force and the labor force participation rates for each of the countries, Table 4 indicates data available from the ten year interval national/regional censuses.

TABLE 4

LABOR FORCE

	1970 Census Data						1980 Census Data					
	<u>Labor Force</u>			<u>Participation</u>			<u>Labour Force</u>			<u>Participation</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>M</u>	<u>F</u>	<u>T</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>M</u>	<u>F</u>	<u>T</u>
<u>Windward Islands</u>												
Dominica	13210	7961	21272	79	42	57	16698	8635	25333	81	43	61
Grenada	17482	11200	28682	75	39	55	19312	12328	31640	83	47	64
St. Lucia	18652	10336	28988	79	35	55	23422	14439	37861	83	45	62
St. Vincent	15203	8528	23731	77	34	53	na			na	na	
<u>Leeward Islands</u>												
Antigua			21800	83	41	60	17246	11132	28378	73	41	56
Montserrat	2554	1434	3988	79	36	56	2850	2006	4856	79	51	64
St. Kitts	8064	4989	13053	74	37	53	9739	6655	16394	85	50	61
Belize	26816	5937	32753	84	18	55	31782	8024	39806	98	30	65

* Data from Antigua not Census Data but estimates from Grossman Report/ILO

5. The labor force has been defined as the number of people who are 'economically active' in the population. Since the basic design of the Census Questionnaire follows that of a developed country, there is some disagreement about the accuracy of such data in the environment of the Eastern Caribbean.

6. The 'economically active' population is defined as those people who worked (the employed), who looked for work, and those who had a job (vague) but were not working at the time of the Census. There may have been some difference in perception between the time of the two census periods which is also an influencing factor. Nevertheless, the 1980 Census (to-date) has indicated that there is a growing Labor Force and increasing participation rates. 'Participation rate' is the percentage of economically active in the total population within the ages of 15 to 65. With recognition that the basic data derived from a decennial census are not solely directed at the question of employment, one must utilize it as the best available. Therefore, the unemployment rate - those 'seeking work' and those 'who would work, if the opportunity presented itself' is presented in Table 5.

7. Indications from those census reports which were available indicate that the unemployment among males in the region stood at about 15%, and among females at 20% at the time of the census. Since this census was in theory all to be taken during April 1980, and in fact, was taken at different times in different countries, the data are not strictly comparable. However, there

TABLE 5

UNEMPLOYMENT RATE
By sex for 1960/1970/1980

Census Data:	1960			1970			1980		
	<u>Male</u>	<u>Female</u>	<u>Both</u>	<u>Male</u>	<u>Female</u>	<u>Both</u>	<u>Male</u>	<u>Female</u>	<u>Both</u>
<u>Windward Islands</u>									
Dominica.	4.4	3.5	4.0	6.2	8.4	7.0	16.1	22.4	18.3
Grenada	7.3	9.0	8.0	7.4	12.6	9.4	16.3	21.2	18.2
St. Lucia	9.3	8.9	9.1	8.3	11.1	9.3	15.7	19.5	17.2
St. Vincent	6.2	6.3	6.2	9.8	13.0	11.1			
<u>Leeward Islands</u>									
Antigua	12.8	11.4	12.3	9.7	16.0	12.0	21.3	19.9	20.7
Gerrard	11.8	12.1	11.9	3.2	7.3	4.6	11.0	15.8	13.0
St. Kitts	6.9	10.2	8.2	4.2	6.7	4.2	10.4	15.3	12.4
SUB-TOTAL	7.9	8.0	8.0	7.8	11.6	9.2			
Belize	na	na	na	4.8	3.9	4.7	14.3	11.4	13.6

is every reason to believe that the overall rate - about 17% - 18% for both sexes - has not materially decreased to this time. In a survey published on February 12th in the Barbados Sunday Advocate, the unemployment rate for 1983 was indicated at 15.8%, the highest since 1977 when it reached 16.3%.^{1/} Among females, the 1983 rate in Barbados was estimated at 21.7%, up from 16.5% for the previous year.

8. The unemployment situation in Barbados is of course influenced by in-migration from the LDC's - notable the ECCM countries. But the root cause of the problems, which are also affecting the fledgling industries in the ECCM, are the measures recently taken by both Jamaica and Trinidad regarding import restrictions from the ECCM area. These MDC's represented a substantial market, with their larger populations.

Underemployment

1. Unemployment is the most extreme form of labor underutilization. The prevailing criterion for heads-of-household, or primary labor force, is one of need. He/she must work, and does not have the option of looking to job for personal satisfaction. Therefore, in accepting any job that is available, and in many cases jobs which are not fully productive, he is underutilising his potential productive capacity. The forms of under-employment are various:
 - working for fewer months of the year than willing to work
 - working for fewer hours per week than willing to work

^{1/} Used as an indirect indicator only, since Barbados is not in the BNTF Project.

- working for less than the minimum wage of production value.
- working in jobs which require lower qualifications or less training

2. These are sometimes categorized into 'visible' under-employment (the first two above) and 'invisible' under-employment (the latter two). Where the labor force comprises large proportions of persons working on their own and/or casual basis (market hawkers, small shop traders, cottage craftsmen, etc.) the concept of visible under-employment is not very meaningful. These people customarily put in long hours during the day. But their net gain - the rewards of their labor - are often far less than they might achieve in a more organized environment. This is the 'invisible' underemployment in its most disheartening form.

3. Another form of 'under-employment' from an economic standpoint is the large component of the labor force that is made up of ^{School Leavers.} new graduates searching for their first job. While technically unemployed, many of them find some sort of odd jobs to earn a little pocket money. But this population, which has attained a higher educational level (on average) than their predecessors exhibit a great deal of particularity when choosing whether they are willing to accept work. As opposed to heads of households, these secondary members of the labor force have less urgency in their need for regular employment. There is considerable concern that if they accept just any job which does not have the income, status, or working conditions which they desire, they may remove themselves from better opportunities later on.
Drs. Brana-Shute conducted an indepth survey of this attitude

for AID - especially as regards the realization of expectations as evidenced by the results achieved by earlier entrant groups.

4. To understand fully the impact of these 'expectations', as well as to realize that the under-15 year population is an important consideration in the LDC Caribbean (on average between 40% and 45% of the total population). Table 6 gives representative unemployment rates by the two significant age groups - 15 to 19 and 20 to 24 for those countries for which comparable data are available.

5. As has been mentioned earlier, the alternative to unemployment/ underemployment for these age groups in the past has been to seek a route of emigration. With the present changes in immigration policy in the U.K. and U.S., that avenue would apparently be foreclosed.

TABLE 6

UNEMPLOYMENT BY AGE/SEX

Youth Groups vs Total

		<u>Age 15 to 19</u>		<u>Age 20 to 24</u>		<u>All Ages</u>	
		Male	Female	Male	Female	Male	Female
<u>Windward Islands</u>							
Dominica -	1970 Census	28.7	29.6	4.6	9.2	6.2	8.3
	1980 Census	49.8	66.7	19.9	30.4	16.1	22.4
Grenada -	1970 Census	27.8	46.7	11.2	16.9	7.3	12.4
	1980 Census	49.4	66.3	23.0	30.9	16.3	21.2
St. Lucia -	1970 Census	28.4	33.2	7.5	11.9	8.2	10.9
	1980 Census	49.2	57.0	18.0	26.6	15.7	19.5
St. Vincent -							
	1970 Census	34.2	43.5	12.2	12.5	9.6	12.8
	1980 Census	na	na	na	na	na	na
<u>Leeward Islands</u>							
Antigua -	1970 Census	na	na	na	na	na	na
	1980 Census	na	na	na	na	na	na
Montserrat -							
	1970 Census	11.9	26.6	1.4	5.3	3.2	7.3
	1980 Census	26.1	41.4	8.2	15.5	11.0	15.8
St. Kitts/Nevis -							
	1970 Census	16.3	26.0	5.0	6.8	4.2	6.6
	1980 Census	33.1	42.4	11.6	18.6	10.4	15.3
<hr/>							
Belize	1970 Census	18.7	12.9	4.3	1.5	4.8	3.9
	1980 Census	na	na	na	na	na	na

ECONOMIC
COUNTRY PATTERNS

DOMINICA

1. Dominica, with population of 74,000 (1980 census) and a GDP per capita of \$359 is one of the least developed of the Eastern Caribbean states. The economic infrastructure is considered to be substandard, relative to the other islands. The country's rugged topography and adverse climatic conditions regarding rainfall, produce high economic infrastructural costs. The progress on a multi-financed road linking the major airport to the main urban area and increased possibilities of internal communication may help to alleviate one of the major problems. A possible re-alignment of the small aircraft airport adjacent to the capital city is also being studied.

2. After a year's post-hurricane recovery, 1982 saw only moderate economic growth. Agricultural output, chiefly the export crop, bananas, increased only marginally. Coconut oil and soap, another important export product, were constrained by newly imposed restrictions in the chief markets, Jamaica and Trinidad. As can be seen from the table below, the exports from Dominica scarcely supply significant foreign exchange to cover imports. Unlike some of the other islands, tourism, another potential foreign exchange earner, is sharply limited by the lack of beaches, and the level of rainfall.

BALANCE OF TRADE
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Caricom-%</u>		<u>Major Trading Partners</u>			
		<u>Exp.</u>	<u>Imp.</u>	<u>EEC (UK)-%</u>		<u>US & Puerto Rico-%</u>	
				<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
129	20.4	60.7	26.6	35.8	28.3	6.5	26.6

3. The manufacturing sector is small, contributing roughly 5% of GDP. Most of the enterprises are locally owned, and involve agro-processing and small amounts of import substitution. Due to its geographic distribution of population, the human resource base for larger scale operations is very limited. The Gross Domestic Savings was estimated by the World Bank at 28.4%. This reflects the continued high rate of inflow from donors for project related public assistance.

4. Unemployment according to the 1981 census was 18.3%. The rate among males - 16.1% was only slightly worse than that experienced on St. Lucia where there is more economic activity. The rate among females - 22.4%, was the highest indicated. Especially noteworthy was the extremely high unemployment rate among females ages 15 to 19 years - 66.7%. This reduces somewhat at ages 20 to 24 to 30.4%, but is the highest for the region.

GRENADA

1. Grenada, with a population of 90,821 had an estimated GNP per capita in 1982 of \$756. Under the previous Government, and following a UNDP physical development plan, there was a high level of investment in infrastructure. This included a \$110 million EC jet-port, main feeder roads, and building and housing construction after the hurricane damage of 1979/80.

2. The economy is based on agricultural exports - accounting for about 90% foreign exchange earned. High quality cocoa (from 2 to 2.5 thousand tons) has been the most important foreign exchange earner of over 40% (see Table below). The output, however, has varied due to weather and general market conditions. Almost as important are: nutmeg, mace and clove spices (from 2.5 to 2.5 thousand tons). The market has been depressed recently due to competition. A long-term contract with the USSR was therefore negotiated in 1982. Lastly, bananas are also important (11 to 17 thousand tons). All products are marketed through government marketing boards, who reserve up to 85% of the export price for operations. Great fluctuations in world market prices for these commodities have lately discouraged agricultural producers.

3. Imports are 25% food stuff, 33% consumer durable goods, and 112% capital goods for investment.

BALANCE OF TRADE *
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Caricom-%</u>		<u>Major Trading Partners</u>			
		<u>EEC(UK)-%</u>	<u>US & Puerto Rico-%</u>	<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
136	34.6	11.5	32.8	77.2	23.0	3.2	19.4

* data for year 1980 - last year of comparable data published by CARICOM

By 1982, imports had been reduced approximately 10% from 1980 levels, and the export/import percent had increased to 80.2%. Tourism, only 2.5% of GDP, is largely undeveloped. At present, more than 50% of Grenada's tourist visitors stay in cottages or guest houses.

4. The manufacturing sector is small, and is oriented almost exclusively towards the home market and basic consumer goods industries (beer, soft drinks, sugar products, coconut meal, and clothing). There is some furniture production, but this has not been exploited for export. At present, there is little foreign investment, with the exception of vacation home ownership.

5. Unemployment showed a rate of 18.2% at the 1982 census. However, among those employed, only 64.4% were employed 'year round'. The government was the largest employer, with some 35.0% of those employed. However, private sector employment was a strong 31% - indicative of the strength of this sector as a contributor of almost 60% to GDP. The unemployment among the age 15 to 19 year group was typical of the Windwards, at 49.4% among males and

66.3% among females. The situation did not improve as much as in the other islands for the next group, ages 20 to 24, with male unemployment at 23% and female unemployment almost 31%.

ST. LUCIA

1. St. Lucia has a population of about 112,000 (1980 census; not official), about 40% urban and an estimated 1982 GDP per capita of \$1053. The economic infrastructure includes two (2) good airports - one adjacent to the main urban area, Castries, and a modern jet-port at the other end of the island. It also includes two (2) up-graded port facilities. In recent years increased water supply, first class tourist complexes, and factory shells have been financed through external investments, loans and grants. Road maintenance, however, remains a serious problem. In 1982 and 1983 GDP resumed a modest growth pattern of 2 to 3% per year. This mostly attributed to a recovery in the tourism and manufacturing sectors of the economy.
2. Exports of goods, mostly bananas, coconut oil, paper and paper boards, clothing and beer, cover about 40% of the import bill (see Table below) which equal GDP at market prices. However, the sun and sandy beaches create an active tourist sector that is the most important foreign exchange earner. On the import side, foodstuffs still account for some 25% of total.

BALANCE OF TRADE*
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Caricom-%</u>		<u>Major Trading Partners</u>			
		<u>Exp.</u>	<u>Imp.</u>	<u>EEC(UK)-%</u>		<u>US & Puerto Rico-%</u>	
		<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
321	38.7	38.1	22.5	33.2	22.0	23.6	33.0

data for year 1980 - last year of comparable data published by
CARICOM

3. The Manufacturing sector is the most important of all the islands, producing not only for inter-island export, but also with enclave industries oriented towards intermediate processing. Promotion of private sector activities in manufacturing is one of the highest priorities of the Government. Their National Development Corporation - an industrial development agency - has offices in New York and Cologne to seek and attract foreign investments. Recently a Duty-Free Zone was created away from the main urban center of Castries to attract such industry and limit inner-island urban migration.
4. The labor force participation rate in St. Lucia shows growth from 10 year earlier levels. This is probably attributable to the dynamic manufacturing sector growth. However, St. Lucia has a population which is highly skewed towards the young - almost 45% under age 14, and 60% under age 25. Unemployment is high among the youth - with almost half the males unemployed (49.2%) and over half the females (57.0%) in the 14 to 19 year age group. This drops about in half for the next age grouping - from 20 to 24 years. But in total, results in an overall unemployment of about 17.2%. The population is projected to double by the year 2000. Recent stagnation in the opening of additional enclave facilities might be nearing an end, with several major plants being announced currently.
5. Gross Domestic Investment was estimated at 42.3%. This is down from a high of nearly 60.0% - which reflected the intensive investment for the Hess Oil trans-shipment facilities. Over the longer

term, it should return to an average more representative of the other islands - based on concessional loans and grants.

ST. VINCENT

1. St. Vincent and the Grenadines, with a census population of 97,000 (1980) is one of the least developed of the Eastern Caribbean states. The 1982 per capita GNP was \$741. The economic infrastructure is considered adequate to attract additional capital investment from abroad, the port and the airport having been recently improved. The development of the hydro-electric potential for additional electricity generation, and a possible extension of the airport to accept long-range jet aircraft are under study.

2. The economic performance deteriorated in 1982/3, mostly because of some problems in banana production, its major export. The continued weakness of the pound sterling relative to the dollar also adversely affected the economy, as the UK is the market for St. Vincent's banana production. The second most important product, arrowroot, which was formerly used as a starch in the production of copying machine paper, has suffered stiff competition from other producers (Brazil) and cheaper substitutes developed in the U.S.

3. From the table below, the considerable exportation to the Caricom region is evident. St. Vincent has one of the most active manufacturing sectors, representing over 11% of GDP, and is only surpassed by St. Lucia among the islands in absolute amount. Considerable

expansion in enclave industries has also taken place in recent years. The relatively low wage rates compared to the other islands has been a strong incentive. About 3000 new jobs have been created since 1979, and a possible 1000 more jobs are in process of negotiation.

BALANCE OF TRADE *
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Major Trading Partners</u>					
		<u>Caricom-%</u>		<u>EEC (UK)-%</u>		<u>US & Puerto Rico-%</u>	
		<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
125	55.4	51.6	27.6	41.7	27.6	2.5	20.4

data for year 1979 - last year of comparable data published by Caricom

Unemployment as estimated by the World Bank and the St. Vincent Labour Commission remains at a high level: between 20 and 25% of the labour force. However, the upswing in activity after the two natural disasters - a volcanic eruption and a hurricane in successive years - should have had some effect towards alleviating this problem.

5. The Gross Domestic Investment was estimated at 25.7%, as a result of continued high inflows of project-related public assistance. While previously in-balance on their current account, the Government's late 1981 wage settlement with civil servants at about 50% of salaries has caused a deficit. A wide range of new tax measures, including a controversial 3% turn-over tax, have been instituted to bring in the needed revenue. The resultant higher wage levels

throughout the economic system, and the combined effect of turnover tax multiples, could have an adverse effect on additional job creation. (This should be of some concern since the general population is expected to double (to 200,000) by the year 2000, and the number of young job seekers to increase even faster.)

ANTIGUA

1. Antigua officially estimates its population at 77,200 (1982). There has been no census since 1960, and therefore this estimate is based on projections from 1960 using birth, death, and migration records. At the official population rate, Antigua would have a GDP per capita of \$1493. After Montserrat, it would be next below Barbados in terms of economic development.

2. Antigua has a reasonably well-developed infrastructure to serve its present population. The port serves as a cruise ship stop-off, as well as a regional trans-shipment center. A new jet port serves as the hub for tourist traffic from Europe and the US ^{Bona} for St. Kitts, Montserrat and Dominica. About 200 miles out of a total 600 of roads are paved. Newly installed electric generation capacity is about three (3) times the average load. And a 15,000 barrel per day oil refinery is operational, but presently closed due to the oil glut. Only in the area of potable water supplies does Antigua have any serious problems. Rainfall is periodic and intermittent with periods of drought. This need is being addressed by a bi-lateral AID project.

3. Antigua's exports originate mainly in the manufacturing sector, which is oriented to supplying other Caricom/ECCM countries. Manufacturing contributes about 10% to GDP. Little effort has been made to encourage enclave-type manufacturing industries for export promotion. The current account of the balance of payments (see Table below) runs about 20% in deficit. Food stuffs are the most important

exports, followed by consumer goods. Tourism is the most important foreign exchange earner. With declines in recent years due to world economic recession, Antigua's economy was depressed.

BALANCE OF TRADE
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Caricom-%</u>		<u>Major Trading Partners</u>			
		<u>Exp.</u>	<u>Imp.</u>	<u>EEC (UK)-%</u>		<u>US & Puerto Rico-%</u>	
				<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
111	30.6	88.4	14.2	0.5	34.1	1.7	35.5

4. In the Agricultural sector, much dependence was placed on a revival of the sugar industry, including using a possible preferential quota under the Lome Agreement. To date this effort has not been successful. Under estimation of the start-up costs and working capital, old low-yielding cane crops which had to be cleared off first, and Antigua's politically supported 'open' pasturage system are some of the reasons. In the area of food self-sufficiency, price control and poor market organisation has contributed to a general failure to produce enough food crops.

5. Antigua's government is committed to an ambitious program as the 'employer of last resort'. Wage increases of over 30%, and low productivity have contributed to expenditures exceeding revenues annually by 5 to 10%. A political decision to abolish income taxes and depend upon tourist taxes has also contributed to the deficit. At present, Antigua's foreign debt stands close to 50% of GDP. Almost 70% by World Bank estimate has been borrowed short-term at commercial rates.

6. Unemployment has been estimated by an ILO consultant at 20.7%. However, this was done by a sampling technique, and not a general census. The estimates of labour force participation - 56% - would make this the lowest in the region. More likely, the actual participation is close to the regional mean of 60 to 62%. That would mean that Antigua's working age population is overstated by about 10%.

7. Antigua's Gross Domestic Investment Rate was 51.8% in 1981. This rate is inordinately high compared to the other countries of the region. It may have reflected the substantial imports by the government in replacing diesel generating sets and spares to rehabilitate the oil refinery.

ST. KITTS/NEVIS

1. St. Kitts with a population of 34,000, and Nevis with 9,400 at the 1980 census, are combined in a federation which is the newest independent country in the Caribbean. It has a combined [>]GDP per capita of about \$1,015. The major infrastructure, a small airport for inter-island traffic on each island, and an established ferry service between them, has been sufficient for the islands' population, and to attract a small but affluent tourist trade.

2. The economy is based on sugar - a traditional crop. The Government owns most of the arable land, and is the employer of about one-third of the work force for that crop (which is seasonal) and sugar cane processing. The general economy has recently been in a small decline, due to the reduced production (25%) of sugar from 'smut-resistant' cane varieties and lower world sugar prices. St. Kitts has a 16,500 ton quota at preferential prices under the Lome Agreement in the EEC and another 16,000 tons in the US market (see Table below). Output, which has recently been about 36,000 tons, exceeds the quotas, including local usage. Excess is usually sold to Antigua or other Caribbean nations. The manufacturing sector has been encouraged by the Government to create more employment. It now employs about 18% of the labor force. Most of the enterprises are of the enclave type which depend upon efficient government processing and continued goodwill.

BALANCE OF TRADE
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Caricom-%</u>		<u>Major Trading Partners</u>			
		<u>EEC (UK)-%</u>	<u>US & Puerto Rico-%</u>	<u>EEC (UK)-%</u>	<u>US & Puerto Rico-%</u>	<u>EEC (UK)-%</u>	<u>US & Puerto Rico-%</u>
		<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
87	52.4	22.8	19.1	16.9	27.0	16.3	33.7

3. Among males, unemployment in 1980, at 10.4%, was lower than in all of the other countries, even with a much higher labor force participation rate (84.6%). Among females, unemployment at 15.3% was also lower than the other islands. Only Belize has a lower rate, but it has a much lower labor force participation rate among females than St. Kitts (50%). Also, among the critical groups in the 15 and 19 ages and 20 to 24 ages unemployment was lower.

4. Underemployment is not considered high compared to other island economies, as there is considerable 'feather-bedding' in the sugar industry. Cane cutters, for example, are kept on the payroll on an annual basis - although the crop season is 6 to 8 months. However, the underemployment factor is thereby high-lighted. On average, agricultural workers earn about 30% lower income than the national average, and Government workers earn about 30% higher. The lack of real growth in the population indicates that most of the younger entrants to the labor market prefer to migrate.

5. Gross Domestic Investment is estimated at 24.3%. External capital inflows supply the public sector with about half its requirements,

public sector savings supply the rest. The tourism and manufacturing sectors, thus far, have been developed by private capital investment.

BELIZE

1. With about 9400 sq. miles, and 145,000 people, Belize is the most sparsely populated country in Central America. The new capital is Belmopan, about 50 miles inland from the major urban center, Belize City. The population exhibits a natural growth of about 2.4% per year, but continuing migration, mostly to the United States, reduces the actual increase to about 1.3%.
2. The nation's economic infrastructure is still in the early stage of development. Substantial improvement in a road network and a new port have been initiated. Road maintenance remains a serious problem. Therefore, the economic routing for cargo to Mexico is by ship.
3. The economy turned sharply downward in 1981/82 due to poor agricultural output. The most significant factor was the decline in the sugar crop due to smut disease. Sugar is usually responsible for about 50% of exports. With the decline, the balance of payments have showed a current account deficit of about 12 to 15% of GDP.
4. As indicated in the table below, Belize exports mostly to the EEC/UK and US (sugar, bananas and citrus produce). Imports are to satisfy most of the domestic demand and practically all investment requirement. The 1981 estimate of Gross Domestic Investment was 27.7%.

BALANCE OF TRADE
AND MAJOR TRADING PARTNERS

<u>Imports</u> <u>(Mil. EC\$)</u>	<u>Exports/</u> <u>Imports-%</u>	<u>Major Trading Partners</u>					
		<u>Caricom-%</u>		<u>EEC (UK)-%</u>		<u>US & Puerto Rico-%</u>	
		<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>	<u>Exp.</u>	<u>Imp.</u>
287	75.0	3.2	1.9	50.6	25.5	43.8	38.9

5. Despite considerable land resources, of which less than 15% is currently being exploited, and a favorable climate for agriculture, Belize continues to import foodstuff - currently about 20 to 25% of imports, roughly some \$30 million/year. Major constraints to longer-term development of agriculture are shortages of agricultural labor, management, and agricultural technicians. There is also a shortage of working-capital and agricultural credit for farmers, and a negative marketing structure because of inadequate economic infrastructure and the existence of price controls.

6. Manufacturing growth has been affected by the saturation of the relatively small market and again by price controls on local goods. However, the private sector is an active one, and the investment climate is good with government eager to promote efficient import substitution activities, and export manufactured goods.

7. Regarding employment, Belize has the highest percentage of participation among males (98.4%) and the lowest percentage among females (30.3%) of all these countries. The employment level among males is also the highest (87.3%) with therefore the lowest level of male unemployment (11.3%). Among females, the employment level was the

lowest also (22.9%) and the unemployment the highest (24.5%). The unemployment among the 15 to 19 year age group averaged 40% with males at 33.4% and females 54.2%. The World Bank estimates that 67% of all the unemployment in Belize is in this age group, and that better than half is in Belize City.

8. Unemployment in Belize involves some complex factors. The country offers a great deal of opportunity to work in agriculture. However, this low status and low pay work meets neither the expectations nor the training of many of the younger group of unemployed, especially those who live in Belize City. As a result, the Government maintains an open immigration policy, and agricultural workers are imported from neighbouring countries where employment opportunities are even less available.

9. Future projections must deal with the fact that Belize has 49% of its current population under age 15 (the highest of any country in Middle America). Over the next ten years, these will need to be absorbed into the labor market.

Economic Summary

1. The small islands in the Windward and Leeward groups plus Belize which were included in the Basic Human Needs Project and are to be included in the Basic Needs Trust Fund Project are among the least developed of the newly independent Caribbean states. The Gross National Product per capita for these countries ranges from \$840 to US\$1500, if Montserrat is excluded.

2. The total population of about 660,000 at the 1980/81 census is too small a total market for the development of efficient manufacturing industry. Those that do exist are oriented towards import substitution for the local market where freight costs would be prohibitive (concrete blocks) or where a local preference can be supplied (soft drinks, beer, preserves). There are few processed exports, excepting rum, and items that are labor intensive enough to attract foreign-owned 'enclave' processing units (Maidenform, designer's jeans, etc.) This 'free zone' type of labor utilisation is actively being courted under the Caribbean Basin Initiative.

3. The economies of these small countries are very open to imports, partly because of the lack of consumer durable goods manufactured locally, but also due to the taste preferences of the tourist industry and some returning migrants. Food has become a significant import for many of these countries as well.

4. The traditional trading partner was the UK, and it is still the major market for many of the agricultural exports. But due to proximity and other factors, the US and Puerto Rico now equal or surpass the UK trade volume, especially with regard to imports.

5. Agriculture, which sector produces the exports, mostly tropical fruits, nuts and spices, has languished as a result of poor pricing policies and adverse terms of trade. As a result, it is not a preferred source of employment for school leavers in the 15 to 24 age group. This age group, important demographically as they make up between 50 and 60% of the populations in many of these countries, is generally suffering from severe un and under-employment. The rates approach 50% of the labor force among males between 15 and 19, and there is almost full participation among that age group. Females in that age group participate less, but show even higher rates of unemployment. Totally, the unemployment is about 17.7% and would approximate 40,000. This is based on census data taken in mid 1980 to late 1981, as yearly information is not available.

6. The countries show a high rate of gross domestic investment, but most of that is government and provided as grants or concessionary loans from outside donors.

PROJECTED ECONOMIC OUTPUTS

1. The quantification of anticipated economic outputs of BNTF can only be done very haltingly. For one, the sub-projects are almost entirely social and not economic in nature. For another, even for labor impact the type and magnitude of the outputs can vary greatly depending on: mode of construction (force account vs contract); government priority (building vs reforestation); design specifications; the modus operandi of the construction agency (i.e. their habitual equipment - manpower mix); the policy of the particular government to transfer in-house staff to the project vs hiring new people; the extent to which the people hired were previously un or under-employed; the value of any OJT that may occur and the extent of indirect economic outputs that may be generated (e.g. making furniture for the new schools).

2. Nevertheless, the evaluation study of BHN which was carried out in November 1983 may serve as an estimation basis at least for probable labor impact of BNTF.

3. There are definitely economic outputs that can be attributed to social projects, but they are not quantifiable in the sense that wages and value added contribute to the Gross Domestic Product. The investment made in the public sector, in contrast to the annual operating costs, is separately calculated. This, plus the domestic investment made by private enterprise becomes the Gross Domestic Investment, and it can be expressed as a percentage of the Gross

Domestic Product at market prices. But there is not a market price for primary education, for example, where the government provides it free of charge. It is not a tradable commodity. There is not a market price for clinic health service, especially preventive-type and family planning services, where the government provides it as a matter of policy. Again, it is not a tradable commodity. Furthermore, the public infrastructure built under BHN, and to be built under BNTF is mostly upgrading and replacement for existing facilities. They have probably outlived their economic life - such as small wooden structures have - and are being phased-out and replaced with concrete block buildings. This tendency existed before the hurricanes did their damage in several of these islands, but the pace has increased as a result of the necessity to rebuild and replace damaged structures. Therefore, it is not possible to specify concrete 'economic outputs' for such activities.

4. The construction of these public buildings does, however, add to the capital wealth of country. The amount of this addition is directly proportional to their economic utility. Therefore, it is important that these facilities be constructed according to some well-conceived over-all plan for the development of the country. A facility constructed in an area of declining population may outlive its usefulness prior to the expiration of its economic life. Poorly constructed facilities on the other hand are outmoded and too expensive to maintain before the need for them is over.

Labor Wages

1. As stated in the original Project Paper for BHN, there was a basic objective established to achieve a 40% rate of direct labor employment. The project overall achieved a 35% direct labor cost ratio in the six (6) countries that were evaluated. The individual achievement of direct labor employment as a percentage of total cost are presented by sub-project category in Table 7 . It shows that:
 - a) sub-projects involving the construction of building structures appeared to involve a more-or-less standard labor cost to materials and overhead relationship throughout the islands.
 - b) Other types of sub-projects, such as roads, water systems and drainage varied considerably in their labor utilization, primarily dependent upon the emphasis placed by government on labor-intensive methodologies and techniques.
 - c) agriculturally oriented sub-projects, such as reforestation and land conservation were project types in which the labor intensity was the greatest. They also were carried out by a sector of the labor force that is most likely to suffer from underemployment.

2. The wages that the laborers receive for their work must be included as an economic output of these projects. Although all these island economies are very open to importation, including the importation of food stuffs, the wages might be considered at full value if these workers would otherwise be all or partly unemployed. Where the wages are simply paid to existing workers, and the effect is to bid them away from another job, then there is no net effect to the economy. A comparison of the average wages paid per man-week for different type of work on a man-week basis quickly indicates that certain types of BHN sub-projects were staffed by the lowest skilled, and the

TABLE 7

Direct Labor Cost as a Percentage of
Total Cost by Sub-project Category and by Country: BHN

Six Countries Evaluated

Sub-Project Categories	DOMINICA	ST. LUCIA	ST. VINCENT	ANTIGUA	MONTSERAT	ST. KITTS/NEVIS	Average by sub-project category
Buildings	28	35	35	39	46	30	33
Roads	*	36	64	*	20	*	58
Reafforestation	*	*	88	*	58	*	75
Soil Conservation	*	*	82	*	*	53	58
Drainage	*	45	*	21	*	*	29
Water Systems	38	25	*	*	18	33	30
Average labor percentage in six countries evaluated	28	34	47	34	38	36	*

Information presented in Table 15 of the Evaluation Report

Average values were calculated independently based on costs and not by averaging the cell values in the column or row.

lowest paid workers in the economy. The following examples are cited:

EC\$ 5.76 per week for agricultural feeder road construction in Montserrat

\$33.67 per week in St. Kitts

\$47.06 per week in St. Lucia for soil conservation projects

\$64.90 per week in Montserrat for re-afforestation projects

\$49.30 to \$66.67 per week in St. Vincent for building projects

\$65.33 per week in Montserrat for redevelopment of spring water sources

These workers were certainly at the bottom of the wage bracket. In comparison, the average wage costs on some other types of BHN sub-project (i.e. buildings) were:

EC\$229 per week - St. Lucia - water projects

\$172 per week - St. Lucia - school construction

\$160 per week - St. Kitts - school construction

\$148 per week - Antigua - school project

\$133 per week - Dominica - health clinics construction

3. It might be argued that these latter projects were not great beneficiaries to the unemployed. However, in that all these countries exhibit high rates of unemployment, and in that the new economic activity created by the project was an outside intervention, any skilled workers who were employed, therefore may have opened up places at the bottom rungs for unskilled workers. In this case the marginal economic benefit to the economy is that amount of wages that the new entrant to employment receives, i.e. number of man-weeks x the minimum wage level in the country.

Indirect Labor Outputs

1. In addition to the employment created directly by a (building) sub-project, additional indirect employment is created in these economies to: supply the materials, transport them to the project site, hire caretakers, etc. For example, the BHN schools were built to a specification ranging by country from 20 to 35 students per classroom. The desks, certain wood structural components like shutters, the concrete blocks, the sand and gravel used in the cement, all created economic activity in the effecting country which should be credited to the project.
2. Measurement of indirect labor content is very difficult, however, unless a bill of materials is supplied, and the individual items are themselves priced out in terms of labor content and materials. If any of the materials are of local origin, then there may again be additional economic activity to credit to the project. On average, about 15 to 25% of the cost of these purchased materials represent wages. If the materials used in construction of a school, for example, represent approximately the same percentage of cost as the direct labor, i.e.: 35%, and if 17 to 25% of these materials are of local origin, the following indirect labor would be generated as a result of this school project:

	<u>BHN Range</u>		
	<u>Low</u>	<u>Mid</u>	<u>High</u>
% materials X % local X % labor	=	35 x .17 x .15	.35 x .25 x .25
additional labor as a percentage of total cost		0.89%	2.2%

3. For schools, and probably health clinics too, there would therefore be an additional 1 to 2% of indirect labor content which can be credited to the respective activities. These have been added into the estimated labor content percentages achievable in BNTF shown in Table 48.

4. Assuming:
 - 1) that the BNTF project costs will be distributed similarly to those of BHN (schools 52%, health and other public buildings 13%, water 15%, roads and drainage 13%, land-related 79%);
 - 2) a BNTF total funding of 13.5 million; and
 - 3) direct and indirect labor content as estimated above, the total labor impact of BNTF will be in the magnitude of US\$5 million. Allowing a 20% increase in the BHN average weekly wage (to bring it to \$39.95) would imply the creation of 128,370 man-weeks of employment in BNTF.

5. More detailed projections of labor impact, by country and by type of sub-project based on the BHN experience are included in the Appendix.

TABLE 8

Direct and Indirect Labor Content
by Type of Sub-Project

<u>Sub-Project Type</u>	<u>Percentage of Direct Labor under BHN</u>		<u>Total Labor</u>
	Range	Average	<u>(Direct and Indirect)</u> <u>Projected for BNTF</u>
Buildings:			
Schools	24 to 48%	(27) 33%	35%
Health Clinics	21 to 35%	(8) 27%	29%
Other public	34 to 47%	(4) 44%	45%
Water Systems	18 to 38%	(17) 30%	32%
Roads	36 to 64%	(5) 58%	58%
Drainage Systems	21 to 45%	(5) 29%	31%
Re-afforestation	58 to 88%	(2) 75%	75%
Land Clearing		(2) 53%	53%
Soil Conservation	53 to 82%	(2) 62%	62%

COST BENEFIT ANALYSIS

1. The economic outputs of different categories of sub-projects have been discussed. The problem of specific identification of the beneficiaries, and a quantification of those benefits is a more difficult problem. In general, the sub-projects (BHN and BNTF) are extremely deficient in information which would be required for economic benefit analysis and justification.
2. By definition, the Basic Human Needs project and the BNTF follow-on are intended to address development requirements which might not otherwise be funded. These sub-projects would not qualify for funding through loans, or other sources because they have low calculate^{V.L.} project efficiencies or pay off. That is, the ratio of benefits to costs is not high enough to constitute an acceptable 'bankers risk'
3. The sub-projects can be separated into three categories. Those that deal solely with social infrastructure, and produce no 'productive' economic outputs, can be analysed on a cost-effectiveness basis. That requires that the data on the identification and quantification of the project beneficiaries be ample, but the magnitude of their benefits need not be known. Examples are the number of pupils who will attend a new school, or the population that will be served by a health clinic. This is essentially the 'cost per user' criterion in our sub-project identification system.

4. The second general classification of sub-projects would be those which produce some service for which a charge might be levied. Water and electricity service come into this classification. Presumably, even if the rate of return over time is very low, the 'service' project could justify itself (at least in theory) in terms of return of capital invested. Here the Cost-benefit ratio would be an appropriate criterion.

5. The third general category of sub-projects would include public works such as roads, drainage, re-afforestation, land clearing and soil conservation. These activities, if done for a large scale project, would normally warrant a cost-benefit analysis. The data on the eventual financial returns would have to be estimated from field survey or other statistical information. An example is the complete analysis done by the Caribbean Development Bank on the development of an agricultural feeder road system for both Dominica and Grenada. These projects were implemented on a loan basis, and even though the loans were at concessionary interest rates, the CDB and governments wanted to assure that the project would result in sufficient additional national income to these countries to repay the loans and interest. Both project papers completely analysed the agricultural potential of each island's economy, and made predictions on the additional output that would be achieved directly as a result of the project, including both the additional incremental cost to produce the output, and the effect it would have on agricultural production and markets. These

projects (EC\$4.5 and 5.9 million, respectively) by their size and by the fact that the governments are committing a portion of their own funds with an obligation to repay both principal and interest, justify the efforts of a full cost-benefit analysis. The types of projects considered in BHN and BNTF were and are not of the same magnitude of investment. They could not warrant the same expenditure of time and energy in their justification methodology.

Employment Projects: Method and Example

1. Since BNTF (like BHN) is intended to be an employment creation project, the most fundamental cost benefit question to pose is: how much will it cost to create each man-week of employment? A corollary question is: how much should it cost to create a man-week of employment?

2. A recognized method of determining the economic benefit for employment creation is the application of a World Bank formula. The formula combines measures of: the general economic activity, the propensity of the economy to invest, and the percentage of the target population, and indicates an 'acceptable level' of capital investment for a job of one year's duration. This figure can be multiplied by the estimated number of years the job will exist and the number of jobs created. In this case we divided the factor to determine the 'acceptable level' of investment for a man-week (assuming a 52 man-week year). The formula may be expressed thusly:

Acceptable cost for one (1) man-year of employment =

$$\frac{\text{Gross National Product}}{\text{National Population}} \times \frac{\text{Gross Domestic Investment}}{\text{Gross National Product}} \times \frac{1}{\frac{\text{Target Population}}{\text{National Population}}}$$

Cancelling out the common factors, the equation reduces to:

Acceptable Cost = Gross Domestic Investment ÷ target population, where

- a. Gross National Product is at Market prices,
 - b. The Gross Domestic Investment is the sum of both Government Investment and Private Investment for the year, and is estimated by the World Bank/IMF economists from national income data. It is expressed as a rate: GDI/GDP.
 - c. The target population is assumed to be the employed. The tables in the Appendix show calculations:
 - firstly, the unemployment as a percentage of total population not just as a percentage of the working force must be calculated;
 - secondly, the individual factors for each country must be calculated, and adjusted for known changes in either the Gross Domestic Investment levels, or the target population. For example, if employment objectives were targeted only towards either males, or females, the respective rates for either sex should be used. The same could be applied to employment creation programs that were directed towards the youth sector, either in the 15 to 19 age or the 20 to 24 age groups, or to both. From the census data, these populations can be approximated, and updated for population growth.
 - d. National population is straight forward.
3. The World Bank factor as used is a measurement of the allowable investment which is justifiable on employment objectives. It requires that the incremental investment used to create additional employment in a country not exceed the general investment levels of the economy in proportion to the target population. In BHN and BNTF the target population is the unemployed as potential beneficiaries. The acceptable costs are shown in the last column of Table 9.

TABLE 9

CALCULATION OF INVESTMENT PER JOB

(World Bank Method)

	Population (000)	GDP/capita EC\$	Gross Domestic Investment Rate	Participation Rate	GDP/capita x IR/PR	Acceptable Cost per Man-week of Employment created EC\$
COUNTRIES:						
<u>Windward Islands:</u>						
Dominica	76	2424	28.4%	6.4%	10,756	206.86
Grenada	91	3199	37.9%	6.5%	18,653	358.70
St. Lucia	115	2914	42.3%	6.4%	19,260	370.38
St. Vincent	97	1762	25.7%	6.4%*	7,076	136.07
<u>Leeward Islands:</u>						
Antigua	77	4568	51.8%**	7.8%	30,336	583.39
Montserrat	12	6652	38.7%	4.4%	58,507	1,125.14
St. Kitts/Nevis	44	3537	24.3%	4.7%	18,287	351.67
Belize	145	2921	31.9%	4.4%	21,177	407.25

* Data for St. Vincent not available; assumption average unemployment

** Data for Antigua appears inflated; adjusted GDI to level of Dominica/
St. Vincent/St. Kitts average = 26.5% x 1/.078 = 15519 or \$298.45/week

4. Unlike straight 'Percent Labor Content', the factor takes into account:

- the greater investment required in countries with a higher Gross Domestic Product per capita
- the rate of GDP being put into domestic investment
- the unemployment rate

It rewards those countries with a higher Gross Domestic Investment.

As the unemployment increases as a percentage of population, the amount required to create additional jobs decreases on the assumption that labor would be willing to work to lower rates. In the BNTF application, using predicted labor content (on the basis of BHN experience) as a percentage of estimated total sub-project cost, and the average wage rate experience by category of sub-project, ---- the lower wage levels produce the higher credit in terms of man-weeks of projected employment. Then, applying the factor, the amount of 'credit' for employment objectives alone is produced. This is greater for the lower wage-levels than the higher wage levels. The use of only the percentage labor content does not take this into account.

With the application of the formula, the sub-projects eligible for BNTF, if economic justification were necessary, could be reduced in terms of the investment levels that needed to be justified. At that point, standard cost-benefit ratios and financial analysis can be applied for decision-making.

5. A comparison of the average investment cost per man-week under BHN as shown in Table 10 shows that three countries generally exceeded those levels which could be justified under employment objectives alone, and three were reasonably within them. The ratio of the actual cost against the World Bank factor is the most convenient measurement. Dominica, with a ratio of 2.1 to 1 is the highest followed by St. Lucia (1:4 to 1) and Antigua on an adjusted basis of 1:3 to 1.

6. The investment per man-week by category of sub-projects indicates that the greatest problems occur in the construction of schools and clinics, plus some water systems. The investment per man-week in these categories of sub-projects can not be justified on the basis of the employment objective alone. The remainder of the categories of sub-projects vary considerably, dependent upon the general design of the sub-project and its emphasis on employment generation.

7. However, in the table 11 a methodology is proposed which could permit such capital intensive infrastructure sub-projects to be justified at least in part on the employment objective, and the remainder of the investment (the excess over the permitted investment per man-week of employment created) could be justified on other grounds. In this table, the World Bank factor is multiplied by the number of man-weeks from BHN experience to give an amount of investment that could be justified solely on the basis of employment. This amount subtracted from the actual total cost^{1/} leaves a remainder to be justified under other grounds. The ratio of this remainder to the

^{1/} in BHN

Table 10 : Comparison of World Bank Investment Factor with Actual BHN experience on man-week basis
(all dollar figures in EC \$ per man-week)

	World Bank Investment Factor	Average Investment	Ratio: Average to WB Factor	Actual rates achieved under BHN-1 sub-projects by category								
				Buildings/schools	Buildings/clinics	Buildings/other	Water systems	Roads	Drainage	re-afforestation	land clearing	soil conservation
Dominica	207	434	2.1 to 1	526	500	284	281	n.e.	n.e.	n.e.	n.e.	n.e.
St. Lucia	370	525	1.4 to 1	493	492	n.e.	914	413	322	n.e.	n.e.	n.e.
St. Vincent	136	109	0.8 to 1	150	147	198	n.e.	75	n.e.	58	n.e.	57
Antigua	298 *	375	1.3 to 1	398	607	268	n.e.	n.e.	440	n.e.	n.e.	n.e.
Monserrat	1125	290	0.3 to 1	575	339	n.e.	372	29	n.e.	117	n.e.	n.e.
St. Kitts/Nevis	352	203	0.6 to 1	534	n.e.	n.e.	417	n.e.	n.e.	n.e.	107	63
average				320	367	255	438	83	403	74	107	61

n.e. = no experience

* adjusted rate

Table 11 : Comparison of Employment justified Investment under BHN

	<u>Allowable</u> <u>cost/manweek</u> <u>(1/3 factor)</u>	<u>total</u> <u>manweeks</u> <u>(actual)</u>	<u>Justifiable</u> <u>under employment</u> <u>objective (000)</u>	<u>Total</u> <u>Investment</u> <u>(Actual)</u> <u>—(000)—</u>	<u>Remainder</u> <u>Justified</u> <u>other</u> <u>objectives</u> <u>(000)</u>	<u>Ratio</u> <u>Employment/</u> <u>Other objec</u> <u>(000)</u>
(all dollar figures in EC \$)						
Dominica:						
schools	\$206.86	7991	\$1,653	4,207	2,554	1:1.6
clinics	"	1294	\$ 268	647	379	1:1.4
water systems	"	3573	\$ 739	1,003	264	1:0.36
St. Lucia:						
schools	\$370.38	4857	\$1,799	2,392	593	1:0.3
clinics	"	701	260	345	86	1:0.3
water systems	"	1438	532	1,314	782	1:1.5
Antigua:						
schools	\$298.45	4628	1,379.	1,841	462	1:0.34
clinics	"	800	238	485	247	1:1.0
water systems	"	n.e.				
St. Kitts/Nevis						
hools	\$351.67	9174	3,226	1,588	0	1:0
clinics	"	n.e				
water systems	"	2623	9 922	1,093	170	1:0.2

investment justified by the employment objective would ideally be 1 to 0. This is the case as shown for the investment under BHN schools in St. Kitts/Nevis only.

8. Water Project: Method and Example

Water sub-projects would normally be justified on the basis of their return from user rates. The following Tables 12 and 13; therefore, illustrate a typical cost benefit analysis done on utility projects. These six water delivery system projects were submitted by the Water Department in St. Vincent. In the first instance, the water department is running seriously in deficit on their current budget. The only conclusions that can be made are either: 1) the department is vastly overstaffed as the general and administrative overhead is 1:5 to 1:7 times the revenue received depending upon which year's budget is used; or 2) the rates being charged users are heavily subsidized. A correction of either or both of these conditions would call for a change in government policy in St. Vincent. But, it must be assumed that the water sub-projects being proposed must be justified on the basis of present user rates and water department staffing policies. From 1 to over 50 years would be required for payback for the various activities. A second economic analysis was made^{1/} as an example of what might be done to adjust these paybacks. In this analysis, the amount of the cost that could be justified by the employment function was calculated and then used to reduce the amount of investment 'paid back'.

1/ See Table 2³

Traditional Cost Benefit Analysis

ST. VINCENT SUB-PROJECT: Water Distribution Systems: Estimated Cost = EC\$1.085 Million

Component Sections:

Location	Investment EC\$	Population served	Investment Cost per user	Estimated Maximum demand/day & per year	Investment Cost per Gallon over one year mils/gallon	Estimated Revenue 1982/3	Revenue after mtc cost	Un-discounted no. of years for payout	No. of years if payments discounted 12%
Marron	134,000	3000	\$44.64	90,000 32.8 mil.	\$4.1	\$ 33,390	\$25,042	5.4	9.
Galaway	100,000	4500 + Industrial estates *	\$16.66	180,000 65.7 mil.	\$1.5	\$ 66,780	\$55,065	2.0	2.5
John Hall	273,000	5400	\$50.55	162,000 59.1 mil.	\$4.6	\$ 60,102	\$45,076	6.1	12.
Majorca	58,000	9000	\$6.44	270,000 98.5 mil.	\$0.6	\$100,170	\$75,127	0.8	1.
Sandy Bay etc.	250,000	5600	\$44.64	168,000 61.3 mil.	\$4.1	\$ 62,328	\$46,746	5.3	9.
Grenadines	270,000	3000	\$90.00	90,000	\$8.2	\$ 33,390	\$25,043	10.8	over 50

* Industrial estates assumed to = 25% of system

Data and Assumptions used in the above analysis:

1. St. Vincent's Water Department Revenue projections of \$1.1 million for 1982 and \$1.365 million for 1983.
2. Water Department's budgeted maintenance estimates, excluding general and administrative costs, as a percentage of revenue were 14.3% (1982) and 27.9% (1983). (Assumption was made that 75% of revenue on average was remaining after direct maintenance costs was deducted.)
3. Water rates of EC\$6 per month for one outlet, and \$10 per month, on the basis of an estimated 18 gallons per day from 1 outlet, and 30 gallons per day for more than one provided by CDB, indicates a mileage rate of approximately 1.0 to 1.1.
4. Population at 1980 census of 96,724; increasing by 1.5% per year.
5. Based on population, and assumption of 100% water delivery service, contribution per capita was \$11.13 pp in 1982 and is projected at \$13.50 pp.
6. Choice of a 12% discount rate represents commercial not concessionary loan rates.

TABLE 13

Employment Inclusive Cost Benefit Analysis
 ST. VINCENT: Six Water Distribution Systems (EC\$1.085 Million)

Location	Investment EC\$	Estimated Labor-EC\$	Estimated Man-weeks (@ EC\$367)	Justified: Employment Function EC\$	Remaining Investment SEC.	Population served	Remainder Investment per user	Revenue after m/c cost	Un-Discounted no of years for payout	No of year if payment discounted
Hamon	134,000	42,880	640	87,085	46,915	3000	15.64	\$25,042	1.9	2.3
Dalway	100,000	32,000	478	65,041	34,959	4500 + Industrial estates *	5.83	\$55,065	0.6	0.8
John Hall	273,000	87,360	1304	177,435	95,565	5400	17.70	\$45,076	2.1	2.9
Majumca	53,000	18,560	277	37,691	20,309	9000	2.26	\$15,177	0.3	0.4
Sandy Bay etc.	250,000	80,000	1194	162,468	87,532	5600	15.63	\$46,746	1.9	2.2
Grenadines	270,000	86,400	1290	175,530	94,470	3000	31.49	\$25,043	3.8	5.2

Data and Assumptions used in the above analysis:

1. The estimated labor percentage was based on BHN-1 experience, adjusted to 32%
2. the average man-week wage rate for St. Vincent was adjusted because no experience on water projects in BHN-1.
3. the WB investment per man week was used at the multiplier for justification of the employment function only

* Industrial estates assumed to = 25% of system

9. The results, as shown in Table 12¹² significantly improve the economic return of most, but not all of the sub-projects submitted. Using a 12% social discount rate, reflective of current commercial, not concessionary, interest rates for borrowings, the following results occur:

- the water system investment payback for 3000 users at Mamon is reduced from 9 years to 2.3 years
- the water system investment payback for 5400 users at John Hall is reduced from 12 years to 2.9 years
- the water system investment payback for 5600 users at Sandy Bay, etc. is reduced from 9 years to 2.2 years

However, if an investment payback in 4 years or less were to be considered a cut-off point, the investment for the water system for the Grenadines would not qualify.

Other Productive Infrastructure Projects

1. In the category of productive infrastructure, the methodology for cost-benefit analysis involves specifying in detail, the costs and economic outputs from each sub-project.

2.

identification and qualification:

a) Water Systems and Electrical Systems:

The additional users to benefit and the estimated quantity per user who will benefit from the service provided, plus the additional costs of maintaining the new facility and any additional marginal operating costs. The rate that the users pay for this service will be used to recover the investment and operating costs.

b) Re-afforestation:

The rationale for the sub-project should include the provision of hardwoods for furniture, carpentry or charcoal production etc.

(Charcoal is commonly used as a cooking fuel in the islands). This involves knowing the types of trees to be planted, the expected output in terms of growth rate and harvest potential, the costs to plant, tend, cut and deliver it to a market, and an estimate of the market price. (This information was not available on the St. Vincent re-afforestation project under BHN). Also, some reafforestation projects are carried out for another primary purpose, namely soil conservation.

c. Soil Conservation/Coastal Protection/River Re-alignment:

The benefit in terms of what values would be lost without the sub-project. Possibilities are: the loss of a beach as a tourist attraction where there are already hotels and other facilities in existence; the replacement cost or re-alignment cost of a coastal road that would be lost if the shoreline were not reinforced against erosion; the loss of productive farm land in terms of its annual net income (revenue after expenses to produce the agricultural produce) alongside a river bank.

d. Drainage Systems:

The annual loss in output or cost to repair damage from excessive flooding in urban areas; the value of land recovered from the draining of swamps; the cost of damage repair to the roads if drainage culverts are not maintained and replaced.

e. Roads (primarily agricultural type):

The value of the additional produce that will be available for sale from the production of the lands opened up after deduction of the additional costs to produce. The maintenance costs of the additional roads must also be taken as a deduction from the benefits.

f. Public Buildings (post offices, etc.):

The revenue that will be taken in by the country because of the existence of the new or improved facility less the additional operating and maintenance costs should be calculated. Because of the nature of the physical infrastructure produced, payback periods tend to be lengthy. Inclusion of rent paying office space in the project often can make it more economic in term of the rate of return.

SUB-PROJECT IDENTIFICATION

This section of the report presents our recommendations on a systematic method of selecting and ranking the project activities proposed by the various host governments as to their developmental utility and eligibility for funding.

Selection Criteria

1. The criteria used in the predecessor BHN project and those given in the PID were our reference points. These are given below. The PID explicitly mentions that they are subject to revision for the upcoming BNTF.

<u>Criteria</u>	<u>BHN</u>	<u>PID</u>
1. Local labor content of sub-project	X	X
2. Government priority	X	X
3. Socio-economic need	X	X
4. Environmental effect	X	X
5. Recurrent maintenance costs	X	X
6. Maintenance saving capacity	X	
7. Availability of technical input	X	X
8. Timing on implementation	X	X
9. Management competence	X	X
10. Availability of alternative funding		X
11. Intended beneficiaries		X

2. The criteria list and approach we recommend seeks to:
 - a. be reality-based
 - b. allow the host governments to exercise their priorities; and

- c. reflect costs and benefits
- d. avoid rating and ranking errors (such as 'halo effect')

Utility Assessment

3. We developed our criteria system in the following way. A meeting was held (January 20, 1984) to get consensual agreement among USAID, CDB, and G7 on an initial criterion list. This produced criteria Nos. 2 through 11 in Table 14. A second step was to decide on the relative weights to be assigned the agreed on criteria. These are also indicated in Table 14. The third step was to apply a technique known as Multiple Criteria Utility Assessment still in the group setting. This is simply a systematic method for assessing the worth of complex alternatives (i.e. the proposed sub-projects). Considering one criterion at a time, we arrived at the consensual utility, or worth, or value corresponding to the various levels of that criterion. The utility functions thus generated are given in this section.

4. Following our field trips (January 23 to February 16) to seven countries in our scope of work (i.e. excluding Anguilla and Montserrat) the G7 team analysed our documentary and interview data. The field experience led us to elaborate and refine the initial criteria list to that presented in Table 14.

TABLE 14

Within-Country Selection Criteria for
Sub-Project Identification

First Screen: Go/No-Go Factors

	<u>No</u>	<u>Yes</u>
1. Consonance with AID policies	Ineligible	Eligible
2. High probability of alternative funding	Eligible	Ineligible
3. Primary benefits to lower income groups	Ineligible	Eligible

Second Screen: Variable Utility Factors

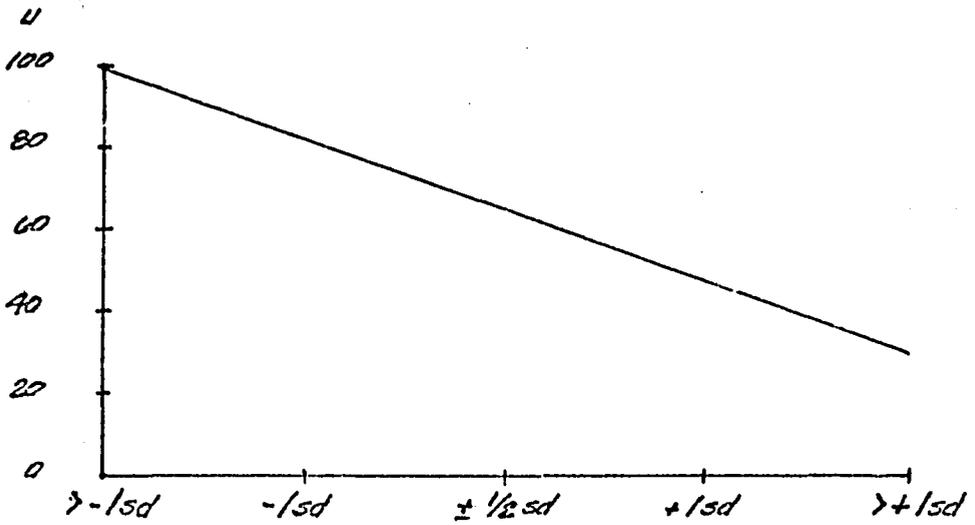
	<u>Weight</u>			
4. Cost	0.5	(See Utility Chart)		
5. Anticipated labor content	1.0	"	"	"
6. Anticipated start-up time	0.9	"	"	"
7. Materials (% imports)	0.8	"	"	"
8. Recurrent maintenance costs	1.0	"	"	"
9. Anticipated environmental effect	0.4	"	"	"
10. In-house technical expertize	0.5	"	"	"
# 11. In-house management expertize	0.9	"	"	"
12. Spread (BIN expenditures & population distribution)	0.4	"	"	"
13. Cost per beneficiary/user (within 0.8 categories)	0.8	"	"	"

Third Screen: Political Factors

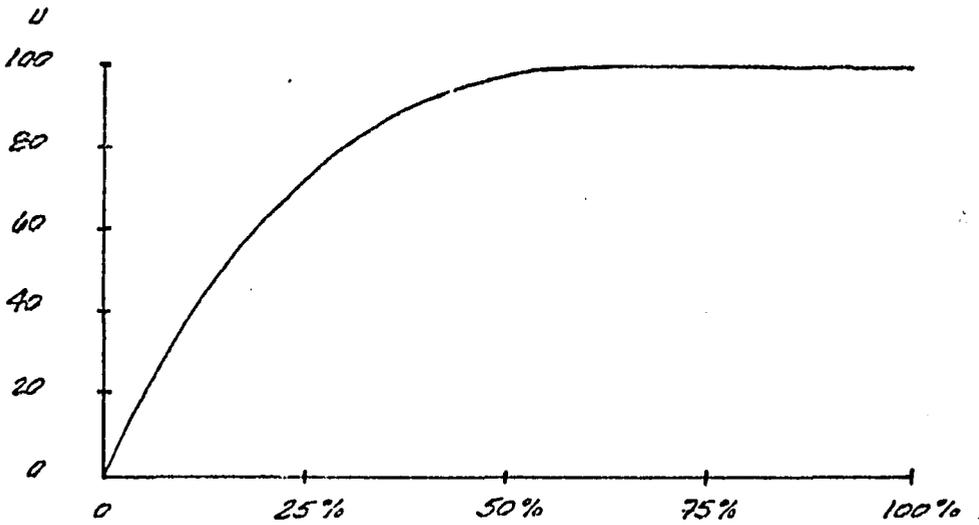
14. Government priority

Subsequently dropped from the system.

UTILITY FUNCTIONS

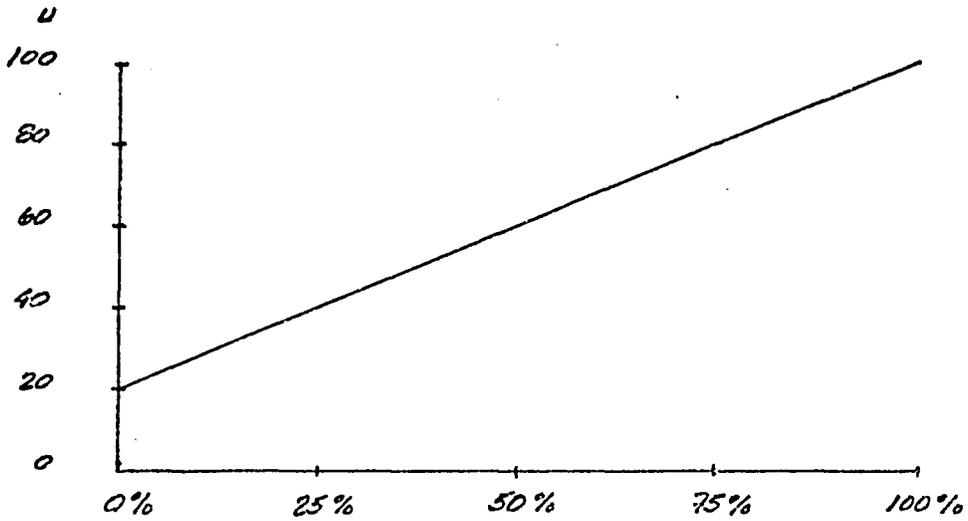


Costs - 0.5

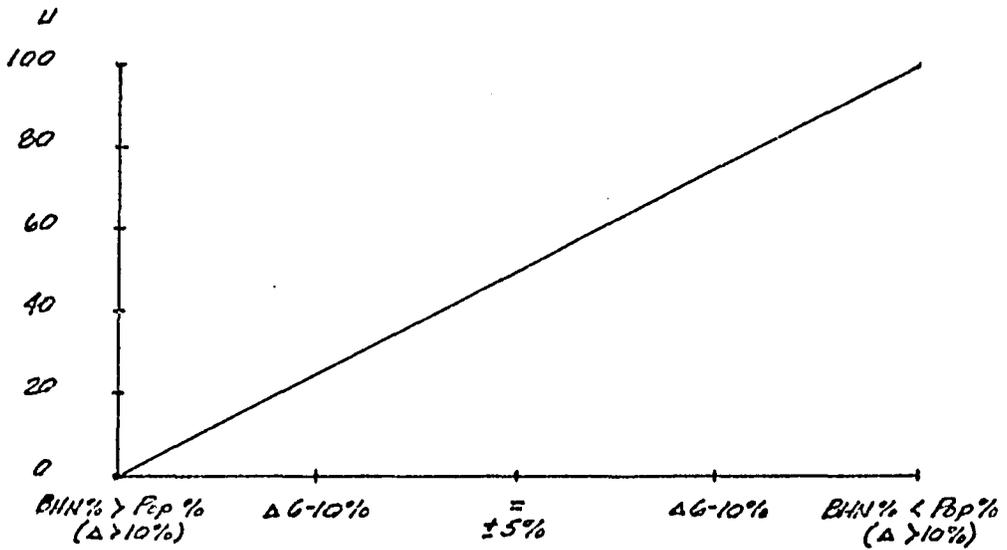


Anticipated Labor Content - 1.0

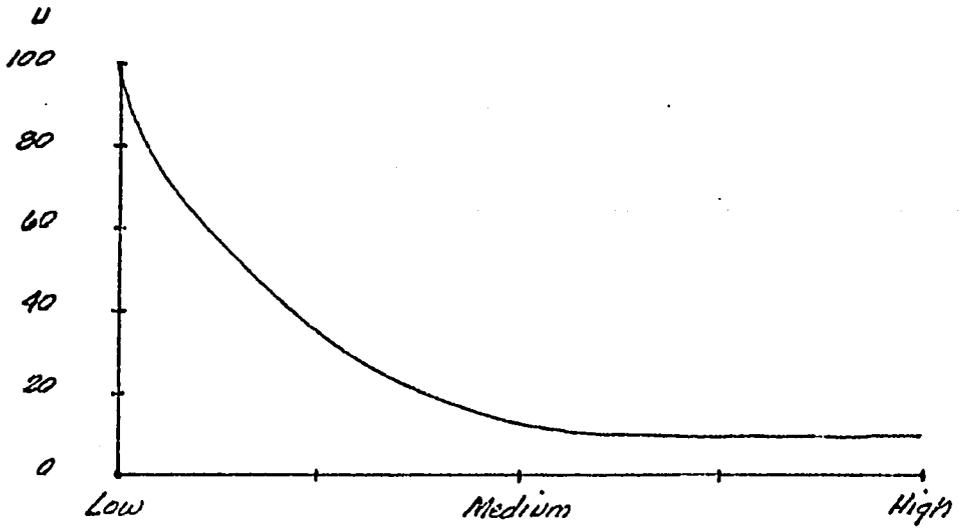
u = utility



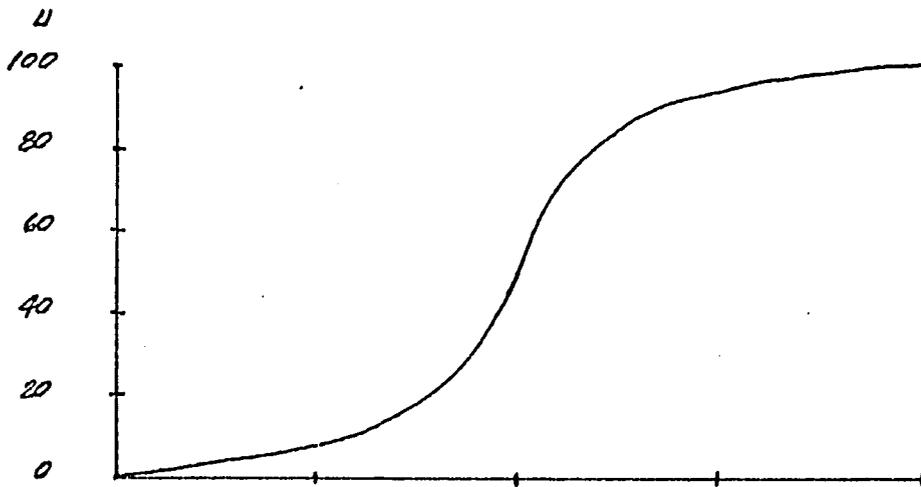
In-house Technical Expertize - 0.5



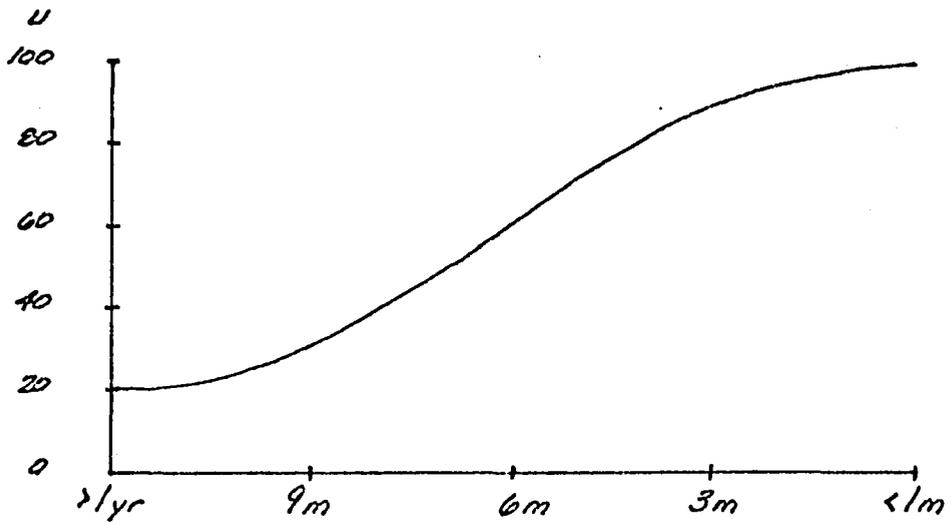
Spread (BHN expenditures & population distribution) 0.4



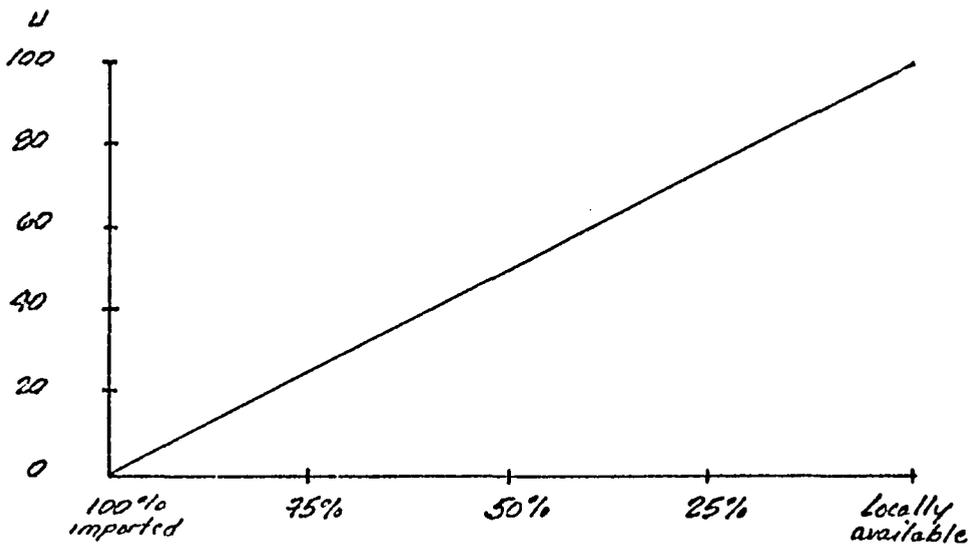
Recurrent Maintenance Costs - 1.0



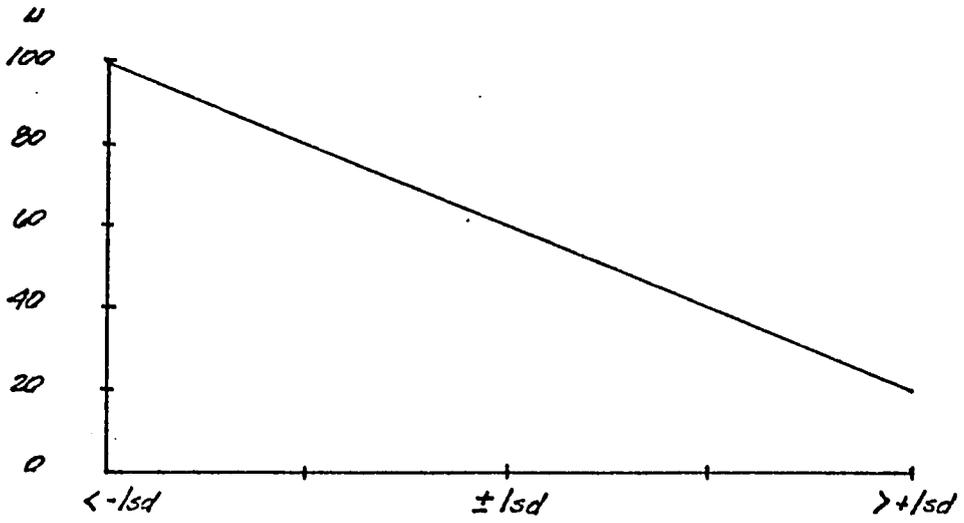
Anticipated Environmental Effect - 0.4



Anticipated Start-up Time - 0.9



Materials (% imports) - 0.8



Cost per Beneficiary/User (within categories) 0.8

Criterion 1 (consonance with AID policies) was added explicitly to recognise an implicit reality. Criterion 12 (Spread or Equity) was added (with a weight of 0.4) to allow us to consider the location of BHN sub-projects (vis a vis population) within a country and assume that BNTF proposed activities would not go disproportionately to particular districts or parishes. Criterion 13 was added (with a weight of 0.8) to reflect the relative worth of e.g:
Water Sub-project A costing X \$ per user vs.
Water Sub-project B costing X + Y \$ per user

5. Next, we calculated the aggregated utilities for each proposed sub-project in a country which values then constitute a rank order of eligibility. These are listed in the next section of this report. ^{1/}
6. Then, assuming that the short-list of eligible sub-projects exceeds country allocations, the respective governments can exercise their priorities (i.e. apply Criterion 14). The advantage of this changed approach from BHN is that it avoids the possibility of confrontation at the start of implementation between CDB and the various governments because it allows the governments to exercise their priorities without offending national pride.

^{1/} The lowest Total Utility Score attainable is 69; the highest 630. There is a large random error component in these scores, therefore small numerical differences between two sub-projects should not be over-emphasized.

7. After due consideration, Criterion no. 11 was dropped from our system finally because it is the management expertise of the Project Supervisor and the sub-project foremen that is critical, not that of the in-house ministerial staff. The identity and qualifications of the former are as yet unknown.

8. Factor No. 12, Spread, deserves some comment. It is an attempt to get at a measure of social equity in the disbursements of BHN & BNTF funds. For each country, we plotted percent population by district against percent BHN expenditures in that district. These figures are presented in the pages following. Notice, for Dominica e.g. that the two distributions are quite similar. Nevertheless, the Parish of St. Andrew (No. 9) got more than twice as much of the BHN funds as they have population (36 vs 17%). On the other hand, St. George got less than their fair share (11 vs 28%). Thus, in our utility assessments, we reasoned that other things being equal, funding more activities in St. Andrew is less desirable than funding some sub-projects in St. George. Therefore, proposed BNTF activities in St. Andrews would receive a low utility score on this criterion, the ones in St. George, a high one. Although this factor is thus already reflected in the Total Utility Score for each proposed sub-project we would suggest that in the final approval of sub-projects, none be included which are located in districts (like St. Andrew Parish in Dominica) in which the BHN funds spent exceed the population by more than 10%.^{1/}

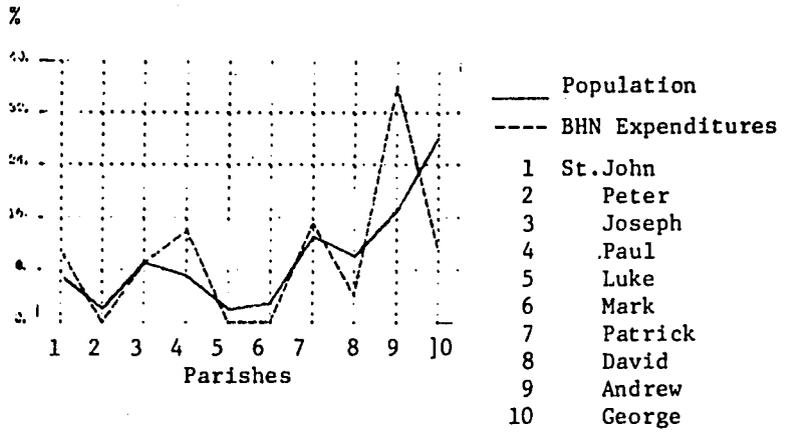
^{1/} Unless such a district is demonstrably the poorest socio-economically or the hardest hit in recent hurricanes.

Conversely, the activities in BHN unfavored districts (like St. George Parish in Dominica) might receive preference even though the Total Utility score may be slightly lower than that of a competing sub-project.

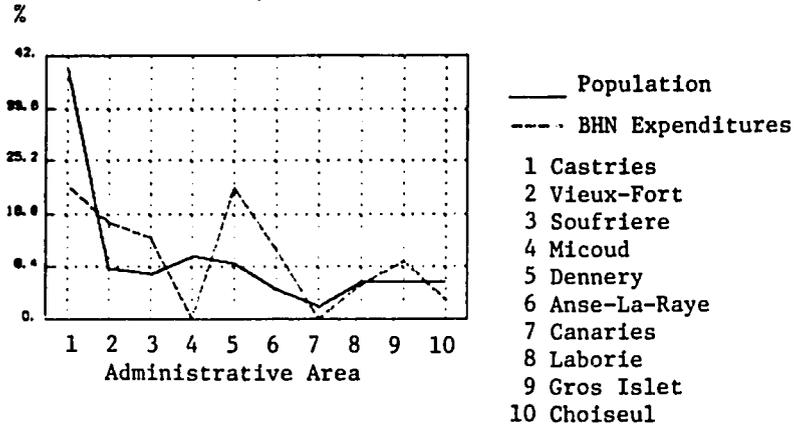
9. Spread or Equity distributions for five countries: Dominica, St. Lucia, St. Vincent, St. Kitts/Nevis, and Belize are given on the following pages.

10. Cost was converted to Utility by calculating the average (mean) and standard deviation for each country. The points are defined on the Utility Function given earlier cost per user was handled similarly, except separate means and standard deviations were calculated for each category of sub-project.

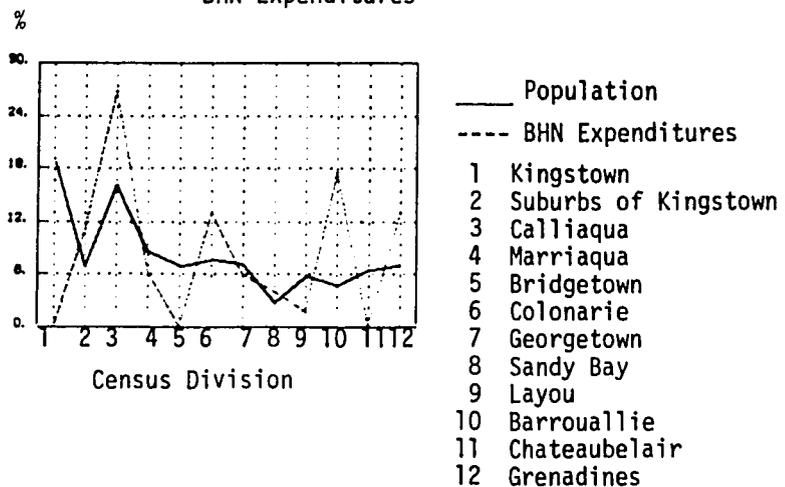
Dominica: Percent Population and BHN Expenditures



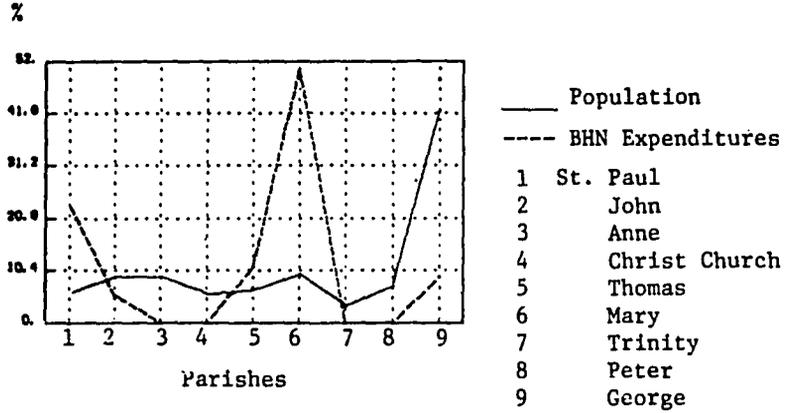
St. Lucia: Percent Population and
BHN Expenditures



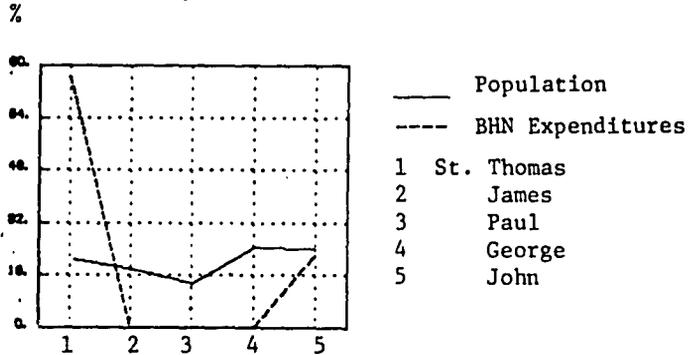
St. Vincent: Percent Population and BHN Expenditures



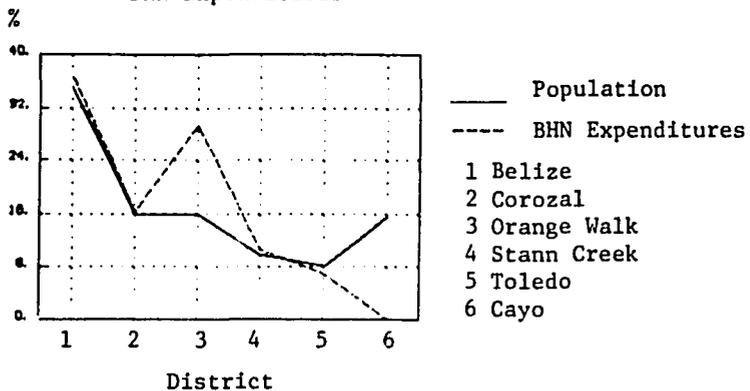
St. Kitts: Percent Population and
BHN Expenditures



Nevis: Percent Population and
BHN Expenditures



Belize: Percent Population and BHN Expenditures



ELIGIBLE SUB-PROJECTS, COSTS, AND IMPLEMENTATION
MODE

Eligible Sub-Projects And Costs
Rank Ordered by Utility/Dominica

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
1.	Water Tank for Scotts Head School	465	276000	St. Mark
2.	Trafalgar Health Centre	399	165600	George
3.	Marigot Health Centre	391	165600	Andrew
4.	Petite Savanne Water System	391	11000	Patrick
5.	Gullet River Health Centre	389	165600	David
6.	Eggleston School	388	69000	George
7.	Wotton Waven School	388	69000	George
8.	Clifton Health Centre	379	165600	John
9.	Coulibistrie Health Centre	379	165600	Peter
10.	Pichelin Health Centre	379	165600	Patrick
11.	Morne Jaune Infant School	378	138000	David
12.	Bellevue Rawle Water System	371	106000	George
13.	Castle Bruce Health Centre Extension	371	391000	David
14.	Morne Prosper School	370	322000	George
15.	Grand Fond Water System	364	40200	David
16.	LaPaine Health Centre Extension	361	391000	Patrick
17.	Petite Soufriere Water System	361	86200	David
18.	Roseau Primary School	361	596000	George
19.	Snake Coe School	360	368000	David
20.	Anse d'Mai Health Centre	359	165600	Andrew
21.	Woodford Hill Health Centre	359	165600	Andrew

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
22.	Dublanc School	350	368000	St. Peter
23.	Scotts Head School	350	276000	Mark
24.	Clifton Water System	342	161500	John
25.	Savanne Paille Water System	342	220400	John
26.	Petite Savanne School	341	414000	Patrick
27.	Trafalgar School	338	368000	George
28.	Warner Health Centre	337	165600	Paul
29.	St. Joseph Water System	324	811100	Joseph
30.	Bellevue Chopin School	318	276000	Patrick
31.	Giraudel Water System	308	440800	George
32.	Weirs/Monkey Hill/North End W.S.	306	176500	Andrew
33.	Westly/Woodford Hill W.S.	288	996200	Andrew
34.	Bellevue Chopin Water System	287	440800	Patrick
		Total	EC\$ 9,305,100	

DOMINICA BNTF

Cost Estimate Rationale

1. Building Construction - The government estimates are based on 1983 costs of EC\$104/sq/ ft. An allowance for inflation in 1984 will be added at the following rate:
(assumes government implementor)

28%	labor (BHN average)	x 5% inflation	= 1.4%
20%	x72% = 14.4%	local materials	x 8% inflation = 1.2%
80%	x72% = 57.4%	imported materials	x 14% inflation = 7.9%
		Total	<u>10.5%</u>

∴ EC\$104/sq. ft x 10.5% inflation = EC\$10.92
use EC\$115/sq. ft

2. Water System - The government estimates are based on 1983 costs. Assuming a non-profit government-run operation and that overhead is included in labor and material costs the adjustment for inflation will be as follows:

38%	labor (BHN average)	x 5% inflation	= 1.9%
10%	x62% = 6.2%	local materials	x 8% inflation = 0.5%
90%	x62% = 55.8%	imported materials	x 14% inflation = 7.8%
		Total	<u>10.2%</u>

DOMINICA BNTF

Implementation Mode

1. Building Construction - The Ministry of Education and Health completed plans for the design of schools using the services of a Peace Corps engineer. An engineering consultant should be used to review the drawings and supervise construction.

The health centres have also been designed. However, a review of the drawings and the supervision of construction should be done by using an engineering consultant.

The Ministry of Communications and Works is currently undergoing a re-organisation. Their current staff consists of one architect and four engineers. If the re-organisation is completed in the near future they should assume some of the design and supervision work.

All construction should be done by private contract as MCW does not have the personnel nor equipment to do the work. There are presently three major contractors and 10 - 15 other contractor on the island who could complete the works.

2. Water Systems

The Central Water Authority has three expat engineers working with them at the present time. Their terms of reference do not, however, permit them to do the design work for these sub-projects. The post of Superintendent of New Works is vacant. Therefore, outside Consultants would be needed to supervise the works.

Construction can be done within the CWA.

Eligible Sub-Projects And Costs
Rank Ordered by Utility/Grenada

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
1.	Soil & Water Management Carriacou	445	186300	Carriacou
2.	Afforestation of Annadle Watershed	403	388100	St. George
3.	St. Paul's Visiting Station (health)	400	130400	St. George
4.	Hermitage Visiting Station (health)	368	130400	Carriacou
5.	Princess Alice Hospital	362	397800	St. Andrews
6.	Tufton Hall Water System	358	332000	St. Marks
7.	Les Avocats Water System	351	442000	St. David
8.	Dougladston Water System	342	420000	St. Johns
9.	General Hospital	339	1269500	St. George
10.	Belair All Age School	336	591000	St. Andrews
11.	Dover Primary School	336	493000	Carriacou
12.	South St. George Primary School	336	542000	St. George
13.	Hillsboroug Jr. Secondary School	327	787500	Carriacou
14.	St. Pauls All Age School	318	1181000	St. George
		Total	EC\$ 7,291,000	

GRENADA BNTF

Cost Rationale

1. Building Construction - All of the schools on the government's proposed list of sub-projects require rehabilitation of existing wooden framed buildings. The advisability of spending money on these structures which are old, termite infested, and would probably not provide adequate protection in the event of a hurricane is questionable.

Therefore consideration is given to new buildings of concrete block with reinforced concrete frame and roof construction. The estimate of square footage requirements for these schools is based on 15 sq.ft/student, plus 25% for circulation.

Estimated Cost = 105 EC\$/sq. ft

Belair All Age School

300 students x 15 sq.ft/student + 25% = 5625 sq.ft

5625 sq.ft x 105 EC\$/sq.ft = 590,625 EC\$

Dover Primary School

250 students x 15 sq.ft/student + 25% = 4690 sq.ft

4690 sq.ft x 105 EC\$/sq.ft = 492,450 EC\$

St. Paul's All Age School

600 students x 15 sq.ft/student + 25% = 11250 sq.ft

11250 sq.ft x 105 EC\$/sq.ft = 1,181,250 EC\$

South St. George Primary School

$$275 \text{ students} \times 15 \text{ sq.ft/student} + 25\% = 5160 \text{ sq.ft}$$

$$5160 \text{ sq.ft} \times 105 \text{ EC\$/sq.ft} = 541,800 \text{ EC\$}$$

Hillsboroug Jr. Secondary School

$$400 \text{ students} \times 15 \text{ sq.ft/student} + 25\% = 7500 \text{ sq.ft}$$

$$7500 \text{ sq.ft} \times 105 \text{ EC\$/sq.ft} = 787500 \text{ EC\$}$$

All other sub-projects costs were adjusted 10% for inflation.

GRENADA BNTF

Implementation Mode

1. Building Construction - All building projects with the possible exception of the St. Paul's and the Hermitage Health Visiting Stations will require engineering consultants. A standard plan was prepared for Health Visiting Stations which could be used for these two sub-projects, however, consultants would be needed for the supervision of work.

Construction should be done by private contractor. The Ministry of Construction and Housing is currently involved with other projects and reportably unavailable for these sub-projects.

2. Agriculture Projects - Although the Ministry of Agriculture has requested technical assistance for other agencies it is doubtful that it will be received in time to aid in the design and implementation of these sub-projects.

In particular a soils conservation expert and a drainage systems engineer will need to be obtained for these sub-projects. Implementation can be done by the Ministry with the assistance of the Ministry of Construction.

3. Water Systems - The Central Water Authority is staffed with the necessary staff to do the designing and implementation of these sub-projects. Construction will be done by force account with supervision by the CWA.

Eligible Sub-Projects And Costs
Rank Ordered by Utility/St. Lucia

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
1.	Vigie Sports Complex	430	68900	Castries
2.	CDC Sports Complex	376	68900	Castries
3.	Forestierre/Ti Rocher Water System	369	96800	Castries
4.	Grand Riviere/Gros Islet Health Centre	368	180000	Gros Islet
5.	Anse La Verdue Water System	361	63400	Canaries
6.	Belle Vue/Vieux Fort Health Centre	358	18400	Vieux Fort
7.	Jackmei Health Centre	358	165000	Anse La Raye
8.	Babonneau Sports Complex	356	68900	Babonneau
9.	Choiseul Sports Complex	356	68900	Choiseul
10.	Desruisseaux Sports Complex	356	68900	
11.	Gros Islet Sports Complex	356	68900	Gros Islet
12.	Anglican Primary School Extension	355	331200	Castries
13.	Saltibus Mains Improvement	352	111300	Laborie
14.	Dennery Filters Water	350	47900	Dennery
15.	Balca/Londenderry Water System	349	35600	Laborie
16.	Babonneau/Paix Bouche Water System	347	178100	Babonneau
17.	Dugard Combined School Extension	347	110400	Soufriere
18.	Garrand/De Barra Water System	347	167800	Babonneau
19.	Tete Chemin Water System	346	41200	Anse La Raye

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
20.	Soufriere Sports Complex	346.	68900	Soufriere
21.	Community Water Projects	342	126500	
22.	R.C. Boys Infant School Extension	332	220800	Castries
23.	Perrot/Vigie Water System	330	132500	Vieux Fort
24.	Etangs/Soufriere Health Centre	326	190000	Soufriere
25.	Micoud Multi-Purpose Centre	323	276000	Micoud
26.	Mourne Dudon School Extension	323	331200	Castries
27.	Jackmel Sports Complex	314	68900	Anse La Raye
28.	Bois D'Inde/Belford Water System	305	129100	Anse La Raye
29.	Marchand Multi-Purpose Centre	303	276000	
30.	Babonneau Multi-Purpose Centre	271	276000	Babonneau
31.	Millet Combined School Extension	261	276000	Anse La Raye
32.	Dennery Multi-Purpose Centre	251	276000	Dennery
		Total	EC\$ 4,608,400	

ST. LUCIA BNTF

Cost Estimate Rationale

1. Building Construction - The cost estimate for school building was adjusted 10.4% inflation (method similar to Dominica) bringing the cost per square foot to 115EC\$. Classroom size is based on the size used in the BHN project (20ft x 24).

Health centre sub-project cost vary due to transportation costs and are all based on using the Marchand Health Centre plan constructed under BHN.

The Multi-purpose Centres proposed by the Ministry of Community Development are assumed to be 2400 sq.ft. in area and use the adjusted cost of 115 EC\$/sq.ft

The MCD estimate for Multi-Purpose Sports complexes was base on six units however, the final project list from the government called for eight units. Cost was adjusted upward.

2. Water Systems - The government estimates were based on 1983 figures. An adjustment of 11.3% was added for inflation.

ST. LUCIA BNTF

Implementation Mode

1. Building Construction - Design work is to be done in the technical section of the Central Planning Unit although the Ministry of Communication and Works still seems to do some project design. The technical section of CPU is a relatively new organisation that appears over-worked, but by using 'standard plans' should be able to complete the work required for the schools and health centres. Consultants should be use for supervision. Construction of these building projects should be by private contractor as no Ministry is designed to do building construction at present.

The MCW would probably be better prepared to design and assist in the implementation of the Multi-Purpose Sports complexes due to the more technical problems of site drainage, electrification, etc. MCD would like to implementate these projects using unemployed youths in the areas concerned.

2. Water Systems - The Central Water Authority in St. Lucia appears to be one of the best ran public service organisations in the Caribbean and is well suited to design and implement the sub-projects dealing with drinking water.

Eligible Sub-Project And Costs
Rank Ordered By Utility/ St. Vincent

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Census Division
1.	Soil Conservation Carapan/ Rivulet	464	286000	Marriagua
2.	Costal Protection Spring	455	572000	Bridgetown
3.	Costal Protection Argyle Rock	445	572000	Marriagua
4.	Costal Protection Langley Park	445	572000	Georgetown
5.	Majorca Water System	433	62000	Layou
6.	Choppins Village Road	417	429000	Calliagua
7.	Fairhall Fairbarn Pasture Road	417	429000	Calliagua
8.	Park Hill - Village Road	405	429000	Colonarie
9.	Mamoon Water System	399	144000	Kingston suburbs
10.	Grenadines - Village Roads	395	572000	Grenadiner
11.	Sandy Bay/Fancy/Higher Lowmans Lowmans W.S.	391	268500	Sandy Bay
12.	John Hill Water System	385	292000	Layou
13.	Dalaway Water System	376	109000	Layou
14.	Medical Stores Kingstown	370	484000	Kingstown
15.	Kingstown Primary School	364	1500400	Kingstown
16.	Reafforestation Grenadines	352	450000	Grenadines
17.	Beguia/Union Island Water Catchments	349	297270	Grenadines
18.	South Rivers Water System	341	834500	Colonarie
19.	Dubois Multi-purpose Workshop	339	295000	Layou
20.	New Grounds Community Centre	330	614000	Colonarie
21.	Vermont Community Centre	330	614000	Layou

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Census Division
22.	New Ground Primary School	321	810700	Colonarie
23.	Park Hill Skills Training - Extension	315	125800	Colonarie
24.	Dauphine Community Centre	310	614000	Calliagua
25.	Georgetown Resource Centre	298	387200	Georgetown
		Total	EC\$ 11,763,400	

ST. VINCENT BNTF

Cost Estimate Rationale

1. Building Construction - The government estimates provided are based on 1983 costs of 110EC\$/sq.ft. Adjustments for inflation will be based on the following rate (assumes overhead is included in labor and material costs and no profit is made):

$$\begin{aligned} 35\% \text{ labor (BHN average)} \times 5\% \text{ inflation} &= 1.75\% \\ 20\% \times 65\% = 13\% \text{ local materials} \times 8\% \text{ inflation} &= 1.04\% \\ 80\% \times 65\% = 52\% \text{ imported materials} \times 14\% \text{ inflation} &= \underline{7.28\%} \\ &10.1\% \end{aligned}$$

$$\therefore 110\text{EC}\$/\text{sq.ft} \times 110.1\% = \underline{121\text{EC}\$/\text{sq.ft.}}$$

An additional increase of 30-35% should be added for construction projects on the Grenadines to allow for transportation of materials.

$$121\text{EC}\$/\text{sq.ft} \times 130\% = \underline{157\text{EC}\$/\text{sq.ft}} \quad - \text{ Bequia}$$

$$121\text{EC}\$/\text{sq.ft} \times 135\% = \underline{163\text{EC}\$/\text{sq.ft}} \quad - \text{ Union}$$

2. Water Systems - Labor and imported material costs are detailed in the government estimates so the inflation adjustment is made in the manner for building Construction.
3. Agriculture - Costs adjusted for inflation.
4. Public Works - Costs adjusted for inflation

ST. VINCENT BNTF

Implementation Mode

1. Building Construction - The Ministry of Communication and Works is presently undergoing re-organisation and staffing. The proposed new staffing does not include any architectural capability. Building sub-projects will have to be designed and supervised by consultants. Implementation of these projects should be done by force account as was done under BHN.

2. Water Systems - The Central Water Authority currently has three engineers on its staff. The proposed sub-projects are all "full determined" and preparations are completed. No outside assistance would be required other than inspections and verification.

Implementation would be done by the CWA using the force account system.

3. Agriculture - Design and implementation should be done by the Ministry of Agriculture using experiences learned from the BHN sub-projects and guidelines set by the Cumberland River Water Shed project being sponsored by U.S.A.I.D.

4. Public Works - Design and implementation of the coastal protection and village road sub-projects should be well within the capabilities of the newly re-organized MCW.

A special note should be made on the village roads for the Grenadines. 1) The road on Union Island should only be considered if it is to complete the section of road built under BHN. 2) The road on Canovan Island probably should not be considered as it does not serve any residential area and it only connects to fishing area. 3) The road on Mayeau is not really a road (there are no vehicals on Mayeau) but should be considered an all-weather foot-path for emergency services.

Eligible Sub-Project And Costs
Rank Ordered by Utility/Antigua

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
1.	Dam Cleaning & Water Shed Improvement	440	360000	Several
2.	Liberta Primary School	362	108600	St. Pauls
3.	Antigua Grammer School	353	265200	St. Johns
4.	Cedar Grove Health Sub-Centre	345	15500	St. Johns
5.	All Saints Main Health Centre	345	46500	St. Peters
6.	Fiennes Institute	343	45700	St. Johns
7.	Storage Facilities for Small Farmers	321	372000	Several
8.	Mental Hospital	313	94500	St. Johns
9.	Bolans Secondary Comprehensive School	298	1210000	St. Marys
10.	Clara Hall Secondary School	298	1008000	St. Johns
11.	Swetes All Age Primary School	275	806400	St. Paul
		Total	EC\$ 4,332,400	

ANTIGUA BNTF

Cost Estimate Rationale

1. Building Construction - BHN construction costs were 94EC\$/sq.ft. Allowing for inflation of 10.5% each year should bring 1984 construction cost to 126EC\$/sq.ft.

For rehabilitation sub-project, 30% will be added to the government estimate. This covers increased costs due to inflation and unforeseen rehabilitation costs.

2. Agriculture - The dam clearing and water shed improvement sub-project estimates have been adjusted for inflation.

ANTIGUA BNTF

Implementation Mode

1. Building Construction - About one half of the building sub-project could be designed by the Ministry of Public Works, although the engineering work would need to be subcontracted out. The Ministry's present building design staff consists of one architect, a quantity surveyor, and no engineers.

Construction of the sub-project can be done by the Ministry of Public Works using a force account mode.

2. Agriculture - The Ministry of Agriculture can design the the dam cleaning and water shed improvement sub-project but would require the assistance of MPW for the design of the Storage facilities.

Implementation could also be done by the MOA with the assistance of the MPW.

Eligible Sub-Project And Costs
Rank Ordered by Utility/St. Kitts/Nevis

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
<u>ST. KITTS:</u>				
1.	Pathology Lab at JNF Hospital	405	84900	St. George
2.	Sandy Point High School	398	574600	St. Ann
3.	Pogson Hospital Extension & Rehabilitation	395	187900	St. Ann
4.	McNite Community Centre	382	132600	St. George
5.	Cayon High School Extension & Rehabilitation	368	950300	St. Mary Cayon
6.	Molineux Primary School Extension & Rehabilitation	366	470200	Christ Church
7.	Cardin Home for Aged Extension & Rehabilitation	364	718300	St. George
8.	Estridge School	363	618800	Christ Church
9.	Sandy Point Post Office & Library	363	442000	St. Anns
10.	Basseterre Primary School	355	2707000	St. George
11.	St. Johnson Village School	355	1727000	St. George
12.	Trabernacle Reservoir	350	331500	St. Johns
13.	Dieppe Bay Water Distribution	337	133700	St. Johns
14.	Trinity Primary School	321	897800	Trinity
15.	Belmont Reservoir & Pipeline	296	362400	St. Johns
16.	Brighton - Oxleys Pipeline Extension	285	82900	St. Mary Cayon

Total EC\$ 10,421,900

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs EC\$	Parish
<u>NEVIS:</u>				
1.	Maddens Livestock Farm Rehabilitation	426	250000	St. James
2.	Burden Pasture Pipeline	343	150000	St. Johns
3.	Vocational School at Charleston	326	466600	St. Pauls
4.	St. Johns Primary School	307	750000	St. Johns
		Total	EC\$ 1,616,600	
		Joint Total	EC\$ 12,038,500	

ST. KITTS - NEVIS BNTF

Cost Estimate Rationale

1. Building Construction - The government estimates are based on a construction cost of 100EC\$/sq.ft minus 40% reported savings on taxes and profits. This 100EC\$/sq.ft figure is one used by Ministry of Public Works which already includes the 40% discount. All figures quoted are 1983 prices, so they have been adjusted 10.5% for inflation.

Similar costs are used for Nevis with an additional allowance for the higher material transport cost.

2. Water Systems - Water system estimates are adjusted for 1984 inflation.
3. Agriculture - The livestock farm rehabilitation sub-project costing was arrived at by removing the cost of the two bulls (which can not be funded under this project) and adjusting the remainder for inflation.

ST. KITTS - NEVIS BNTF

Implementation Mode

1. Building Construction - The Physical Planning Office in the Planning Unit of St. Kitts has prepared rough sketches of all building sub-projects and intends to prepare the detailed design, drawings and estimates for these projects by the time BNTF is ready for implementation. With the services of one architect, a part-time engineer, and four draughtsmen, they propose to complete the documentation on four sub-projects per week over the next few months. This very hurried approach will require careful review of the completed designs.

Nevis, on the other hand, requests the services of a consultant to design their building sub-projects.

The Ministry of Public Works has stated that they could handle the implementation of two or three of the sub-projects. All other projects should be built by private contract.

2. Water Systems - Design and implementation of all water sub-projects can be carried out by the Central Water Authority.
3. Agriculture - The Ministry of Agriculture on Nevis has the staff and experience needed to design and

implement their proposed sub-project with the assistance
of MPW.

Eligible Sub-Projects And Costs
Rank Ordered by Utility/Belize

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs BZ\$	Parish
1.	Kings Park Health Centre Rehabilitation	408	74300	Belize City
2.	Georgeville Health Centre	384	159000	Cayo
3.	Seine Bight Health Centre Rehabilitation	383	44600	Stann Creek
4.	San Ignacio Town W.S.	374	74100	Cayo
5.	Bengue Viejo del Carmen W.S.	369	51600	Cayo
6.	Parasio Primary School Completion	355	123800	Corozal
7.	St. Martin de Porres Community Centre	354	107400	Belize City
8.	Guinea Grass Health Centre	344	159000	Orange Walk
9.	San Jose Primary School Completion	344	81000	Orange Walk
10.	Corozal Town Water System	340	160900	Corozal
11.	Barranco Community Centre	338	93600	Toledo
12.	Chunox Health Centre	332	159000	Corozal
13.	Belize City W.S. Extension	330	271300	Belize City
14.	Belmopan Water System Extension	325	185100	Cayo
15.	Burrel Boom Water System	317	165300	Belize City
16.	Electrification of Indepen- dence Village	317	137800	Stand Creek
17.	Orange Walk Town Water System	314	24600	Orange Walk
18.	Kings Park Primary School Completion	300	554400	Belize City

No.	Name of Sub-Project Activity	Aggregated Utility Score	Estimated Costs BZ\$	Parish
19.	San Benito Poire Community Centre	317	137800	Stand Creek
20.	Vocational Training Centre Belize City	267	610000	Belize City
		Total	BZ\$ 3,374,600	

BELIZE BNTF

Cost Estimate Rationale

1. Building Construction - Local consultants are currently using a cost figure of 90BZ\$/sq.ft. for concrete block structures with reinforced concrete frame and roof. This figure is used in the estimates with the addition of equipment cost were appropriate.

Rehabilitation works will be increased 10.5% for inflation.

2. Water Systems - The government estimates are based on 1983 cost. Assuming a non-profit government run operation and that overhead costs are included in labor and material costs, the adjustment for inflation will be as follows:

39% labor (average) x 5% inflation	= 2.0%
10% x 6.1% = 6.1% local materials x 8% inflation	= 0.5%
90% x 6.1% = 54.9% imported materials x 14% inflation	= 7.7%
TOTAL	10.2 %

3. Electrification - The estimate was adjusted for inflation. It should be noted that the sub-project request for the electrical distribution scheme only and does not include the cost of the generator and house, which have already been purchased and installed.

BELIZE BNTF

Implementation Mode

1. Building Construction - The Kings Park Primary School sub-project will require Consultants to study the existing structure, make recommendations, design the revised structure and supervise the construction.

The community centres have been design and the new health centres will use the "standard plan" developed for the BHN health centre at Hattievville.

Rehabilitation and school completion sub-project will be supervised by Ministry of Works.

Construction of the Kings Park School should be done by private contractor. All other building sub-projects would be built by the Ministry of Works using force account or the appropriate Ministry using self-help labor.

2. Water systems - Design of water systems will be done by the Central Water Authority and implementation will be under their supervision using force account or petty contract labor.
3. Electrification - The electricity prepared the preliminary design of this sub-project but have requested consultants to prepare the final design.

Construction would be by private contract with the power poles being supplied by local labor.

IMPLEMENTATION MODE SUMMARY TABLE

Activity Type	Name of Sub-project	Design Consultants Required	Construction by:	
			Government	Private Contractor
<u>EDUCATION</u>				
Dominica	12	no		12
Grenada	5	yes 5		5
St. Lucia	5	no		5
St. Vincent	4	yes 4	4	
Antigua	5	yes 5	5	
St. Kitts/Nevis	9	no		9
Belize	4	yes 1	3	1
SUB-TOTAL	44	15	12	32
<u>HEALTH</u>				
Dominica	11	no		11
Grenada	4	yes 2		4
St. Lucia	4	no		4
St. Vincent	1	yes 1	1	
Antigua	4	no	4	
St. Kitts/Nevis	3	no		3
Belize	5	no	5	
SUB-TOTAL	32	3	10	22
<u>WATER SYSTEMS</u>				
Dominica	11	yes 11		11
Grenada	3	no	3	
St. Lucia	11	no	11	
St. Vincent	7	no	7	
Antigua	0	no		
St. Kitts/Nevis	5	no	5	
Belize	7	no	7	
SUB-TOTAL	44	11	33	11
<u>AGRICULTURE</u>				
Dominica	0	no		
Grenada	2	yes 2	2	
St. Lucia	0	no		
St. Vincent	2	no	2	
Antigua	2	no	2	
St. Kitts/Nevis	1	no	1	
Belize	0	no		
SUB-TOTAL	7	2	7	0

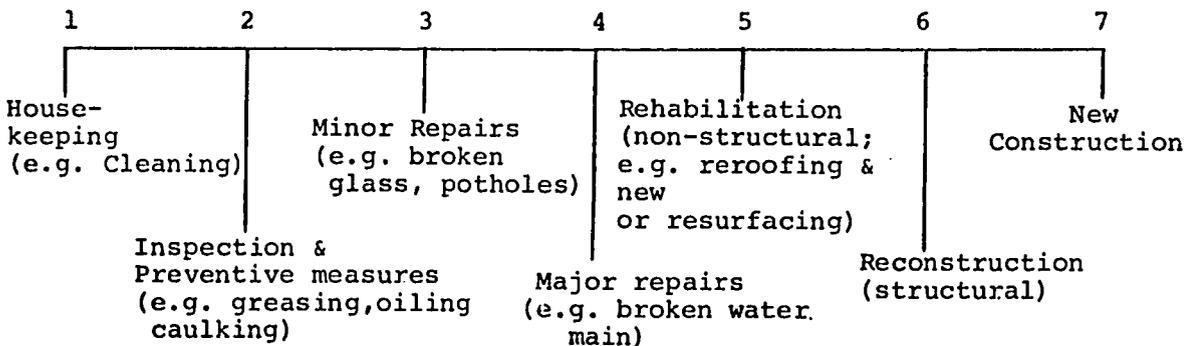
Activity Type	Name of Sub-project	Design Consultants Required	Construction by Government Private Contractor	
<u>COMMUNITY DEVELOPMENT</u>				
Dominica	0	no		
Grenada	0	no		
St. Lucia	12	no	12	
St. Vincent	4	yes 4	4	
Antigua	0	no		
St. Kitts/Nevis	2	no	2	
Belize	3	no	3	
SUB-TOTAL	21	4	21	0
<u>PUBLIC WORKS</u>				
St. Vincent	7	no	7	
<u>ELECTRICAL</u>				
Belize	1	yes 1		1
TOTALS	156	36	90	66

MAINTENANCE SYSTEM DEVELOPMENT

Below we introduce, describe, identify constraints, suggest changes, and propose a BNTF maintenance component.

Introduction

1. One cannot be sanguine about the prospects that the BNTF project may solve the pervasive problem that has plagued all physical infrastructure development efforts in all LDC's for 30 years or more. Nonetheless, the very magnitude of the problem, and the potential pay-off of a solution, however elusive it may be, justifies analysis and merits continued attempts at amelioration.
2. First, a definitional point. The term "maintenance" when applied to schools, clinics, other public buildings, roads, bridges and water systems is used with very different meanings by different persons at different times. It can mean anything from sweeping the floor to complete structural reconstruction or renovation. The various definitions may be pictured as lying on a continuum of increasing complexity as below:



As used, "maintenance" may refer to any or all of the points on the dimension short of point 7 (i.e. new construction). Strictly speaking ^{1/} it should never include points 5 and 6 which involve reconstruction of an entire building or road segment, but it does sometimes. An example of such usage is shown in the quote below from one of the participating countries:

"In addition to the three Primary Schools which have been rehabilitated by CDB/USAID, there are four other Primary Schools in need of immediate repairs, and will qualify^{2/} under the Schools Maintenance Programme."

In this report, we shall use the term "maintenance"

to mean activities 1 through 4 only and recommend such usage to others in the interest of clearer communication. We shall use the term "routine maintenance" to refer to activities 1, 2, and 3 only. The routine maintenance of school buildings and clinics can thus be broken down into three main activities:

- a) Housekeeping - dusting, cleaning, removal of garbage etc. and cleaning ditches, gardening and cleaning of grounds.
- b) Preventive measures - inspecting, minor painting, greasing and oiling of locks and hinges, caulking of windows, etc.
- c) Repair of damaged or broken components such as windows, doors and furniture, stopping of leaks in roofs and walls, major painting.

3. Further, by way of introduction, the BHN history and precedent is relevant. The BHN Project Agreement with the CDB contained a Special Covenant that CDB would obtain from each country:

^{1/} The dictionary meaning is the act of keeping something in good condition, state, or operation.

^{2/} Emphasis ours; apparently some schools do not qualify for the "maintenance" program.

"evidence of a commitment to continue maintenance of the sub-project activity and an explanation of how this maintenance will be provided for."

Also in Annex I of the Project Agreement:

"prior to making a disbursement for school construction, rehabilitation, furnishing or maintenance in a participating country, the CDB will obtain from that country the following:

- a) A time phased plan for bringing all primary schools under a revised and improved maintenance system. Such a plan will outline the specific measures to be taken and anticipated costs involved."

These provisions were largely ignored under the pressure of quick implementation. A further problem was one of definition as discussed Paragraph 2 above. The plan called for in the Project Agreement Annex would seem to refer to routine maintenance, but the token plans submitted by the various governments took the term to include major repairs, rehabilitation, and reconstruction. BHN also funded a school maintenance seminar and the consultants produced a multi-volume report.

Country Descriptions and Local Constraints

The information below is based on short interviews with staff from the various ministries in the countries visited. Although a few supporting documents were collected, our schedule did not permit verification or observation of maintenance activities. We therefore cannot vouch for the accuracy of the facts or figures. With this caveat, we present the information collected for the relevant sectors by country.

Dominica

1. The basic figures are:

<u>Category</u>	<u>Budget</u>		<u>Staff Supervisors</u>	<u>Other Resources</u>
	<u>Current</u>	<u>Previous</u>		
Schools (primary only)	75,000	75,000 (90,000 spent) ^{1/}	0/1	Local workmen and petty contracting
Public Works (Roads & bridges only)	2.64 Mil	2.4 Mil	175	Petty contracts, Road caretakers
Water	276,000	252,000	18/1	7 vehicles

2. In December 1979, early in the BHN Project, Consulting Engineers Partnership, Ltd carried out a fairly extensive study of school maintenance in Dominica. They were charged with assisting the Government in establishing a maintenance unit within the MOE and a system of continued^{2/} and preventive maintenance. In January 1984, our visit indicated that planning for school maintenance was not systematic, did not include regular staff^{3/} and did not provide for scheduled preventive maintenance. A sample vignette of current conditions is pictured in the attached letter from the Bense School.

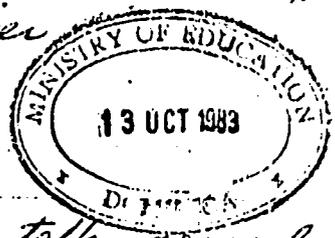
^{1/} Labor about 40%

^{2/} Emphasis ours

^{3/} With the exception of a Maintenance Supervisor

Govt. School,
Basse.
7th Oct., 1983

The Chief Education Officer
Education Division



Rosera,
Dear Sir,

There is much talk nowadays in Health circles about typhoid - the way it is spread and preventive measures. Two officers from the Health Division visited the school on Thursday the 6th and spoke to the pupils on the subject emphasizing among other things, the proper use of latrine.

The Health officers concern, Sir, has prompted me to remind you of the present deplorable state of the school latrine.

But for the drab appearance, leakage and the damaged wire gauge I would not even bother to complain. The fact is, however, that all the SEATS are damaged and at least two rooms have had to be put out of use - seriously reducing the sitting capacity which results in some pupils resorting to the bush - the worst measure the Health officers condemned.

It goes for a fact that the authority has plans to carry out repairs at this school. It will, therefore, strongly recommend that the latrine repairs be undertaken as a matter of urgency.

P.T.O.

Respected father
Abhinav P. K. Bhatt
from.

3. The procedure for carrying out maintenance in the primary schools is as follows:
 - a. The principal reports the defect to the Chief Education Officer by letter. (See sample from Conlibistre School attached)
 - b. Maintenance Supervisor^{1/} goes out to investigate and cost out the repair; then recommends action to the Permanent Secretary of the Ministry of Education(MOE).^{2/} (See Conlibistre report attached)
 - c. If total cost is under EC\$1000 can approve it; if over EC\$1000 it must go to the Minister of Finance for approval.
 - d. On approval, Maintenance Supervisor gets local workmen to do the repair.
 - e. Maintenance Supervisor later inspects and certifies that work has been satisfactorily completed before payment is effected.
4. The four secondary schools are each said to have their own small maintenance budget, totalling EC\$19,100 for the year and ranging from 2000 to 8800 each.

5.

Although reports conflicted, one source claimed that 50% of their maintenance activities were in response to demand (i.e complaints) 50% routine and periodic (if not wholly scheduled). Their 18 men are organised into six teams of three each: a pipefitter, an assistant, and a laborer. Three Area Supervisors exist (for the East, West and South regions of the island). Potable

1/ Post established in 1981.

2/ Emergency repairs, like blocked toilets, are said to be carried out first, and approval gotten later.

20th December, 1983.

FROM: Maintenance Supervisor
TO:
SUBJECT: COULIBISTRIE GOVERNMENT SCHOOL

I visited the school on Friday 16th December 1983 at 11.00 a.m. The Principal Mr. F. Bruney said the roof leaks several places and therefore, needs complete recovering.

He also pointed out in order for me to make a proper assessment of the roof condition I will have to visit the school on a rainy day. However, estimate for recovering three quarters (3/4) of the roof of the school building and to re.electrifying it are as follows:..

Galvanize roof covering

Galv. sheets 8 ft long	250 @ \$27.60	=	\$6900.00
" " 6 ft	50 @ \$20.70	=	\$1035.00
" " 8 ft			
(turret)	50 @ \$27.60	=	\$1380.00
Capping	12 @ \$19.90	=	\$ 238.80
Galv. roofing nails	1 box @ 120.00	=	120.00
			<hr/>
Material Cost			\$9673.80
Labour Cost			2600.00

Cost for covering roof

\$12273.80
=====

water supplies are chemically tested once a month in rural areas; twice a month in urban centers. The biggest maintenance activity is cleaning of water intakes, and repairs to broken or leaking mains. Cleaning of storage tanks is said to take place at least every 6 months, as is inspection of valves. There are no written schedules or standard inspection forms, however.

6. The PWD has primary responsibility for roads and bridges only. They report that 60% to 70% of their budget goes to rental of equipment from the Government Central Garage.^{1/} PWD maintenance work is carried out in part by force account partly contracting. The latter is used for keeping road-side drains clean and vegetation cut. Some sections of feeder roads have local caretaking whereby two (2) people get paid EC\$776 per month to take care of a three-mile stretch. Road patching is done by force account. Building and electrical inspection has a budget of only EC\$10,000 currently. The budgeting process allows only a 10% increase over the previous year, regardless of need. A 15-month road maintenance training program is due to be completed in February 1984.

7. Some specific constraints found in Dominica were:

^{1/} Recently taken out of PWD reportedly on pressure from CIDA to make the garage financially independent, and now charging PWD commercial rates.

- a. Water authority's maintenance tools are in bad condition.
- b. Lack of : chain hoist to remove big boulders from water intakes, transport, staff training capability.
- c. Shortage of plumbers for school maintenance.
- d. Unionization said to cause high wages and low productivity in DPW; personnel rotation results in uneven quality of work.

GRENADA

1. Budget and staff figures for maintenance of the relevant sectors were not readily available, we surmise, due to the recent political upheaval. Netherless, some information was gleaned from the short interviews.
2. Grenada, unlike the others has a Ministry of Construction. Their current six (6) months budget is EC\$600,00 for the Roads Division. They combine the maintenance and rehabilitation functions. Their equipment is rented from the Central Garage. There is no Maintenance Officer post as such in the Ministry.
3. Ministry of Education did not know how much money they had available for school maintenance. Though they mentioned a small repair team (set up in August 1983) there is no officer in the Ministry of Education responsible (other than Permanent Secretary) of about thirty (30) maintenance requests received in the last six (6) months (mostly plumbing), only five (5) had been repaired at the time of the interview. Thirty five (35) (out of sixty-six (66) primary schools, plus all seventeen (17) secondary schools have Parent-Teachers Associations. In addition these schools have Caretaker Committees, we were told.
4. The water system divides the island into six (6) areas, each with a Supervisor for Maintenance and Operations. Each area has 2-3 crews with four (4) men per crew, or about sixty (60) total. They have sixteen (16) vehicles, three (3) of which were down at the time. Cleaning silt from dams is a major activity.

5. Specific constraints in Grenada were:
 - a. Lack of survey of public buildings
 - b. Lack of maintenance equipment
 - c. School vandalism
 - d. Very slow maintenance work rate

ST. LUCIA

1. Budget and staff figures are:

<u>Category</u>	<u>Maintenance Budget</u>		<u>Staff Supervisors</u>	<u>Other Resources</u>
	<u>Current</u>	<u>Previous</u>		
Schools	500,000	630,000 (spent 652,000)	2 Building Maintenance Officers	1 vehicle Petty con- tracting
Health	500,000	na	na	Local Care- taker Committees
Public Works	750,000 (for drainage \$6.5 million for roads)	na	13 foremen	Petty con- tracting
Water	382,000	na	24	Petty con- tracting

2. Ministry of Education stated that systematising of school maintenance is a top priority. The procedure at the moment is that a school principal ratifies the District Education Officer or the Ministry of a maintenance problem. Authority for maintenance expenditures has to come from the Ministry. The two Building Maintenance posts are newly staffed for the first time (one since October 1982, the other since November 1983). They report having established fourteen (14) self-help projects in the schools within the last quarter. PTA's exist in half of the schools.
3. The Ministry of Health has established three Permanent Caretaker Committees (at Fond Assau, Tiroche Nicaud, and Entrepot). Their maintenance budget has not been 'voted'

by the legislature, but is furnished under special warrant MOE consults DPW on any job over EC\$10,000.

4. DPW's main responsibilities are: drains, roads, bridges and flood control. They recognise the need for greater involvement of the people who use the facilities to produce better maintenance.

5. The principal maintenance activity of the water staff is repair of mains (20 to 30 per month). They do have a scheduled service Reservoir Cleaning Program and a check-list for pump maintenance (see attached).

6. Specific constraints:
 - a. lack of standardised control panels
 - b. lack of staff training (to be provided by Caribbean Basin Water Management Program)
 - c. lack of commitment and performance standards for maintenance work.

St. Vincent

1. Budget and staff figures for the relevant sectors are as follows:

<u>Category</u>	<u>Maintenance Budget</u>		<u>Staff/ Supervisors</u>	<u>Other Resources</u>
	<u>Current</u>	<u>Previous</u>		
	EC\$			
Public Works				
- Buildings	500,000 ^{1/}	1,900,000	21 posts ^{2/} (14 filled)	
- Roads	3,650,000	4,153,000	22 posts ^{2/} (14 filled)	
Health	350,000	na	3/1	contracting
Water	430,000	160,000 (spent 160,000)	100	8 vehicles

2. DPW carries out maintenance function for the schools and health centers with funds from those respective ministries. They contract out only specialized work, e.g. air conditioning repairs. Organisationally, there is one General Engineer Assistant responsible for roads, and one for public buildings.
3. MOH has a staff of one plumber, one electrician, one generalist. A new post of Maintenance Officer is planned. MOH is working with their counterparts in Barbados and St. Lucia to set up a regional capability for high level maintenance (i.e. of sophisticated equipment).

1/ Note apparent large decrease from previous year, if the reported data are correct.

2/ Excluding daily hired.

4. The Central Water Authority staff of 100 is organized into nine crews. Storage tanks and control valves are inspected weekly, we were told. They are being asked to install more meters^{1/} by lending agencies, but are apprehensive of the increased maintenance requirements this will place on them. Their total estimated revenue for 83/84 is EC\$1,426,500 with expenditures of 2,450,600, or about a EC\$1 million deficit.

5. Specific St. Vincent constraints:

- a. Lack of control - tools disappear from DPW.
- b. Many water distribution lines are old and need replacement.
- c. Lack of on-the-job training (OJT) and technical assistance for the water system.

^{1/} At present, metered sales constitute only 22% of total.

ANTIGUA

1. No budgetary statistics were available.
2. With regards to schools:
 - a. there are about 50 maintenance requests per month; 60% of which are said to get repaired that same month (by DPW);
 - b. Ministry of Education does not have its own maintenance budget; would like to have a maintenance crew funded by BNTF.
 - c. One forth of the schools have PTA's.
3. DPW has the responsibility of 300 buildings including the schools. Their staff is said to include: 20 carpenters, 20 masons, 16 plumbers and 16 electricians.
4. Specific Antigua constraints:
 - a. School vandalism; students unprepared for new improved school environment.
 - b. Poor public attitudes: parent complaints if head-teacher forces pupils to pick up litter.
 - c. Lack of fencing and watchman for schools
 - d. DPW is opposed to Ministry of Education having their own maintenance capability.

St. Kitts/Nevis

1. Some statistics are given below:

<u>Category</u>	<u>Maintenance Budget</u>		<u>Staff Supervisors</u>	<u>Other Resources</u>
	<u>Current</u>	<u>Previous</u>		
	EC\$			
Public Works (St. Kitts)	350,000 ^{1/}	325,000	25-30/2	na
Public Works (Nevis)	42,000	na	10-12	na
Water System (St. Kitts)	820,000	750,000	50 (include 20 pipe-fitters and 2 pump inspectors)	5 vehicles
Water System	cal65,000	na	30	1 vehicle
Schools (Nevis)	22,000 (for 8 primary schools)	na	1 caretaker per school	na

2. The Public Works Department (PWD) is generally responsible for routine maintenance and small repairs for all the public sector except the water system and caretaker activities at the schools.
3. The most important frequent maintenance problem encountered in the schools is with the toilet facilities (i.e. stuck toilets, broken soats, etc.). Most frequent water problem is broken pipes (averaging 10/week on little Nevis alone).

1/ Building maintenance only

4. The joint water maintenance budget averages out to about EC\$23 per person per year. The average yearly charge for public water piped into a dwelling is EC\$27 for average household of 5, or about EC\$5.50 per person.

5. Most maintenance carried out is in response to demand; very little is scheduled preventive maintenance. Yet, the streets appear rather clean in St. Kitts. Also the three existing Community Centers on St. Kitts are said to be maintained by self-help efforts. This suggests that the local socio-political fabric contains threads---attitudes and/or structures that one might harness or build upon.

6. Specific constraints reported or inferred were:
 - a. Lack of widespread and mobile supervision pressing for higher maintenance standards.
 - b. On Nevis, lack of an engineering technician or water engineer to decide on proper pressure or where to make connections; no water piping plan.

General Constraints

1. Financial - Every country, and almost every ministry interviewed mentioned lack of funds as an obstacle to better maintenance (sometimes even when the previous year's maintenance budget had been underspent). This constraint must be seen in its context. It is as much an effect as a cause in the chain of events leading to inadequate maintenance. After all, budgets are proposed by Ministers of Governments, voted by legislators and represent, in part, the priority attached to the maintenance function by the leaders of the country. Priorities are value judgements reflecting a person's (or country's) attitudes, convictions and values - in short, his (their) 'motivational configuration'. Why maintenance is not perceived to have higher priority (and allocated a larger share of available funds) will be considered under various headings below. In any case, funds budgeted for maintenance bear little or no relationship to the number of buildings to be maintained or to the magnitude of the problems.

2. Technical - There is a lack of certain technical skills (e.g. plumbing) in some places; adequate tools in others; transport capability elsewhere. But with regard to routine maintenance, these are relatively minor factors in our estimation, and largely the result of the financial constraint.

3. Institutional - Factors hereunder constitute major constraints in our view. With some exceptions, there is in general:
- a. lack of organisation
 - b. lack of job descriptions
 - c. lack of standardized maintenance procedures
 - d. lack of management control (resulting in slow, poor quality work and pilferage).
 - e. lack of incentive and recognition for superior maintenance work
 - f. lack of career ladders for professional advancement
 - g. lack of adequate communication and coordination (eg. almost none of the relevant staff interviewed were aware of the existence of the school maintenance manuals developed under BHN; no Community Development presence at meetings for community schools and community clinics).
 - h. lack of authority commensurate with mid-level maintenance manager's responsibilities; eg. lack of periodic personnel performance reports denies the manager his supervision leverage. The senior staff (i.e. Ministers and Permanent Secretaries) seem torn between their pragmatic ambition to develop responsible subordinates and their bureaucratic reluctance to delegate authority and decentralise.
4. Psycho-Cultural - The physical proximity of the Eastern Caribbean Islands to the US Mainland is deceptive if equated to proximity in attitudes and value system - particularly those having to do with maintenance of buildings, roads and equipment. That 'motivational configuration' is very distinct from the norm held in the US (or other industrialized countries) and is typical of the low value placed on maintenance of inanimate objects in LDC's generally^{1/}. The motivational hierarchy that Maslow postulates at the individual level

^{1/} Differences in childhood socialization patterns and influences here would come into play

may further have some application here. The desire to keep machines well oiled, the roof from leaking, and the road free of potholes is a 'higher order' cultural value that never become operative until a certain critical mass of lower motives (closer to survival) are satisfied. This cultural constraint carries considerable importance. Not only does it impinge on why maintenance budgets are inadequate but it also influences the quality of maintenance work done and the failure of maintenance skill training programs and seminars to achieve their objectives. The dynamic for the latter comes from a basic formula of human behaviour, (i.e.
$$\text{Work Performance} = \overset{\text{A}}{\text{Skill level}} \times \overset{\text{B}}{\text{Motivation}} \overset{\text{C}}{\text{.}}$$
 Training programs (whether at the technician level or the manager's) address element B, by and large: teaching the participants What, Where, When and How to do maintenance. But element C is the driving force i.e: Why do it? B and C are not additive but multiplicative, so that even if the learned skill levels are very high, the output A will be very low if the motivation is low $\frac{1}{}$. This formulation also partially explains the phenomenon whereby the work performance of a seminar participant may be much improved immediately after returning from the training, but gradually regresses to the status quo antea ----- it is not a case of forgetting the new skills learned, it is that adequate motivational supports for the new behavior do not exist.

1/ A very large number multiplied by zero is still zero.

5. Foreign Aid Dependency Syndrome - In this analysis we must recognise a fundamental contradiction between physical infrastructure, grant type aid on the one hand, and donor interest in improving, systematizing, and institutionalising routine maintenance functions on the other. Such infrastructure aid is allocated, budgeted, funded on the basis of NEED -- the more run-down, dilapidated, and neglected a school, clinic or road becomes, the more likely the external funding. There is thus a powerful and constraining disincentive to self-reliant, regular, routine maintenance to prevent the need for subsequent major rehabilitation/construction.

6. Grass-root Involvement - Given constraints 1-5 above, a possible counter-lever might be found if the local townspeople perceived the school, clinic or community center as THEIRS, rather than as something put there by the government or USAID (with or without prior consultation with local leaders and residents). But the reality of local involvement (and the resulting predisposition to be at least concerned about maintenance conditions) cannot be engendered by rhetoric at ribbon-cutting ceremonies. The constraint we are pointing out is that with the exception of certain proposed sub-projects in St. Lucia, St. Kitts and Belize, there was no indication for most of them of any substantial community interest, involvement, or consultation.

7. Political - In our estimation, there is a lack of political will at the top to bring about the structural and attitudinal changes necessary for improved maintenance throughout the society. Moreover, there is also a lack of political pressure from below due to the cultural values discussed earlier and due to the low visibility of the problem (unless one is a pupil, teacher, patient, or nurse, groups not known for their political power). The difference in visibility and political influence of the users also explains, in part, why road maintenance generally gets more attention than building maintenance.

Reform Possibilities

We first examine and reject a traditional approach, and then consider various other options.

1. We do not believe that maintenance training courses or workshops for Public Works Department or Ministry of Education staff will work. The institutional, motivational, financial and political constraints described above appear to be insurmountable in the near or medium term. Certainly they are impervious to "quicky" training interventions. An analogy may make our point more vivid: Picture a mythical LDC where the inhabitants for centuries have been, and still are very unkind to dogs, cats, and other lower animals - they don't feed or water them very well, never attend to their health and are sometimes cruel to them. Incomes a Humane Society and organizes training courses on: How to take care of your pet, nutritional requirements, cleanliness, health, periodic checks by a vet, immunizations required, early warning signals of sickness. Few would expect such a training program to change behavior towards the animals.
2. There are some other options which though they might work, have little chance of being accepted. E.g:
 - a. A pervasive national awareness program for the condition of "our schools, clinics, and other public infrastructure. The political will would need to be expressed forcefully by the P.M. and endorsed without reservation by the Cabinet. Radio and T.V. would have to be used widely with effective messages designed to change attitudes. Special uniforms

or hats could be issued to give Maintenance Staff an esprit de corps. A national lottery could be held to provide funds. Yearly essay contests held on maintenance related topics. Maintenance Technology added as a subject on the GCE -O'level examination so that Industrial Arts departments would teach the relevant skills; etc, etc.

- b. That BNTF fund no sub-project on the basis of need, but only on the basis of concrete self-help and self-reliance forthcoming for the respective activities.
 - c. That BNTF fund only revenue producing sub-projects, i.e. water, sewer, electricity or roads; the revenue or a portion there to go into a special maintenance account, not the General Fund and controlled by an appropriate. Road projects to be funded only on the stipulation that auto license fees be raised and the increased revenue similarly earmarked and controlled for maintenance activities. (In Grenada, for example, auto license fees have increased only 10% in 8 years)
 - d. That USAID become more cognizant of the cultural constraint and more realistic about the foreign aid dependency syndrome and fund outright the routine maintenance of BHN and BNTF sub-projects - protection on the investment, as it were. A foreign contractor could be engaged for this and he might start some serious institution building efforts. If a contractor is not involved, perhaps PL480 or similar funding could be used.
3. Less ambitious reforms will have a better chance of acceptance. They are: a) More local involvement - 55% of the proposed BNTF activities are community schools, community clinics, and community centers. Each of those sub-projects should have a Community Advisory Group established before the fact, e.g. before ground is broken in the case of new construction. The Community should have a voice in site selection and be informed of construction plans and schedules. The Advisory Group might also set up a Construction Committee to act as a clearinghouse between the Project Supervisor/Contractor and local artisans and laborers

who would be interested in working on the activity. (For schools, preference in hiring might be given to persons who will have children attending) This committee could subsequently change functions to a Caretaker Committee to watch over building security and routine maintenance.

b) Better Housekeeping and Building Security - For example Dominica is reported to employ only eight (8) caretakers for more than 60 primary schools.^{1/} Vandalism is reported to be a considerable problem on most islands. We would suggest that each school, clinic, and community center must have its own daytime caretaker (duties: housekeeping, inspection and preventive measures, i.e. Points 1 and 2 on our definitional scale in the Introduction to this section); and where vandalism is a problem, a night-time Watchman, as well or as an alternative, a secure metal fence or high wall. Speaking practically, we see no alternative to external funding of such an activity, perhaps on a gradually decreasing basis. c) Convince Industrial Arts departments of comprehensive high schools to assume some responsibility for inspection, preventive measures and minor repairs (i.e. Points 2 and 3 of the scale) at least in their own school. We suggest that such activity be cast as a practicum for the students and an opportunity for the teachers to be relevant and important in a concrete way.

1/ 1979 data

- d) Establish and potentiate "Building and Maintenance Units" at Ministry of Education and Ministry of Health, with responsibility for inspection, minor repairs and major repairs to their schools/clinics. The inter-ministerial procedure of involving the Department of Public Works^{1/} seems rather cumbersome and confuses budgets. This suggestion seeks to shorten the bureaucratic communication and authorization lines.

1/ And sometimes the Ministry of Finance

Maintenance Systems Development Component: Demonstration and Refinement

1. Our concept for a maintenance component entails a test of two different approaches in two or more countries totalling \$500,000 to \$1 million over three (3) years.
2. One scheme involves the establishment of a Building and Maintenance Unit at the Ministry of Education. We propose Belize as the site for this since they have submitted a proposal to that effect (see attached).
3. The other approach we propose for testing is increased local involvement, and better housekeeping and security. We see St. Lucia, St. Kitts and/or Dominica as logical choices for this demonstration, assuming those governments and relevant ministries are interested. St. Lucia already has Caretaker Committees for some health centers. BNTF should support the extension of the concept to more clinics and to schools. But it can't be imposed. A local person (perhaps from the Community Development Department) must identify "ripe" towns and villages before AID involvement is announced, Dominica should be considered because a proposed organisation and staffing is already written for that island (in the CEP report). The following excerpts are quoted therefrom:

3. Organisation and Staffing

- 3.01 The emphasis in establishing a maintenance system should be placed on the maximum use of persons living in the villages and towns serviced by the schools. This ensures to a large extent that some of the parents of the pupils would feel responsible for the condition of the school, and would be involved in the work of maintenance and respond promptly to calls for maintenance and minor repair work.
- 3.02 It is essential therefore that Parent Teacher Associations, if not already in existence, should be formed at all schools, and encouraged by the Headmaster and officers of the Ministry of Education to get involved with the maintenance needs of the school, especially with the needs of housekeeping and inspection.
- 3.03 Self help is being encouraged in Dominica and other States in the region and the many housekeeping and minor repair chores lend themselves to self help efforts by the communities in which schools are located.
- 3.04 It is proposed therefore, that the first level of organisation for maintenance be the Parent Teacher Association. This Association must receive continuous support and moral assistance from the Headmaster and Ministry, and should be trained and encouraged to take a vital role in the maintenance of the school.

3.05 The functions of the PIAs would be to (a) assist the Headmaster in inspecting the school and providing a checklist of defects: (b) organising and assisting village self help groups in sharing with the caretaker and staff and students such tasks as:

- . play ground maintenance - repairs to the surface
- . minor 'touch up' painting
- . correction of minor erosion problems around the base of the school
- . planting of flowering shrubs and landscaping
- . minor repair of furniture

3.06 Material and tools to support the activities outlined should be supplied by the Ministry and be under the control of the Headmaster. It is suggested that an average of US\$10 per month per school be made available for such support.

3.07 The second level of organisation for maintenance should be at the village or district level, and should involve the representatives of the PTAs, the village council, the Headmasters, a representative of the Ministry of local Government and a representative of the Ministry of Education. This committee whether formed at the village level or as a sub-committee of the existing District Education Committee, should meet about once every 3 months and be concerned with the following:

- . General conditions of the schools
- . Allocation of the housekeeping functions which are to be

shared by the PTA, the teachers and students and caretaker.

- . Discussion of reports of inspection of the schools within each district
- . Formulation of specific requests to the Ministry for major repairs and additional furniture or equipment.
- . Examining and reporting on the work done by the PTAs. and formulating incentives to encourage the proper functioning of the PTAs.
- . Assist the Ministry in establishing and regulating the use of the school building and plants.

3.08 This last function indicates that the advisory functions of the Maintenance Committee go beyond maintenance and extend to the use of the school during evenings, weekends and school holiday periods for adult education and other community activities.

3.09 No funds are specifically allocated to the work of this committee as it has an advisory role only. This committee however brings together the views of the Ministry of local Government, Ministry of Education, Ministry of Works and the persons affected by the problems - the villagers. This form for involvement of the villagers is important to the continued understanding of the maintenance problems and would provide an appreciation of the financial and other limitations imposed by economics and geography.

- 3.10 The third level of organisation for maintenance is the Ministry of Education itself. The Ministry is responsible for the provision and maintenance of all Government owned school buildings and school plant, but it can only exercise its functions properly if there is co-operation from the school staff, pupils and villagers and continuous liason between the Ministry, the school headmaster and the maintenance committees.
- 3.11 It is proposed that there be a building maintenance unit established within the Ministry of Education and staffed by
Superintendant of Buildings
2 Building Inspectors
- 3.12 The duties, qualifications and salaries of the staff are as follows:
- (a) Superintendant of Buildings
- (i) To be responsible to the Permanent Secretary, Ministry of Education for maintenance and construction of all school buildings and plant owned by the Government of Dominica. The Superintendant of Buildings will be responsible for ensuring that the funds allocated to the Ministry of Education for maintenance and construction are spent in accordance with the policies of the Ministry of Education, and will note expenditures on work done on maintenance and construction of buildings and plant.

(ii) The Superintendent of Buildings will be expected to make at least twice yearly visits to the schools to acquaint himself with the problems of maintenance and the work done by the PTAs, contract tradesmen, caretaker and other persons and groups involved in carrying out the maintenance work on the school.

(iii) The Superintendent of Buildings will be expected to prepare annual budgets for the maintenance and repair of each school, in co-operation with the Headmaster and local Government Commissioner. The grade of this officer should be that of Senior Executive Officer (Grade 14 - 10) and at an annual salary of EC\$10 080 (US\$3 733). Qualifications should be an HNC certificate in Building or equivalent plus 10 years relevant experience.

(b) (i) Building Inspectors

The Superintendent of Buildings should be supported by 2 Building Inspectors - one for the areas north of Roseau and Petite Soufriere and another for Roseau and the areas south.

(ii) The Inspectors would be the officers having intimate contact with Headmasters, PTAs and Villager Councils. An inspector would be expected to do the following:

Liase with the Headmaster of each school, and to

visit and inspect each school at least once every 2 months.

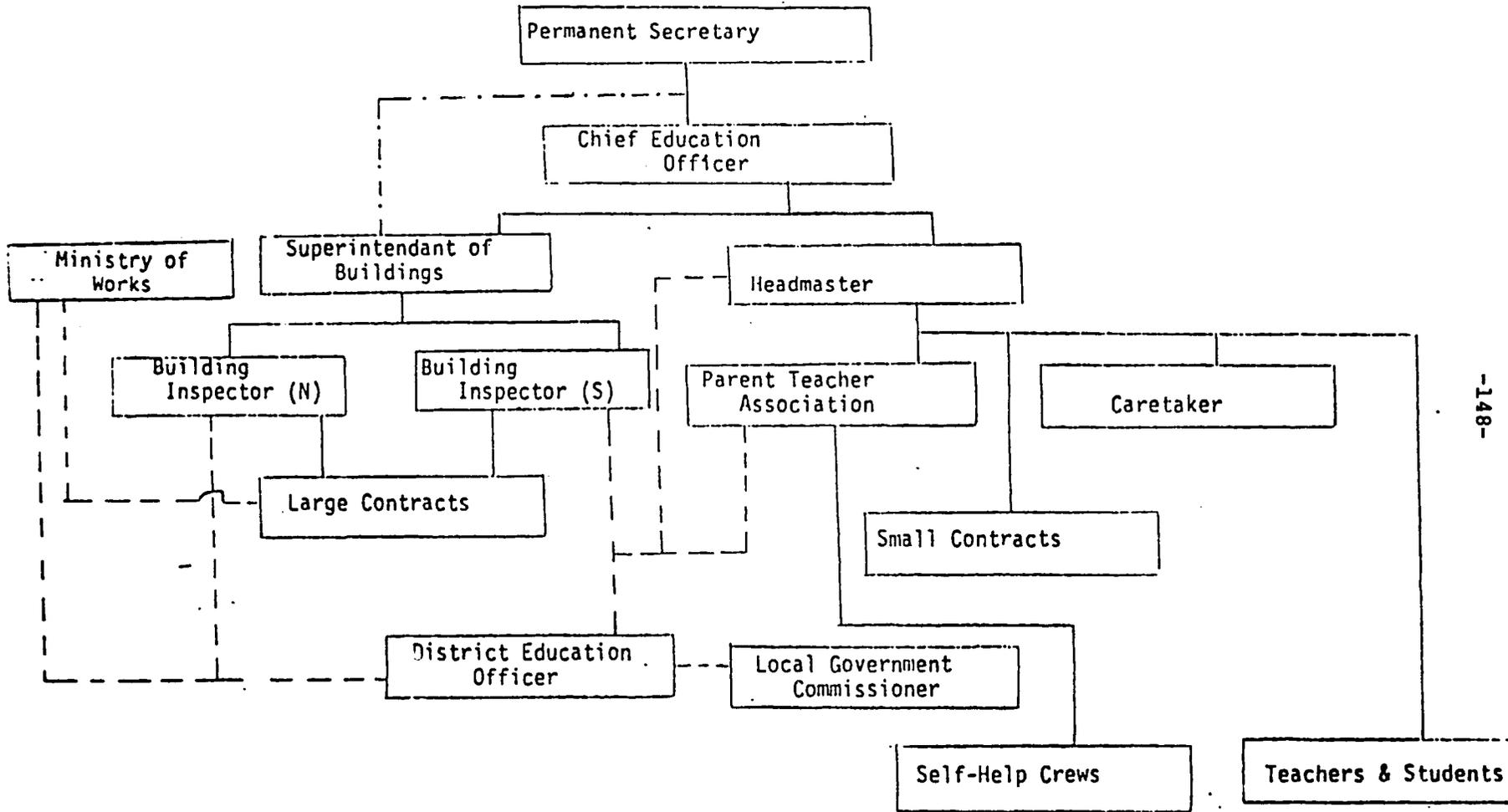
- . Inspect the school buildings and premises and report to the Superintendent of Buildings.
- . Represent the Ministry of Education at meetings of the district education committee.
- . Supervise the issuance of contracts costing more than EC\$500 and approve such contracts.
- . Supervise construction work costing more than \$1000 and certify payments due.
- . Provide annually details and estimates of cost of maintenance repair and additions to be done to each school in co-operation with the Headmaster of each school.

(iii) It is proposed that the inspectors be graded Executive Officers (C17-14) and at annual salaries of about EC\$8160 (US\$3022).

(iv) The Inspectors should possess certificates in Building equivalent of HNC plus about 5 years relevant experience.

3.13 The administrative structure and organisation of the Building Maintenance Unit is shown in Appendix 2.

Organization of Administration of School Building Maintenance Programme in Dominica



----- New works only
 - - - - - Advisory function

4. As part of this component, we also propose an independent evaluation study to investigate:

- a) maintenance of BHN sub-projects and
- b) early results of the BNTF demonstration efforts

We see this evaluation taking place mid-point in the LOP of BNTF.

5. Tentative maintenance component costs are:

<u>Element</u>	<u>Amount</u> <u>(US\$000)</u>
Maintenance operations (include labor and material)	300
Salaries	75
Vehicles and other equipment	100
Public Information	50
Technical Assistance and Training	100
Travel and Miscellaneous	20
TOTAL	<u>645</u>

6. We do not suggest allocating maintenance money 'across the board' to all the countries as was done in BHN. The various governments should be probed for their interest in serving as the locus of a routine maintenance demonstration sub-project and the funds allocated accordingly.

7. We envisage a well-designed media campaign as part of the 'local involvement' approach. The T.A. should cover both approaches. It should include: guidance, analysis, trouble-shooting, inspiration, training, and documentation planning (base line and comparison information, etc.)

BELIZE

1. Project Title:

The establishment of a Building and Maintenance Unit at the Ministry of Education.

2. Project Description

- 2.1 Belize has an area of 8,867 square miles. It is approximately 200 miles long from North to South and 70 miles wide from East to West. The population according to the 1980 Census was 145,353 of which 51% live in rural areas. 60% of the population are under 20 years and of these 37,000 are enrolled in primary schools and 7,000 in secondary schools. The country is served by 60 pre-schools (4 Government and 56 private), 226 primary schools (16 private, 187 Government-aided and 23 Government) and 25 secondary schools (7 Government and 18 Government-aided). Primary schools are spread throughout the country from Sarteneja in the North to Crique Sarco in the extreme South, from Caye Caulker in the East to Arenal in the extreme West. Attached is a table showing the distribution of schools by district and whether situated in urban or rural areas. The list shows only the school and teachers' houses for which the Ministry is wholly or partly responsible. Private schools are wholly maintained by their proprietors.
- 2.2 At present primary schools are overcrowded especially in the urban areas. Besides overcrowding most classrooms are drab, uninspiring and in many cases the buildings are in terrible state of disrepair.
- 2.3 The population of Belize may be small but the birth rate being 2.12% and with existing adequate health care the population is increasing rapidly putting a heavy burden on the nation's resources. In the fiscal year 1982/83 the national budget was \$186,688,425.00 and out of this \$21,253,176.00 was allocated to education. In the same fiscal year, Government spent \$541,006.00 in new school buildings and teachers' houses and \$99,341.45 in the maintenance of existing school buildings and teachers' houses. These amounts represent 50% matching grants to denominational schools, therefore, the total spent on a national basis was \$1,082,012.00 for new plants and \$198,682.90 for maintenance.
- 2.4 The present system of building and maintenance needs to be rationalized. Government-aided school buildings and teachers' houses are planned by denominational authorities and once approved are constructed by them. Supervision is done by Ministry of Works but because of shortage of staff, there is no adequate supervision and more often than not there are overhead costs. Construction of new Government school buildings and teachers' houses and maintenance of existing buildings are done by Ministry of Works. Maintenance of Government-aided schools is done on an ad-hoc basis by the different denominational authorities without Ministry supervision but Government must meet 50% of the costs.

- 2.5 In all this the Ministry is concerned that we are not getting value for money. We believe that with continuous supervision by qualified personnel more can be done with the same funds. With additional funding and qualified personnel to oversee our building and maintenance programme, we believe that a dent can be made in improving the working and living conditions of our teachers and at the same time better the learning environment and ultimately the learning of our children.
- 2.6 With adequate and improved classrooms and better houses for teachers, it is envisaged that qualified teachers will be attracted to rural areas where they are most needed. This may also serve to stem the tide of rural migration to urban areas in search of quality education.
- 2.7 The Ministry of Education proposes to rationalize the building and maintenance of school buildings and teachers' houses by establishing a Building and Maintenance Unit to:
- 2.7.1 Approve the design of new buildings, costing and to supervise the actual construction from the initial stages to completion.
 - 2.7.2 Conduct a survey of all educational physical plants - classrooms, storerooms, teachers' houses, sanitary facilities, water supply and sporting facilities.
 - 2.7.3 Mount continuous surveillance of the state of repair of all educational plants and draw up maintenance programme with costing.
 - 2.7.4 Carry out approved preventive and remedial repairs throughout the year.
 - 2.7.5 Draw up periodic national building programme for schools and teachers' houses to be used in the Development Plan.
- 2.8 The Unit is to be established this year and will be the direct responsibility of the Permanent Secretary.

3. Summary Table

- 3.1 The application is for seed money to establish the Unit, operate it and to carry maintenance work during the first year. Thereafter, the Unit will become a charge against the Government Budget.

3.1.1 Salaries

1 Engineer (structural)	- \$12,192.00
2 Building Supervisors at \$8,364.00 each	- 16,728.00
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Sub-total	\$28,920.00

3.1.2 Funds:

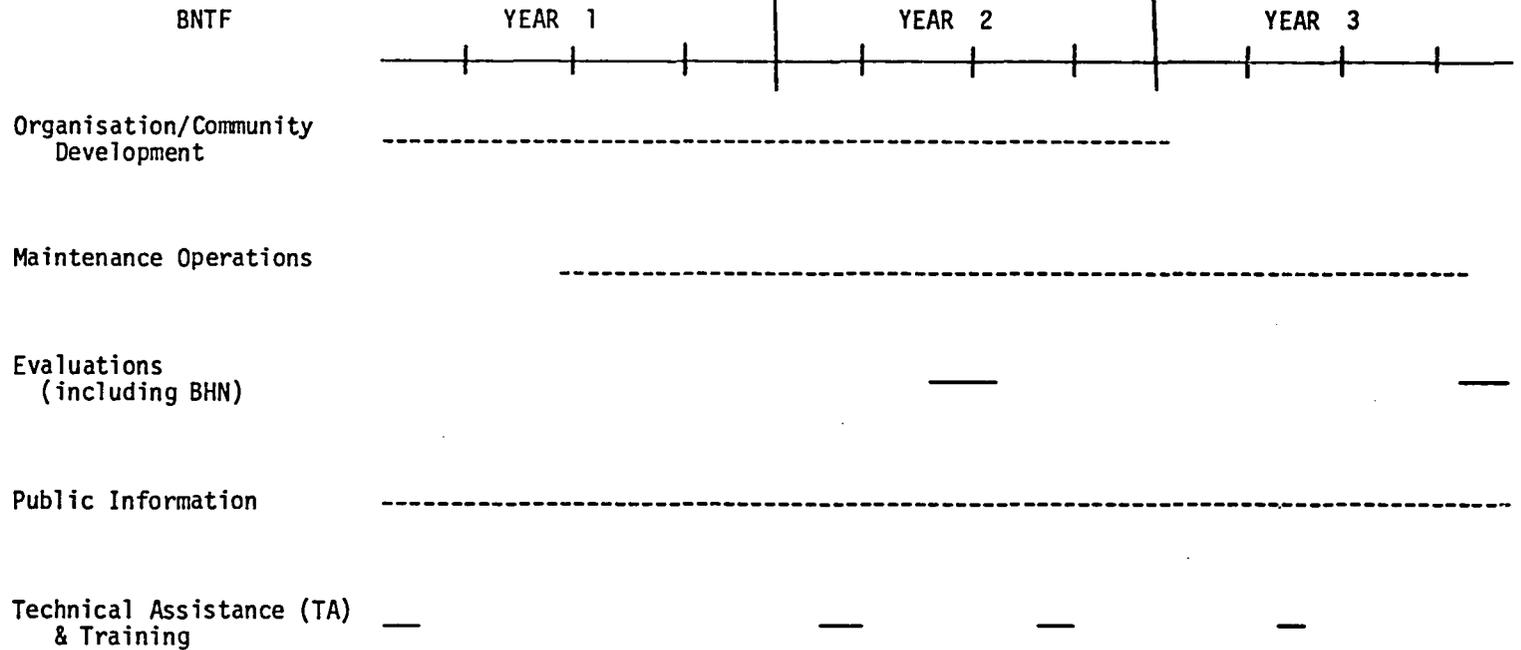
(i)	To purchase 2 two-ton pickup trucks at \$20,000.00 each	- \$ 40,000.00
(ii)	To meet operational costs of vehicles for 1 year at \$7,000.00 each	- 14,000.00
(iii)	To cover expenses of maintenance to schools and teachers' houses for 1 year	- 300,000.00
(iv)	To mount workshops on maintenance for Principals, Managers and Education Officers	- 15,000.00
		<hr/>
	SUB TOTAL	\$369,000.00
		<hr/>
	GRAND TOTAL	\$397,920.00

3.2 Government of Belize will provide office accommodation, support staff, materials and other operating expenses.

Ministry of Education, Sports and Culture
Belmopan
16th February 1984

T I M I N G

The tentative timing we envisage is as follows:



KEY NOTE:

----- Intermittent activity
————— Continuous activity