

**UNCLASSIFIED**

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
Washington, D. C. 20523

CARIBBEAN REGIONAL

**PROJECT PAPER**

ST. KITTS-NEVIS RESOURCE MANAGEMENT  
PROJECT

AID/LAC/P-197

Project Number:538-0108

**UNCLASSIFIED**

**PROJECT DATA SHEET**

1. TRANSACTION CODE

A A = Add  
C = Change  
D = Delete

Amendment Number \_\_\_\_\_

DOCUMENT CODE

3

2. COUNTRY/ENTITY

St. Christopher and Nevis

3. PROJECT NUMBER

538-0108

4. BUREAU/OFFICE

Latin America/Caribbean (LAC)

05

5. PROJECT TITLE (maximum 40 characters)

St. Kitts-Nevis Resource Management Project

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY  
09 30 87

7. ESTIMATED DATE OF OBLIGATION

(Under 'B:' below, enter 1, 2, 3, or 4)

A. Initial FY 84 B. Quarter 4 C. Final FY 85

8. COSTS (\$000 OR EQUIVALENT \$1 = )

A. FUNDING SOURCE	FIRST FY 84			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	( 870 )	( 130 )	( 1,000 )	( 1368 )	( 632 )	( 2,000 )
(Loan)	( - )	( - )	( - )	( - )	( - )	( - )
Other U.S.						
1.						
2.						
Host Country	-	-	-	-	350	350
Other Donor(s)	-	-	-	-	-	-
<b>TOTALS</b>	870	130	1,000	1368	982	2,350

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ESF	233	060		-	-	1,000	-	2,000	-
(2)									
(3)									
(4)									
<b>TOTALS</b>									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE COD

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code  
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To establish appropriate soil and water management practices in demonstration areas on agricultural land and to strengthen the institutional capacity to maintain and extend these management practices.

14. SCHEDULED EVALUATIONS

Interim MM YY MM YY Final MM YY  
0 2 8 6 0 8 8 7

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000  941  Local  Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment.)

17. APPROVED BY	Signature	Date Signed	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
	Title		
	William B. Wheeler Director	09 28 84	

/

PROJECT AUTHORIZATION

NAME OF COUNTRY: St. Christopher and Nevis

NAME OF PROJECT: St. Kitts-Nevis Resource Management Project

NUMBER OF PROJECT: 538-0108

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the St. Kitts-Nevis Resource Management Project for St. Christopher and Nevis (the "Grantee") involving planned obligations of not to exceed two Million United States Dollars (\$2,000,000) in grant funds ("Commitment") over a thirty-six month period from the date of authorization, subject to the availability of funds in accordance with the A.I.D.

OYB/allotment process, to help in financing foreign exchange and local currency costs for the project. The planned life of the project is three years from the date of obligation. First year funding will be one million United States Dollars (US\$1,000,000) and future increments will be provided subject to the availability of funds and the agreement of AID and the Grantee to proceed with the Project.

2. The Project ("Project") consists of assisting the Grantee in establishing appropriate soil and water conservation practices on agricultural land by financing a program of ghaut stabilization, field terracing, surface water development, watershed management and related agricultural activities.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegation of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate:

A. Source and Origin of Commodities

Commodities financed by A.I.D. under the Project shall have their source and origin in St. Kitts-Nevis or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have St. Kitts-Nevis or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

B. Conditions Precedent to Disbursement

1. First Disbursement. Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An opinion of counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Grantee, and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms;

(b) A statement of the name of the person holding or acting in the office of the Grantee specified in Section 8.2., and of any additional representatives, together with a specimen signature of each person specified in such statement; and

(c) Evidence that the Grantee has established an accounting system for the project which is in conformity with generally accepted accounting principles applied on a consistent basis.

2. Disbursement for Other Than Professional Services. Prior to any disbursement or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made for other than professional services, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A time-phased implementation plan for all project activities including: a schedule for procurement of equipment, supplies, construction services, training, and technical assistance; a schedule for civil works design and construction, field terracing, and agricultural extension in St. Christopher; and a schedule for plan development and sub-project execution in Nevis; and

(b) Evidence of the designation of project coordinators who will be responsible for the day-to-day implementation of project activities for both the St. Kitts and Nevis components of the project.

3. Disbursement for Civil Works In St. Kitts. Prior to any disbursement or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made for any particular civil works activity under the project (including construction materials related to civil works), the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A detailed engineering design, cost estimate, construction schedule, management plan and economic feasibility analysis for the particular activity;

(b) Evidence that land use policy in the project site areas allows for the provision of an adequate buffer zone for tree plantations at the edges of gullies and in the upper watershed where required; and

(c) Evidence that the vacant position of soil conservationist within the National Agricultural Corporation's (NACO) Agricultural Engineering Department has been filled.

4. Disbursement for Sub-Project Activities in Nevis. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for sub-project activities, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A detailed sub-project description including technical design specifications, cost estimates, implementation plan, and economic feasibility analysis; and

(b) Evidence that a Nevis land unit has been established and staffed, with adequate office space and provision for financing the unit's day-to-day operations.

5. Disbursement for Lavington/Lynches Project Element. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for the work to be performed in the Lavington-Lynches Area, the Grantee will, except as the Parties may otherwise agree in writing, furnish A.I.D. in form and substance satisfactory to A.I.D., a settlement plan for the Estate, including but not limited to, a system for providing long term land tenure security for farmers on farm plots on the Lavington/Lynches Estate, a system for selecting the farmers for settlement on the land, and a scheme of providing the farmers with necessary production assistance.

6. Disbursement for Equipment Procurement. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for equipment procurement, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A list of proposed equipment, cost estimates, and a maintenance plan; and

(b) Evidence that adequate staff has been provided to carry-out the objectives of this project as specified in Section C 3 below.

### C. Special Covenants

1. Agricultural Development Policies. The Grantee covenants to review its land use, soil conservation, water resource management, and land tenure policies for the islands of St. Christopher and Nevis taking into consideration the results and recommendations of the technical assistance provided under this project and to review these and related areas important to the development of agriculture with AID periodically during the life of the project.

2. Equipment Utilization. The Grantee covenants to utilize equipment provided under this project for activities similar in nature to those carried out under this project for a period equalling the useful life of the equipment.

3. Personnel. The Grantee covenants to provide such personnel as are necessary to assure the effective implementation of the project. This will include a soil conservationist/agricultural engineer, work crews, an agricultural extension agent and an equipment operator in St. Christopher and two agriculturalists and an equipment operator in Nevis.

William B. Wheeler  
William B. Wheeler  
Director, Regional Development  
Office/Caribbean

27 Sept 1981

Date

Clearance

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AADO:MMaxey MM  
A/RLA: FMeighan BM  
CONT:RWarin RW  
CPO:KFinan KF  
C/DR:POrr PO  
PRMCCoulter CC  
D/DIR:TBrown TB

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ST. KITTS-NEVIS  
RESOURCE MANAGEMENT PROJECT

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LIST OF ABBREVIATION AND ACRONYMS

AID	-	Agency for International Development
BDD	-	British Development Division
CAEP	-	Caribbean Agricultural Extension Project
CARDI	-	Caribbean Agricultural Research Development Institute
CDB	-	Caribbean Development Bank
CIDA	-	Canadian International Development Agency
EDF	-	European Development Fund
ESF	-	Economic Support Fund
IARM	-	Inter-Agency Resident Mission
IFB	-	Invitation For Bid
LSGA	-	Limited Scope Grant Agreement
NACO	-	National Agricultural Corporation
PIO/C	-	Project Implementation Order/Commodities
PIO/P	-	Project Implementation Order/Participant Training
PIO/T	-	Project Implementation Order/Technical Assistance
PSC	-	Personal Services Contractor
PWD	-	Public Works Department
RDO/C	-	Regional Development Office/Caribbean
RFP	-	Request for Proposals
RFQ	-	Request for Quotations

# I. SUMMARY AND RECOMMENDATIONS

## A. Recommendations

### 1. Funding

RDO/C recommends that an ESF Grant of \$2.0 million be authorized, of which \$1.0 million is proposed for obligation in FY 1984 for the St. Kitts-Nevis Resource Management Project in St. Christopher and Nevis, with a Project Assistance Completion Date (PACD) of September 30, 1987.

### 2. Geographic Code

The Project Authorization will specify that, except as A.I.D. may otherwise agree in writing:

a. Goods and services financed by A.I.D. under this Project shall have their source and origin in countries included in A.I.D. Geographic Code 000 or St. Christopher and Nevis; and,

b. Ocean shipping financed by A.I.D. under this Project shall be only on flag vessels of the United States or St. Christopher and Nevis unless an ocean freight waiver has been approved and unless the conditions specified therein have been complied with and the appropriate certification made.

## B. Summary Project Description

The Project will establish appropriate soil and water management practices in demonstration areas on agricultural land and will strengthen the institutional capacity to maintain and extend these management practices. In St. Kitts, the Project will undertake the stabilization of three types of gully erosion situations and terrace 135 acres of fields. The improvements in the gullies will consist of channelization, construction of drop structures, reinforcement of critical points, and planting of trees to stabilize the banks. At the terracing sites, persons who are farming the gullies and higher slopes will be offered long-term leases on improved land and provided technical assistance to set-up farms using appropriate soil and water management practices on the newly terraced land. In Nevis, the Project will establish a Land Unit within the Department of Agriculture and will support the Unit in preparing and implementing a Surface Water Development Plan and a Watershed Management Plan. A series of small sub-projects will be undertaken including such activities as building catchment ponds and improving catchment areas, improving springs and wells, and establishing an agro-forestry nursery. The Project will provide additional personnel, technical assistance, equipment, training and capital funds to undertake these activities.

## C. Summary Project Findings

This Project is ready for implementation and is considered socially, financially, and economically sound, and technically and administratively feasible.

D. DAEC Concerns and Design Guidelines

The concerns and issues raised at the DAEC review of the Project Identification Document (PID) for this Project are as follows:

1. On St. Kitts the Mission should work toward seeking a commitment from the Government to work toward the transfer of public lands to the private sector.

The Project's Lavington/Lynches field terracing/small farmer component directly addresses this issue. Through the activities described in Section II.C.1., the Project will directly support the transfer of agricultural lands to private farmer cultivation. Through this initial demonstration effort and a covenant regarding agricultural policy dialogue, the Project seeks to encourage the Government to continue divestiture efforts.

2. The Mission may wish to seek a Government commitment to crop diversification, especially on lands no longer suitable for sugar production.

In developing the small farmer component of the Lavington/Lynches area, the Government was requested to relinquish cultivation of some of its marginally producing cane lands for small farmer settlements and crop diversification demonstrations. The Government concurred in this request and a plan for development of this area is required in a Condition Precedent to Disbursement. A definition of the desired program is described in Annex H.

3. Procedures for transferring public land to private farmers on Nevis should be discussed in the Project Paper.

Nevis is in the process of establishing a Land Development Corporation whose responsibilities would include administering the sale of public lands to private individuals. The establishment of this Corporation follows the Government's decision to encourage private ownership through the sale of property at market rates. Rates are set at EC\$12,000 per acre for non-resident buyers and EC\$6,000 per acre for purchasers who are currently residing on the property.

The Land Unit which this Project seeks to establish will participate in installing the basic infrastructure and in establishing procedures, policies, and guidelines for land divestiture in agricultural areas.

4. The economic analysis should be developed using the cost-benefit scenario and incorporating both indirect benefits from Project activities as well as the additional costs of crop diversification.

The Economic Analysis contained in Section IV.C employs cost-benefit techniques and estimates the internal rate of return for each of five project components. Time limitation precluded--and conditions precedent to disbursement obviated the need for--detailed economic cost-benefit analyses. For Lavington-Lynches, the one project component that is not constrained by substantive conditions precedent, the analyses is more authoritative and costs of diversification are explicitly included. The additional time prior to disbursement of funds for the other four major project components will allow a more complete analysis to be carried out.

5. Analyze the capability of the Government and private farmers to maintain the civil works on an ongoing basis.

The stabilized gullies and terraced cane fields will be maintained by the forces of NACO who currently carry out this responsibility in an effective manner. A discussion of this issue is located in Section IV.A.3.

The terraced fields will be maintained by the resident farmers under the guidance of the Project Coordinator, CARDI, and the Government's extension service. The logistics of this arrangement are discussed in Annex H.

6. Describe a plan for training farmers and Ministry of Agriculture employees in proper cultivation and conservation techniques and seek a covenant to have the Government submit a procedure based on the plan for carrying out this training.

Training of Ministry employees and small farmers in terrace maintenance procedures will be accomplished through on-the-job training. The Project Coordinator, who will be a trained soil conservationist/agricultural engineer, will be the primary person responsible for coordinating Ministry extension agents, CARDI personnel, and farmers for training through required field maintenance exercises. Following significant on-the-job training, two employees of the Ministry of Agriculture will be sent away on short courses to reinforce their field experience. A discussion of the training plan is described in Section III.C.

7. The Mission should seek a NACO commitment to fill its soil conservation position prior to Project implementation.

The Agricultural Engineering Division currently consists of a Peace Corps Volunteer who is the acting soil conservationist. A person has recently been hired to fill the position of host country soil conservationist. This person will be the PCV's counterpart and will attend to the conservation activities currently in NACO's work plan. There is another candidate for soil conservationist for this project, but hiring depends on a financial allocation. The Grant Agreement will require the filling of the second post as a Condition Precedent to Disbursement and will fund the salary of the incumbent.

8. Discuss the implementation alternatives of force account civil works construction vs. hiring out the construction to a local contractor.

Civil Works construction will be performed under the direction of NACO and the Public Works Department. At the conclusion of this Project it will be their responsibility to replicate, in other situations, what NACO and PWD have learned during project implementation. It is therefore imperative that they learn proper procedures by carrying out the work under this Project.

9. Confirm that this Project will not directly involve the production, marketing or processing of sugar.

This Project will not increase the production, improve the marketing, nor improve the processing of sugar. The Project will terrace approximately 95 acres of sugar land to prevent the loss of topsoil. The Project will also stabilize gullies to prevent loss of agricultural land. These activities will not increase yields but will prevent further decreases in yield. The object of these activities is to prepare land for eventual transfer to private farmers as part of a crop diversification effort.

E. Contributors to the Project Paper

The following individuals contributed to the development of this Project Paper:

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## II. PROJECT RATIONALE AND DESCRIPTION

### A. Rationale

#### 1. Background

St. Christopher-Nevis (St. Kitts-Nevis) achieved independence in September 1983. During the past year the newly elected Government, in cooperation with various donors, began a series of studies necessary to define the most pressing areas for development assistance and the constraints to achieving recommended objectives. Results of the agricultural studies indicate that the first priority of St. Kitts should be resolution of the land tenure issue which impedes: Government development of sugar lands; diversification into other agricultural crops; small farmer development schemes; and other agricultural programs.

It is evident from discussions with both public and private sources in St. Kitts that the Government has every intention of settling the long-standing land tenure problem by paying a fair market rate to the previous owners who chose not to cultivate their land and who are pleased that the Government is willing to buy the land. However, the debt is estimated at approximately US\$7.4 million and the financing mechanisms are still under consideration. In addition to the difficulties presented by tenure, the identification of agricultural programs has been constrained by the land capability and diversification studies which are being prepared by other donors for consideration by the Government, but which have not yet been finalized. It is within this context that AID has been asked to provide financing for an agricultural project.

Nevis has a similar history of Government control over a portion of private property, however on that island landowners abandoned their property long ago and the Government has unincumbered title. The Government is attempting to encourage private participation in food crop production but finds that the primary constraint is water resource development and resource management. Lack of water impedes all development in this rather dry and rocky island where irrigation is essential to commercial farming. A Canadian International Development Agency (CIDA) funded exploratory well drilling program for both St. Kitts and Nevis has begun but is approximately a year away from implementation in Nevis. The European Development Fund has agreed to assist with building two reservoirs and either EDF or BDD will probably provide a water engineer. The results of these donor activities are necessary precursors to any major AID participation in the area of agricultural development because a water supply is a necessary condition to expanding commercial agriculture.

An additional major constraint to all natural resource development activity in Nevis is the lack of a soil and water management implementing agency. Activities which need to be carried out in the areas of surface water development, soil conservation, afforestation, irrigation management, etc., are impeded by lack of expertise, equipment and staff. A comprehensive BDD-funded development plan for Nevis indicates that any efforts to begin implementing conservation activities will require the establishment of a land use unit.

## 2. Economic Setting

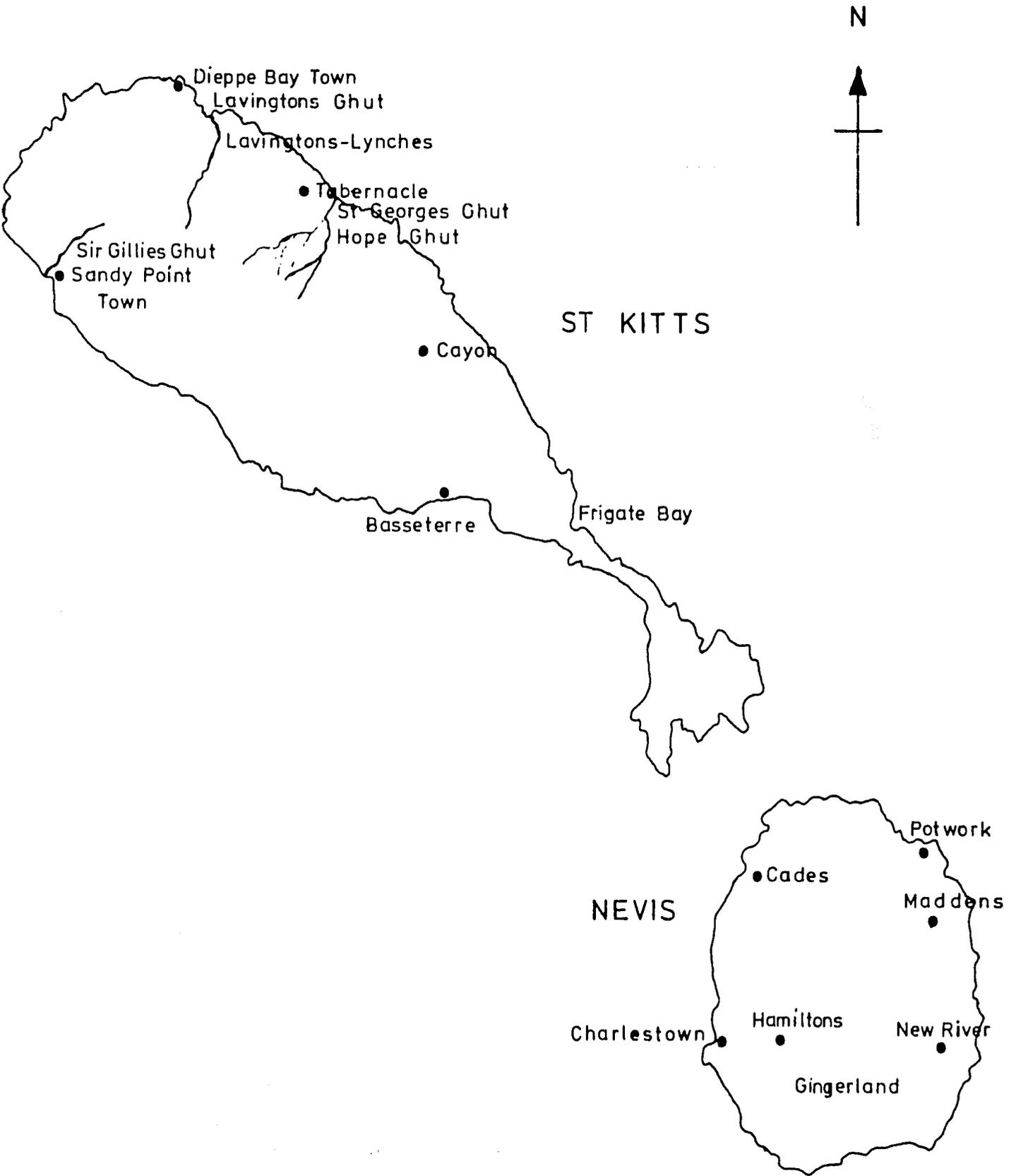
The population of St. Kitts is estimated at 34,500 and Nevis at 9,000. See Figure 1 for map of St. Kitts-Nevis. The population has been declining as a result of outward migration and is anticipated to remain at the present level. Of the combined population, the labor force consists of 14,900 people of which approximately 13,600 are employed; 33% in agriculture, 26% in tourism and service industries, 22% in manufacturing, 15% in Government and 4% in construction. Under current conservative population projections, there will be 2,500 unemployed persons seeking work by the year 1990. Within the various employment sectors, the wage rate for agricultural employees is 30% lower than average while the wage rate of Government employees is 32% higher.

Sugar has historically been the backbone of the economy and currently contributes 25% to the Gross Domestic Product (GDP). Sugar was cultivated in both St. Kitts and Nevis, but production in Nevis was abandoned starting in the 1800's and was completely abandoned by the early 1960's. The sugar industry in St. Kitts was collapsing in 1975 when the Government assumed responsibility for the industry at the request of the private owners. A process of economic diversification started in the mid-1970's and has been taking place since then, although the economy is still highly dependent on sugar. The diversification has taken place through: the establishment of new assembly-type industries such as electronics, garments, and electric equipment; through the expansion of tourism; and through the expansion of non-sugar agriculture (mainly cotton, vegetables, and livestock).

The public investment program previously focused on major transportation projects and as a result the basic infrastructure is established; the country has a large international airport, a deep water port, and a good road system. Currently the public investment program emphasis has been shifting from infrastructure to productive areas such as agriculture, industry and tourism in order to make the economy less vulnerable to sugar price fluctuations. This new investment program averages US\$6.5 million per annum and is in line with the absorptive capacity of the public sector but will depend largely on external financial assistance.

## 3. Agricultural Sector Strategy

The agricultural sector strategy of the Government of St. Kitts-Nevis is to diversify agriculture and at the same time improve efficiency in the sugar industry. Specific delineation of this strategy is proceeding hand-in-hand with studies financed by various donor organizations. Recognizing the vulnerability of the economy to sugar market fluctuations, the Government requested a two part study to be carried out with BDD funding by Booker Agriculture International Limited. The sugar industry study concludes that because of the existing sugar processing factory size, the production target of 30,000 tons of sugar per year should not be reduced, but that this quantity should be maintained through reduction of the area under cane cultivation and improvement of production techniques, rather than through additional production on marginal lands. Improved techniques are viewed as utilization of irrigation, mechanization, and soil conservation.



ST KITTS NEVIS PROJECT  
SITE LOCATIONS

FIGURE 1

The diversification study has not yet been completed but debriefing of the Bookers' consultants indicates that constraints such as irrigation, marketing, and agricultural extension need to be resolved prior to effective increased diversification. Both studies recognize that prior to implementing their recommendations two major issues must be resolved. The Government must resolve the land tenure issue and a land use policy must be implemented.

Compensation for the land acquired by the Government in 1975 is basically a financial issue. No payments were made after the land was expropriated and a recent court decision declared the expropriation unconstitutional. Since the former land owners do not want the land returned to them, the compensation must be paid. This will be a difficult financial issue for the Government no matter how favorable the payment terms, and there is no guarantee that when the \$7.4 million is paid that the money to former land owners will be invested in St. Kitts-Nevis.

The Government recognizes the need to decide and enforce a land use policy and requested that the InterAgency Resident Mission (IARM) finance a land capability study. The study was recently completed by Pragma Corporation and is under review by the Government. Results of the study should lead to more judicious decisions regarding the use of land for new hotel and factory construction, for soil conservation efforts, and for transferring sugar lands into private non-sugar crop cultivation.

Nevis is one small step ahead of St. Kitts in its agricultural sector strategy since it does not have to deal with the tenure issue or with abandoning sugar. Its agricultural strategy is to provide private farmers with the opportunity to profitably produce food crops and livestock for local consumption. Activities in support of this strategy have been delineated in a very specific development plan and are geared toward resolving the constraints to profitable production. They include development of water sources for irrigation, preparation of land for small farmer settlement, establishment of a land use unit, etc.

#### 4. Project Strategy

In order for A.I.D. to respond to an FY 84 request by the Government of St. Kitts-Nevis for assistance in carrying out its public sector investment program in agriculture, it was necessary to determine an area of assistance not impacted by the unresolved tenure issue and not contingent upon the results of studies being undertaken by other donors. Two such areas of focus are soil erosion in St. Kitts and natural resource management in Nevis. Both are areas of critical importance to increased agricultural output as well as to small farmer participation in production, and both are of major importance in sustaining non-sugar agricultural development.

##### a. St. Kitts

One of the key impediments to increased agricultural production in St. Kitts is the continued loss of top soil. Erosion of the land involves dislodgement and transport of surface soil materials. St. Kitts is entirely volcanic with moderately steep slopes and with rainfall distribution which is erratic and non-uniform (with the majority of the

precipitation occurring within a few high intensity storms). As a result of these two conditions, the major cause of erosion is due to rainfall impact and water runoffs. The effect of the erosion process in the short-term is to decrease soil fertility, and in the long-term to render the land useless for supporting agricultural crops. An indication of this effect on agricultural lands in St. Kitts is the reduction of yields on upper elevation fields by as much as fifty percent in the last ten years.

Fertile topsoil is being lost in St. Kitts at a high rate (estimated at 300 tons/per acre/per year in some areas). The topsoil loss is due to sheet and rill erosion, where thin layers of soil are removed by each rainfall which is almost indiscernable in the field due to the slow but pervasive process involved. Excessive surface runoff is causing the deepening and widening of ravines bordering cropland. This results in the loss of significant portions of land after each major storm (a gully can cut fifty linear feet into prime agricultural land during a single storm event).

The gully or "ghaut" erosion results from excessive runoff concentrating into larger channels, the increased volume and velocity of the water greatly increases the erosive and sediment-carrying capacity of the stream as it moves down-slope. As the gully bottom deepens, a sudden drop (headcut) develops in the channel. Successive flows cause further deepening and advancing of the headcut upstream. The gullies formed by this process number 100 throughout the island, with 39 of them considered to be major problems.

It has been estimated that if no conservation work is carried out, the cane yields will probably fall another 16% over the next ten years and that thereafter the rooting depth could reduce to such an extent that sugarcane would no longer be economical. The removal of sugarcane, whose root system makes it an excellent crop for soil conservation purposes, accelerates erosion. The small farmer agriculture which replaces the cane does not have an extensive root system, is replanted on a more frequent basis than cane, and risks completely destroying the topsoil. The recommended solution to this problem is the stabilization of the gullies to eliminate undercutting, the terracing of slopes to decrease runoffs, the maintenance of critical areas in vegetable cover and the development of a plan for preventing and treating erosion problems over the long run. These activities are considered investments for the future of agriculture regardless of ownership or cropping choices.

b. Nevis

The Project strategy with regard to agricultural water availability in Nevis is constrained by lack of progress in the CIDA funded exploratory well drilling program. It would be precipitous of AID to begin any major agricultural well drilling program prior to initiation of the CIDA program, however the timeframe for irrigation activities cannot be forestalled until CIDA's program is executed, the results have been analyzed, and an agricultural water program designed.

Water for household use, livestock, agriculture, and light industry is scarce on Nevis, despite an average annual rainfall of about 40

inches. At present, there is keen interest in developing the groundwater resources of the island. This is understandable since only three wells are now supplying the main urban centers. However, the extent, quality, and the safe yield of the groundwater resource is not known. Furthermore, knowledge of the underlying geology is insufficient at this time to allow reliable estimates of the impact that pumping may have on the groundwater/sea water balance. The information needed can only be determined by drilling, coring, pump tests and water quality analysis. The Government has assigned a high priority to these proposed activities and the CIDA program should provide initial results.

An equally high priority is the conservation and development of surface water resources. There are a number of natural springs on the island; some are admittedly underdeveloped, but the potential for the full development of all existing springs will be investigated by the Project. The presence of springs and seeps indicate that there may be other unknown sources of near-surface water that could be developed. The development of this resource will require only modest capital input, and will have minimal effect on the natural water balance of the island, since most sources would be located at elevations considerably above sea level. A simple geological exploration will be necessary to locate possible sources which could then be further explored with horizontal bore holes.

The potential for developing surface water by harvesting rainfall will be investigated. Water harvesting may have the potential of supplying sufficient water for small-scale supplemental irrigation as well as for domestic and livestock needs for rural peoples. For example, a catchment of only about 7 acres (which is sufficient to irrigate about 4.5 acres with 3 feet of water annually) if treated to increase the runoff efficiency to 60 percent, could provide the same amount of water, as an untreated area of 13 acre feet.

Water storage is essential in surface water development whose supplies are ephemeral. The control of seepage and evaporation as well as the design of storage facilities, appropriate to the physical and human resources of the island, will be an important aspect of the Project.

Of additional importance, but of slightly lower priority than the development of water, is the conservation of the soil resource. A major goal of the Project will be the development and/or improvement of appropriate soil and water conservation methods including land treatments and cropping practices in order to improve food production. Of less urgency than the conservation of soil and water on agricultural areas are the conservation and development of the island's watersheds. This work will involve agroforestry, range management, and forestry. Agroforestry may offer opportunities for improving production on lands not suitable for conventional agriculture, but still of a quality adequate to produce moderately quick economic returns. In addition to locating potential agroforestry sites, a major task will be planning for compatible combinations of woody plant species, food crops, and animals (if carefully managed) that will produce the greatest benefits.

## 5. Conformity with St. Kitts-Nevis Development Strategy

The Government's Proposed Project Document which was prepared in 1983 indicates that the main objectives of the St. Kitts-Nevis development strategy are to increase the production of goods for local consumption in order to substitute for imports; to create employment and provide services; to improve the welfare and standard of living of the people; and to reduce substantially the deficit of the balance of payments. These goals are seen to be achievable through improvement and expansion in various agricultural, industrial and service areas.

In the agriculture sector the aim is to increase the yields from sugarcane through improved methods of cultivation and to reach acceptable levels of self-sufficiency in some food supplies through stimulating food production. Currently 70% of the food requirement is imported and the import bill for these items represents 45% of earnings from exports. The Government is fully aware of the serious implications should this trend continue and is introducing measures to rectify the situation. Special attention is being given to the production of vegetables, fruit crops, cotton and oil seed and to the development of livestock and fisheries.

The proposed Project is aimed at improving the agricultural base upon which the diversification efforts will be built. As previously explained soil erosion and an inadequate water supply are serious constraints to increased food crop production. The Project will begin to eliminate these constraints, so that the Government can focus its attentions on encouraging small farmers to increase and improve production of food crops. The Project will directly support the diversification effort by bringing the land up to soil conservation standards and provide access to water which will permit the profitable production of crops other than cane.

## 6. Relationship to Mission Strategy

The Mission fully supports the St. Kitts-Nevis effort to diversify agricultural production and to encourage private sector initiatives in production. The need for action away from sugar is evidenced by the low world market price and the increasing indebtedness of the National Agricultural Corporation (NACO). The need for increased food and livestock production is evidenced by the large import bill for commodities which are readily cultivated in the Caribbean. The Government's goals are consistent with the A.I.D. regional strategy for agriculture which is to increase rural family incomes by upgrading agricultural productivity among small farmers and to increase food production for import substitution and agricultural export. The proposed Project indirectly aims at achieving those goals through preparation of the resource base for utilization for agricultural diversification.

Bilateral ESF assistance to the Government of St. Kitts-Nevis is seen by the Country Team as a fundamental element in our political support for that newly independent nation. The Government is pursuing development policies based largely on free enterprise led growth. This Project is attempting to set the stage for that growth in the agriculture sector. By responding to this development priority, A.I.D. will be underscoring support for democratic policies and free enterprise led growth.

The St. Kitts-Nevis Resource Management Project is essential toward positioning the Mission to pursue the type of policy dialogue called for in the Regional CDSS. Agricultural projects are an important area for dialogue with regional Governments in regard to the need for an increased role for the private sector and a modified role for Government. Through historical circumstances St. Kitts-Nevis stands as an unfortunate example of Government control over the agricultural sector. The proposed Project will make the transition to private sector farming more attractive to private farmers and will provide an opportunity for A.I.D. to request a quid pro quo in that direction.

It is the Mission's policy to attempt to utilize early bilateral projects to accelerate structural change in the agricultural sector in the Eastern Caribbean. The proposed Project will have an early impact as the Government sets about following the recommendations of the various donor funded studies. The Project will, because of the demonstration effects achieved prior to diversification, establish a solid foundation for well conceived soil and water management practices. The implementing agencies will develop correct practices which can be utilized without controversial right-of-way problems. Private farmers can then establish themselves in areas that have been improved rather than having to be displaced after finally receiving land for cultivation.

The Project design has also incorporated AID policy guidelines set forth in the Institutional Development Policy Paper. In order to achieve a viable land planning program for Nevis and soil conservation unit for St. Kitts, the Project includes necessary organizational and policy development activities. Various steps will be taken to develop effective units which will serve the long-term needs of the country.

Finally, the proposed Project reinforces RDO/C's regional agriculture projects by providing further encouragement for private sector farming improvements. The Caribbean Agricultural Research and Development Institute (CARDI) has been actively supporting small farmer development in both St. Kitts and Nevis and welcomes A.I.D.'s efforts to improve the natural resource base and institutions. The 1984/5 theme of the Caribbean Agricultural Extension Project (CAEP) is soil and water management. The support of CAEP in this Project will be particularly useful. It is hoped that as farmer production increases, the Caribbean Agricultural Trading Corporation (CATCO) will be able to link the production effort and the marketing effort for increased revenues to private individuals.

## B. Objectives

The goal of the proposed Project is to improve and preserve the soil and water resources of St. Kitts-Nevis so that a commercial agricultural sector can be sustained.

The Project purpose is to establish appropriate soil and water management practices in demonstration areas on agricultural land and to strengthen the institutional capacity to maintain and extend these management practices.

## C. Project Components

### 1. St. Kitts

The Project will address the soil resource loss of St. Kitts by providing inputs 1) for the evaluation of cultivation methods to conserve soil on moderate to steep sloping lands, 2) for the demonstration treatment at separate sites of three common types of gully erosion, and 3) for the preparation of a Soil Conservation Plan.

The Project will finance: short and long-term technical assistance to manage the implementation of agricultural and civil works and to assist in the preparation of the Soil Conservation Plan; labor, commodities and construction equipment required to complete the works; agricultural equipment and materials for appropriate cultivation and afforestation activities; and training in soil conservation/watershed management and heavy equipment use.

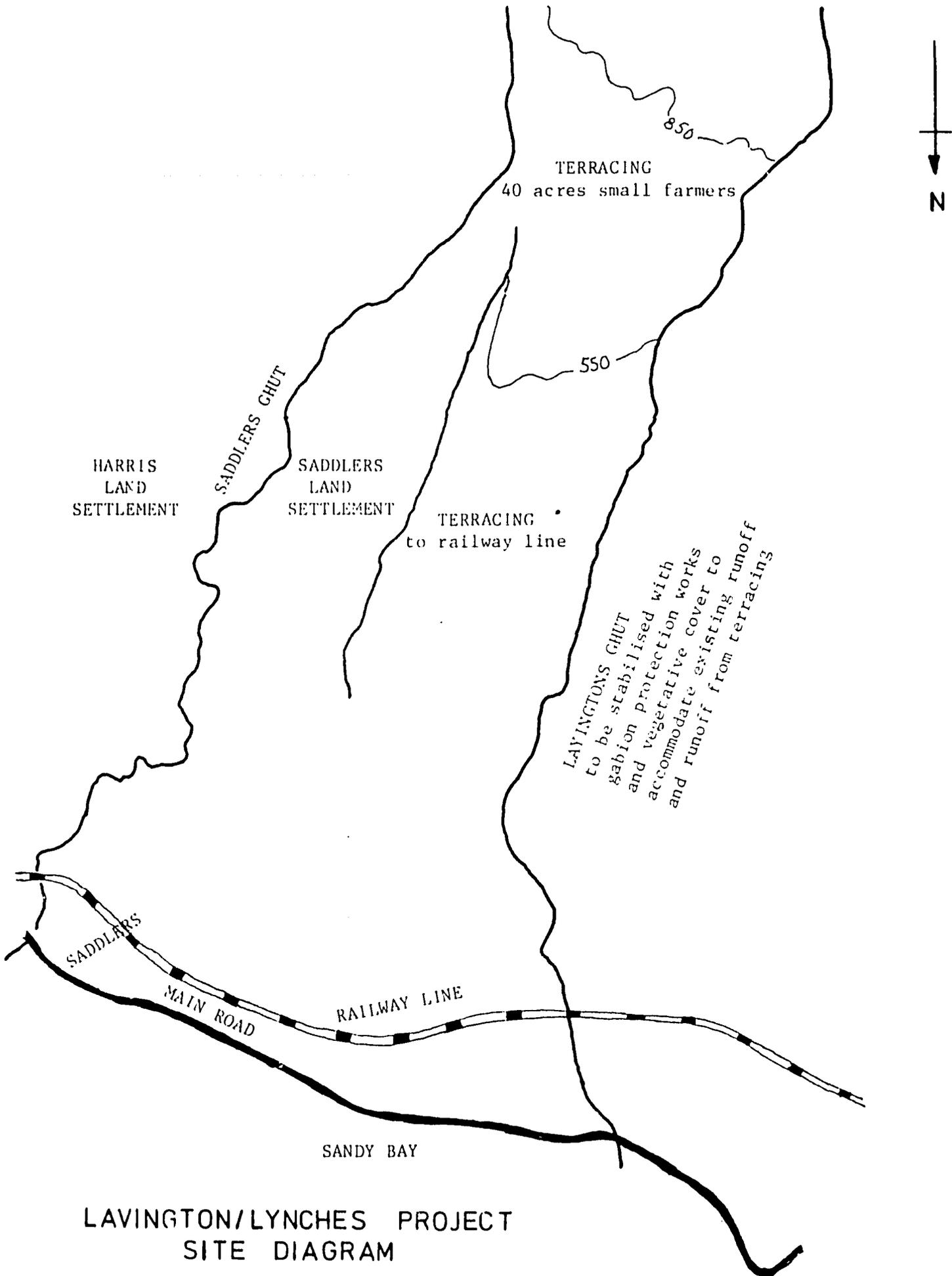
The implementing organizations will be the National Agriculture Corporation, the Public Works Department, the Agriculture Department, the Planning Unit, and regional agricultural and resource management organizations (e.g., CARDI).

#### a. Site Specific Activities

Three areas in St. Kitts were selected as sites for Project activities: Lavington-Lynches, Sir Gillies, and Hope.

i. Lavington/Lynches, an early stage erosion problem was identified as an area for terracing to minimize the loss of topsoil, and for limited civil works to stabilize the gully (See Figure 2 for a sketch of the work to be done at the Lavington Gully). Terracing will be done on a rectangular block of land totaling 135 acres, and bordered by gullies on both sides. Graded terraces will be constructed by NACO. The standard Soil Conservation Service (S.C.S.) method of determining vertical and horizontal spacing of graded terraces is to be used. Based on this method, a rough estimate for the total length of terrace required is approximately 40,000 linear feet. It will be necessary to protect and stabilize the banks and sidewalls of the gully. In some reaches, the sidewalls are vertical and in others, steeply sloping. A buffer strip of trees suitable for agroforestry will be planted under the supervision of the Agriculture Department along the edge of the gully. The strip should consist of 4 or 5 rows of trees and will be located adjacent to the grassed waterways. Seven areas have been identified as being unstable in the gully and require treatment. Gabion structures will be placed at these locations by NACO.

The Project will establish procedures whereby local farmers wishing to occupy this area under long-term leases will be permitted to do so (see Annex H). Small farmers cultivating the gullies and the upper watershed will be offered long-term leases to cultivate approximately 40 acres in the higher elevations of the field which have been marginal for sugarcane production but might be more productive in food crops. The Agriculture Department and CARDI will work with these farmers and supervise the use of the land. This work will address two important aspects of the soil erosion



LAVINGTON/LYNCHES PROJECT  
SITE DIAGRAM

FIGURE 2

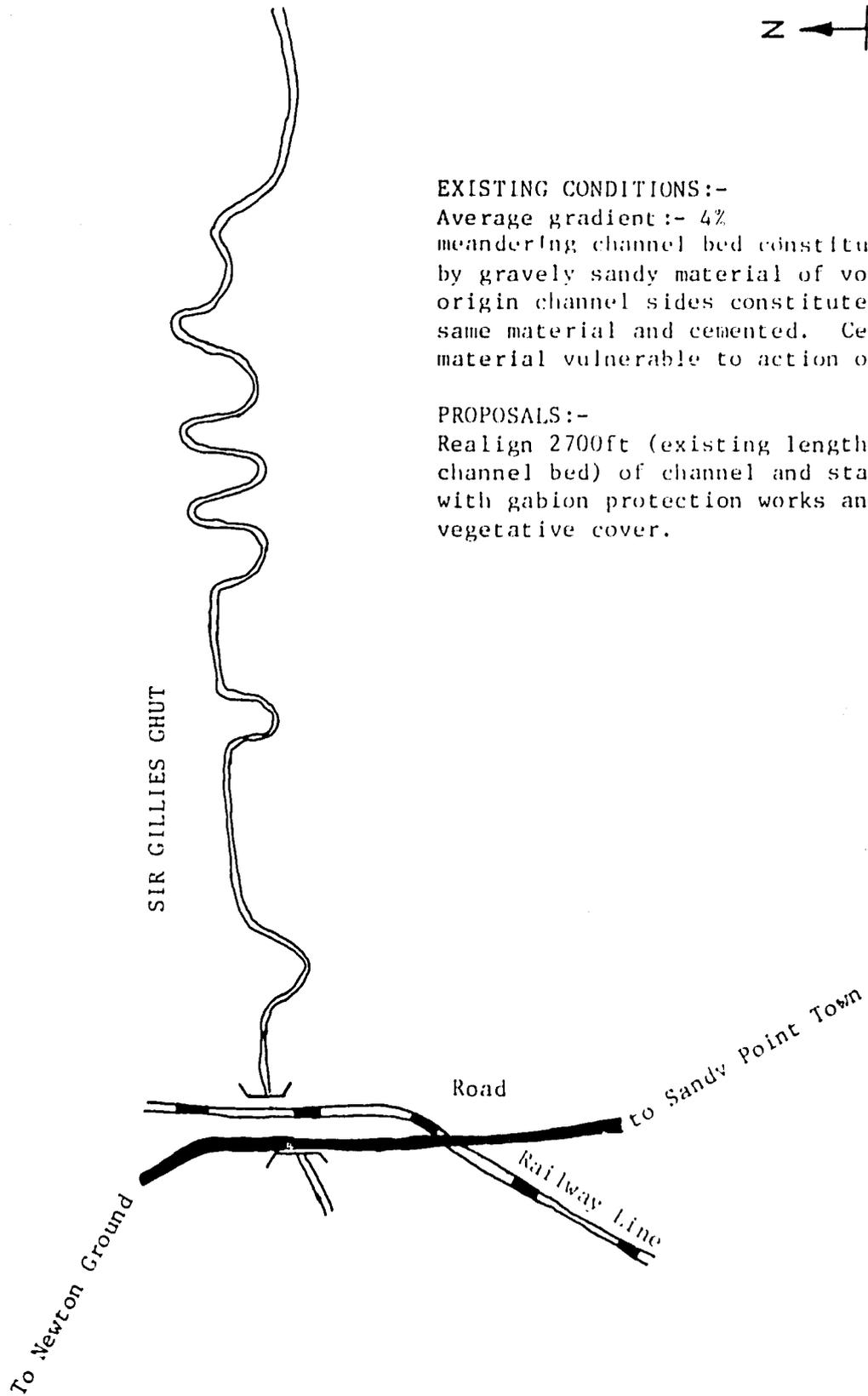
problem, loss of topsoil from the field and degradation of adjacent gullies and upper watershed areas as a result of inappropriate farming practices. It will demonstrate how these erosion problems might be effectively addressed through new farming practices. A secondary but important aspect of this work will be the new knowledge gained in regard to crop diversification, and the improvement of soil and water conservation, cultivation, and agroforestry practices.

The site allocation to small farmers will include demonstration work on a small portion of the field (less than 1 acre) in effective cultivation techniques and evaluation of different methods of crop diversification and agroforestry practices. The Project will provide agricultural production inputs and equipment for field trials and improved varieties of crop and tree seed. Climatic monitoring equipment will be installed and maintained at this site. Information will also be gathered concerning surface runoff and soil loss.

The Agriculture Department and CARDI will provide technical assistance and supervision of Project activities to assist the farmers with crop diversification, agroforestry and soil conservation practices, and will evaluate the effectiveness of these practices in preventing topsoil loss and in increasing agricultural production. The water resources of the upper watershed will be assessed by short-term technical assistance. It is possible that small springs and strata with perched groundwater exist on the steeper slopes of Mount Misery. These water sources might provide a source of irrigation in the future. Also, the potential for water harvesting using treated catchment areas and lined storage reservoirs will be investigated.

ii. Sir Gillies was selected to demonstrate control measures for a flat-bottomed, meandering gully. The work needed is not complex (e.g., construction of gabions and channelization) and should provide a model for civil works control of this type of gully (See Figure 3 for a sketch of work to be done in Sir Gillies Gully). NACO will be responsible for civil works to straighten the meandering path of the gully. The work will consist of constructing a shallow earthen channel to discharge the runoff through a controlled area. Some of the bends will be protected by gabion works. Care will be taken to protect the channel bottom and sides against cutting from increased velocity runoff resulting from channeling. Bulldozer work will be required to build and maintain the channel. On site supervision and training will be provided during the earthmoving operation to insure the bulldozer work is done in an appropriate manner.

A shelter belt area will be established along the sides of the gully as required. This 30 to 40 ft. wide belt will be set aside for permanent tree cover. The upper watershed area will be assessed to determine what action is necessary to protect it from further land clearing, encroachment, and tree cutting for charcoal production. This could involve afforestation of the higher elevations above the gully. This work will be conducted by Project funded labor and supervised by the Agriculture Department.



EXISTING CONDITIONS:-

Average gradient :- 4%  
meandering channel bed constituted by gravely sandy material of volcanic origin channel sides constituted by same material and cemented. Cemented material vulnerable to action of water.

PROPOSALS:-

Realign 2700ft (existing length along channel bed) of channel and stabilize with gabion protection works and vegetative cover.

SIR GILLIES PROJECT  
SITE DIAGRAM

FIGURE 3

iii. Hope, a highly developed, headcut type gully was identified for treatment to provide control of a severe erosion problem threatening the water pipeline to four towns and the only access point to 60 acres of agricultural lands, and to demonstrate procedures to prevent further degradation in this type of gully. The sandy loam soil type of the gully allows severe downcutting and sideslope failures. Contributing to this problem is the continued practice of cutting trees in the gully for charcoal production.

The downcutting of the bed of the gully has reached severe proportions. The old agricultural road crossings have steadily caved in and the road has progressively been located further upstream. At present in an attempt to stabilize the situation, NACO has constructed a twin pipe culvert. However, though some stability has resulted in the immediate vicinity of the culvert the downcutting process has continued to the extent that an 11 ft. drop now exists about 120 ft. from the culvert. If nothing is done, the culvert will be destroyed in a few years time and an entire agricultural area will be cut off. In addition, erosion threatens the sides of the gully near the location of the currently used water main supplying four villages. Further degradation in this area will result in the collapse of the water main.

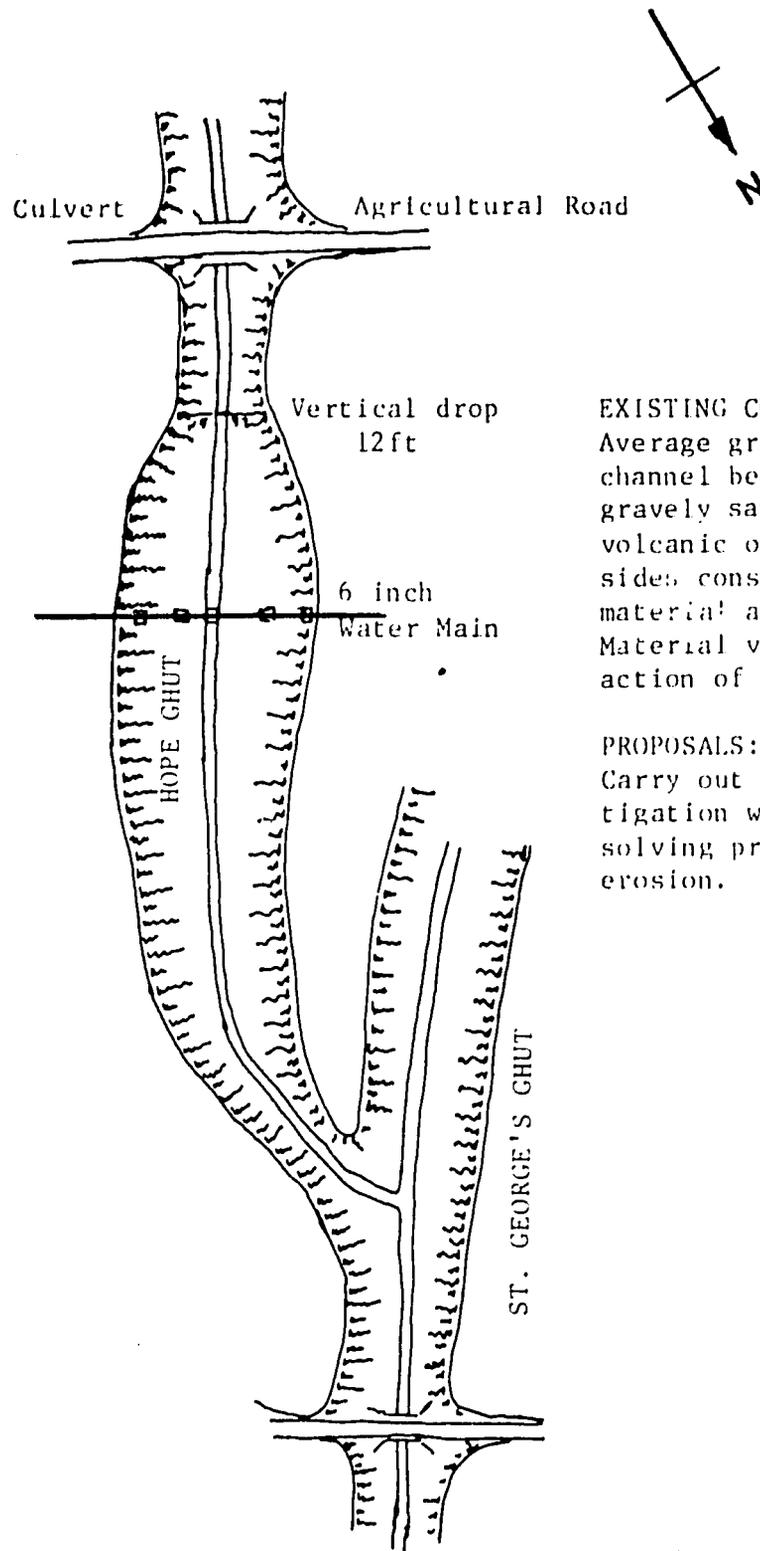
Subject to further analysis and design by project funded technical assistance, the most cost solution has been considered in this design (See Figure 4 for a sketch of the work to potentially be done at the Hope Gully). This would be the construction of a concrete drop structure and an 1,800 ft. concrete channel (less expensive options to this are possible depending on the assessment by short-term technical assistance). The Department of Public Works would be responsible for the concrete work and NACO would be responsible for the construction of gabions in the upper portion of the gully.

The gully banks will be planted in trees on a 40 ft. belt on either side of the gully where required. This work will be conducted by the Agriculture Department.

#### b. Soil Conservation Plan

The Soil Conservation Plan will be drafted by the project manager in coordination with the Department of Agriculture, NACO, and the Planning Unit. The objective of the Plan will be to establish a soil conservation strategy and a work program which will institutionalize an ongoing program to succeed this Project.

The Plan will characterize, locate, and quantify the soil erosion problem in St. Kitts. It will establish criteria for making choices among alternative preventive and remedial activities. It will include a manual, including references, describing technical and cost aspects of these activities including terracing techniques, cultivation and planting techniques, agro-forestry techniques, treatment of incipient gullies, control of land use, and other relevant activities. The Plan will establish a work plan and schedule including definitions of responsibilities and resources to institutionalize a soil conservation program and to replicate the more successful treatment activities of this Project.



EXISTING CONDITIONS:-  
Average gradient = 17%  
channel bed constituted of  
gravely sandy material of  
volcanic origin. Channel  
sides constituted of same  
material and cemented.  
Material vulnerable to  
action of water.

PROPOSALS:-  
Carry out detailed inves-  
tigation with a view to  
solving problem of ghut  
erosion.

HOPE PROJECT  
SITE DIAGRAM

FIGURE 4

## 2. Nevis

The Nevis Project will establish and support a Land Unit within the Nevis Department of Agriculture with the following responsibilities:

- a) To develop and implement a Surface Water Development and Use Plan for the island;
- b) To develop and implement a Watershed Management Plan for the island;
- c) To assist the Government to establish policies and regulations supportive of proper land use and soil and water management; and
- d) To manage Sub-project Activities in support of the watershed management plan and the surface water development plan.

The Surface Water Development and Use Plan will constitute a work program for exploring, monitoring, capturing, storing, and using surface, spring, and perched water. The Plan will concentrate on finding and exploiting water sources near existing and planned farming areas. The preparation of the plan will involve; (a) determining the nature and location of the demand for supplementary irrigation and livestock water, (b) measuring the flow of existing springs and catchments near farming areas, (c) exploring geological formations to locate possible sources of perched water and (d) estimating the potential flow of springs requiring rehabilitation, (e) designing appropriate demonstration devices for capturing, storing, and distributing water and (f) describing and costing a number of sub-projects.

The Watershed Management Plan will build on existing land capability and hydrological studies. It will establish the criteria for determining the nature and level of restrictions and incentives to be placed on land and water use, and it will establish the responsibilities of the owner of the land for proper management of the land. The Plan will identify critical areas where a watershed is in poor condition, where a watershed could be improved to increase significantly the infiltration, and where terraces could increase the capability of the land to support more intensive agriculture. A set of sub-projects will be designed and costed to repair or improve these critical areas.

The policies, regulations, and incentives concerning watershed protection, land use, and disposition of Government estates requires review and improvement. There are a number of policy issues outstanding including the protective zoning of agricultural lands and the relative advantages of leasing versus selling land for agricultural settlement. If is helpful, the Project will mobilize assistance in analyzing these issues. The Unit will monitor the effectiveness of the policies.

The Sub-project resulting activities from the two plans are intended to be effective, but relatively small and inexpensive, demonstration-type interventions which, when taken together and in a context of the Plans, present a demonstration of a comprehensive approach to watershed management and surface water development. Both plans will rank the sub-projects by a criterion of cost effectiveness and need. The implementation

of the plans will involve (a) working out co-financing with landowners where feasible, (b) supervising and construction, and (c) monitoring and improvements after they are put in place.

An illustrative list of the Sub-project Activities includes the following:

- Rehabilitating known wells;
- Building catchment ponds and covered storage tanks;
- Building livestock watering systems;
- Improving existing irrigation systems;
- Controlling incipient ghauts;
- Developing an agroforestry nursery and museum stand;
- Supporting reforestation;
- Improving pastures;
- Improving and/or treating catchment areas to increase runoff.

### III. IMPLEMENTATION PLAN

#### A. Implementation Schedule

All Project activities are scheduled to take place over a period of three years from the date of signing of the Project Agreement. The Project Assistance Completion Date (PACD) is September 30, 1987. An implementation plan for initial activities is presented in Table 1 and separate schedules for the St. Kitts and Nevis components are presented in Figures 5 and 6.

Immediately upon signing the Project Agreement, RDO/C will initiate procurement of a short-term PD&S-funded contractor to work with the Government of St. Kitts-Nevis to: 1) satisfy the Conditions Precedent to Disbursement; 2) draft the RFP for technical assistance; 3) evaluate the bid and proposal responses, 4) prepare for contract negotiations; and 5) coordinate the input of the four Governmental and three regional organizations who will be participating in implementation of Project Activities. The need for this assistance is based upon the Government's recent independence and their lack of experience with USAID bilaterally funded projects. Additionally, St. Kitts-Nevis is located farther from RDO/C than any other country in the portfolio and would require substantial project officer travel time to support initial implementation activities at the level required.

Short-term and long-term technical assistance for the project will be procured from one institution with expertise in agricultural engineering, soil conservation, hydrology, and civil engineering. Due consideration will be given, prior to publication of an advertisement in the Commerce Business Daily, to the availability of 8A firms to perform the tasks required by this team.

The technical assistance team will be led by a long-term advisor who will be resident in St. Kitts and whose primary responsibilities will be supervision of the gully stabilization, field terracing and other project activities being carried out by the Government's Public Work's Department, NACO, and Agricultural Extension Department. Since each of these organizations are presently involved in similar tasks, it is anticipated that the advisor's role in both St. Kitts, and to a lesser extent in Nevis, will be that of coordinator and monitor of AID implementation requirements. In St. Kitts, he will also be responsible for demonstrating model conservation techniques and developing a soil conservation plan which incorporates a strategy for the Government to follow in conservation activities after the completion of the AID project.

There will be a person assigned to Nevis for approximately twelve months during year two of the project. During the first year, the Government with the assistance of the team leader, will secure the appropriate local staff, procure the required equipment and establish the detailed operating procedures for the unit. The long-term advisor's role will be the establishment of the land unit, instruction of staff, and consultant to the Government in matters related to policies governing agricultural land use.

Approximately eight months of short-term technical assistance will be required throughout the project. In St. Kitts, short-term assistance will

be required for the preparation of final design specifications for the gully stabilization and field terracing. In Nevis, the execution of the subproject activities will require technical advice from short-term specialists.

The equipment is an essential element in the implementation of both components of the project. The bulldozer procurement will begin immediately following the signature of the Project Agreement. RDO/C will assist the Government with preparation of the IFB and informal competitive solicitations from the manufacturers of 140 horsepower bulldozers. The vehicles, survey and monitoring equipment procurements must await the arrival of the PD&S funded advisor who will assist with on-site specification preparation.

In-country training will be held jointly for both St. Kitts and Nevis project participants. A course in the proper operation and maintenance of the bulldozer will be conducted by the supplier at the time of equipment arrival. A soil conservation course for project related employees of NACO, PWD, the Ministries of Agriculture and CARDI will be conducted in year three of the project at which time field experience gained during project implementation will be reinforced with classroom training.

Both project components will fund several person months of overseas short-term training in soil conservation and watershed management. The project participants will be sent out mid-way in the life of the project by which time course requirements will be more clearly understood and the participants will have a practical application for the course material.

There are three civil works sites, one terracing site, and three shelterbelt sites. Field terracing will begin in St. Kitts in July 1985 following the preparation of the detailed design by the short-term design team. Civil works will begin in November 1985 following design work and receipt of equipment. Planting of trees in the shelterbelt will commence in July 1986. While some of the the civil works and shelterbelt work will be occurring simultaneously, the majority of activities have been scheduled to succeed one another so that NACO and PWD can utilize as many of their regular staff as possible. Following this sequential approach, conclusion of civil works activities will occur in June 1987.

The soil conservation plan will be prepared by the long-term advisor in cooperation with the Department of Agriculture and NACO. The plan will be prepared beginning in March 1986 and will be completed by the PACD. This time schedule will allow for initiation of project activities and familiarization with the situation by the advisor.

Small farmer selection procedures for the Lavington/Lynches area will be established during the first six months of implementation. Farmer selection will occur during the following six months, but settlement cannot occur until early 1986 when the terracing and drainage of the upper forty acres has been completed.

Project activities in Nevis will commence in April 1985 with the arrival of the bulldozer, the long-term technician, and the unit staff. The advisor and his staff will work jointly to establish a surface water development plan which will be the basis of the initial sub-project activities to begin in August 1985 and will be followed by a watershed management plan and watershed management activities.

TABLE 1

St. Kitts-Nevis Resource Management Project  
Proposed Implementation Schedule

September, 1984	Project Agreement Signed
October, 1984	PIO/T (informal neg.) for short-term management IFB for bulldozers drafted by RDO/C Solicitation of interest for TA firm and bulldozers to CBD
November, 1984	PSC short-term arrives PSC for short-term management signed IFB for bulldozers to manufacturers by Government
December, 1984	CPs to first disbursement satisfied RFP (formal adv.) for all TA drafted RFQ (informal neg.) for vehicles prepared RFQ (informal neg.) for surveying/monitoring equip Host Government Proj. Budget Allocations Approved
January, 1985	RFP for TA sent to interested firms CPs to disbursement for other than professional services met CPs to disbursement for equipment met Contract for bulldozers signed
March, 1985	Evaluate TA firm responses and sign contract
April, 1985	TA arrives - Design work starts - St. Kitts - Land Unit begins in Nevis Vehicles arrive
May, 1985	Bulldozers arrive Bulldozer operator course conducted Surveying equipment arrives
June, 1985	CPs to disbursement in Lavington/Lynches met CPs to disbursement for civil works met Civil Works commodities procurement begins
July, 1985	Terracing begins in Lavington/Lynches CPs to disbursement for sub-project activities met
August, 1985	Sub-projects start on Nevis
November, 1985	Civil Works activities start in St. Kitts
December, 1985	PIO/Ps for short-courses prepared
February, 1986	Mid-term evaluation
March, 1986	Soil Conservation Plan begins
October, 1986	Participants to short-courses
January, 1987	In-country conservation courses conducted
July, 1987	Final Evaluation
September, 1987	PACD



## B. Administrative and Monitoring Arrangements

### 1. A.I.D. Responsibilities

The Agriculture and Rural Development Office (ARDO) of RDO/C will be responsible for managing the project. The agriculture staff currently consists of four USDH agricultural economists and one professional USDH agronomist. A core project committee will be established consisting of one agriculturalist (project officer), and representatives of the Engineering, Capital Projects, and Controller's staff. During the initial implementation stages of this project, the Mission's contract social scientist will also be assigned to this core committee.

The Project Committee will be assisted in contracting and procurement actions by the Regional Contracting Officer; in evaluation matters by the Program Office; in training matters by the Human Resources Development Office; in legal matters by the Regional Legal Advisor; and in environmental matters by the Mission Environmental Officer.

This project has been designed under serious time constraints. A mission project design team worked on-site to gather the information necessary to assure that adequate cost estimates were prepared, that the institutional capability for implementation and maintenance existed, and that the design was consistent with the needs of St. Kitts-Nevis. However, time was not sufficient to prepare final engineering designs nor establish the fundamental knowledge of AID procedures on the part of the host country necessary for expeditious project implementation. These shortcomings have been accounted for in the project design but will require that the original mission design team work hand-in-hand with the Government and the short-term consultants. The engineer and agronomist will be able to guide the short-term design consultants in conforming their task with the designed gully stabilization and field terracing objectives and the social scientist will be able to follow through on the establishment of the small farmer selection committee and assure that the committee's input is included in the terracing design.

### 2. Government of St. Kitts-Nevis Responsibilities

Project implementation in St. Kitts will be the responsibility of the Ministry of Agriculture through the Permanent Secretary. The P.S. will carry out the administrative functions necessary for the technical implementation to be performed by NACO, Public Works, and the Department of Agriculture's Extension Division. The advisors will be supervising the work of these three separate implementing organizations but will report to the P.S. Agriculture.

Implementation in Nevis will also be the responsibility of the Ministry of Agriculture. The Senior Administrative Secretary will be responsible for the administrative functions related to project implementation. The land unit will be established within the Ministry and the advisors will be expected to work under the Minister's guidance.

Both Ministries will be required to familiarize themselves with AID Host Country Contracting Procedures and execute the actions required to

procure technical assistance and commodities under these regulations. They will be assisted in this task by the PD&S funded consultant, the long-term consultants, and RDO/C's Capital Projects Office.

### 3. Cooperating Organizations

Project implementation will necessitate cooperation between several donor and regional organizations. The St. Kitts Public Works Department will be carrying out a major portion of the project's civil works. PWD has operated under the guidance of a BDD-funded advisor for the previous seven years. It is recommended that the advisor's departure does not occur in the middle of this major construction effort. The project team has assured that the Government of St. Kitts-Nevis intends to encourage BDD to continue the Advisor's contract. This is probable since he is also a regional advisor on all BDD engineering projects.

CIDA is currently involved in a major exploratory well drilling project and is planning a follow-on water project scheduled for 1985. The project will seek to coordinate the Nevis component of CIDA water related programs, potential EDF-funded surface water activities and the project's land unit surface water exploratory activities so that information essential to future water resource planning is available to all on a timely basis.

CARDI will play a key role in implementation of the project's farming systems, irrigation, and pasture improvement programs. Efforts in these areas are currently included in CARDI's 1985 work plan which is formulated in conjunction with the Ministries of Agricultural in both St. Kitts and Nevis and will be carried out in conjunction with this project's objectives. CARDI personnel participated in the project design team and have incorporated procedures acceptable to that organization in the design.

#### C. Procurement Plan

##### 1. Commodities

###### a. Bulldozers

It is proposed to purchase two 140 horsepower power-shift tractor bulldozers, one for St. Kitts and one for Nevis. The bulldozer in St. Kitts will be required for work in the ghauts and for terracing. The bulldozer in Nevis will be required for small dam construction, land clearing and soil conservation work. Details of the special requirements with respect to the two bulldozers are given in Annex I. RDO/C will assist the Government to prepare IFB and the notice of its availability for publication in the CBD and the AID-Financed Export Opportunities Bulletin. Responses will be evaluated and a contract awarded by the Government of St. Kitts-Nevis with the assistance of the short-term PD&S funded advisor.

###### b. Vehicles

It is proposed to purchase two four-wheel drive truck cab vehicles, one for St. Kitts and one for Nevis. The vehicles will be used by

the project advisors for transportation to the project sites, hauling surveying equipment, etc. The Ministries of Agriculture in both islands are sorely lacking in transportation for their own staff and cannot support this project's transportation requirements. The procurement will be conducted utilizing host country contracting, informal competitive procedures via an RFQ.

c. Meteorologic and Surveying

Hydrological and rainfall monitoring equipment is needed both to evaluate the effectiveness of the remedial treatments proposed and to help extend information obtained by the conservation units to other problem areas. The implementing agencies also require land surveying equipment for design of field terracing and gully stabilization works, both in this project and subsequently. It is proposed to purchase the following items of hydrologic, meteorologic and basic land surveying equipment:

	<u>St. Kitts</u>	<u>Nevis</u>
Standard Flow Meter -	1	1
Pygmy Flow Meter -	1	1
Water Level Recorders -	3	3
Rainfall Recording Guage -	1	1
Standard Raingauges -	5	5
Transit -	1	1
Tape -	1	1
Range Poles -	2	2
Stadia Rod -	1	1
Soil/Water Testing Equipment	0	1

d. Civil Works Commodities

The procurement of cement and lumber required for the gully stabilization program will be conducted utilizing small value procurement procedures by the procurement division of the Public Works Department. The project advisor and Permanent Secretary of the Ministry of Agriculture will assure that these procedures conform to AID regulations. PWD currently procures from Belize, Puerto Rico, Miami and other locations. Inputs to this project will be required to be of U.S. source.

e. Agricultural Commodities

Planting materials, nursery supplies, tree seeds, potting bags, crop diversification varieties, and fertilizer will be procured for 40 acres of field treatment and 120 acres of afforestation. These inputs will be procured from the United States as required. Procurement will be supervised by the project coordinator in conjunction with the St. Kitts Department of Agriculture's Extension Department.

2. Technical Assistance

a. PD&S Funded Advisor

A Limited Scope Grant Agreement which will provide PD&S funds for a short-term advisor will be signed at the same time this Project

Agreement is signed. The LSGA contains a provision that the Government will sign an RDO/C prepared PIO/T for procurement of a person who is familiar with AID regulations and procedures to assist the Government in fulfilling the Conditions Precedent to Disbursement and in completing the procurement documentation for equipment and technical assistance contracts.

b. Long and short-term advisors

Eight months of short-term and thirty-nine months of long-term technical assistance have been budgeted in the project. Both activities will be procured from a firm with expertise in agricultural engineering, civil engineering, hydrology, soil conservation and watershed management. RDO/C will examine the applicability of 8A firms for this procurement, advertize the availability of this opportunity in the CBD if required, and begin preparation of the Statement of Work to be included in the RFP. The PD&S funded short-term advisor will assist the Government to finalize the RFP, evaluate responses seek AID concurrence at the evaluation and contract negotiation stage and contract for the TA firm. The procurement will be carried out in accordance with AID Handbook 11 procurement procedures for Host Country Contracting.

3. Training

a. In-Country

Instructors for the in-country courses will be obtained as items included under other procurement actions. The bulldozer operator course will be provided as part of the contracting action for the procurement of the bulldozers. The soil conservation and watershed management courses will be conducted by employees of the technical assistance firm and will be included under that contract.

b. Overseas short-courses

It is anticipated that the six short-courses budgeted in the project will be courses conducted by the United States Department of Agriculture. Participants will be selected by the project advisors in consultation with the respective Ministry personnel. PIO/Ps will be prepared by RDO/C's Agriculture Office and processed by the training office.

4. Local Labor

The majority of the work to be carried out under the project will be performed by employees of NACO, the Public Works Department or the Departments of Agriculture. In St. Kitts, the civil works and terracing have been scheduled to be sequential so that Government forces can still carry out their routine assignments. However it is anticipated that an additional work crew of approximately seven laborers will be required on a full time basis to supplement the Government's contribution. In Nevis, contract labor will be required to carry out work under the subprojects. The long-term advisor will be responsible for organizing the selection, payment, and appropriate supervision of these employees.

#### IV. SUMMARIES OF TECHNICAL ANALYSES

##### A. Technical Analysis

##### 1. St. Kitts Design

The problem of soil resource loss on St. Kitts is characterized by excessive surface runoff causing topsoil loss and gully erosion. In the long-term, prevention of excessive runoff is critical to minimizing the damage caused to agricultural land. A short-term and expensive solution to the problem caused by gully erosion is direct treatment to slow the velocity of waterflow or prevent its contact with susceptible areas of the gully bed.

The objective of the Project Team in selecting sites for treatment was to identify two areas in which civil works (e.g. construction of gabions, channelization) could be established to demonstrate effective methods of stabilizing a gully, and another area suitable for topsoil conservation treatments (e.g. terracing and cultivation practices).

Seven gully areas, identified by the Government of St. Kitts-Nevis as high priority areas, were considered for treatment; (a) Sir Gillies, (b) Hope, (c) Wash, (d) Lavington/Lynches, (e) College (f) Cayon, and (g) Saddlers & Harris. The criterion for site selection was based on the need for soil conservation. Consideration was given to the nature of the problem (i.e., the type of gully and the characteristics of erosion in the area), the potential of the site for demonstration purposes, and the threat posed to the public good. A secondary concern was to select one site having an early stage gully adjacent to agricultural land of undisputed title and of marginal quality (higher elevation lands) which could be stabilized by terracing and provide a place for small farmers presently cultivating and damaging the gully and upper watershed areas.

The following is an analysis of the sites selected for activities, with a description of the problem to be addressed and a recommendation for the most technically feasible solution within the funding levels of the Project.

##### a. Topsoil Stabilization - Lavingtons

The field bordering the gully in this area is a 135 acre rectangular block. The upper slopes and areas adjacent to the gully are severely eroded. Productive capacity of the upper slopes has declined sharply in the last 10 years and now produces 50 percent less yield than the island average. Two-thirds of the field is in sugarcane. The remaining land (approximately 25 acres) is in peanut production or is fallowed. The steep slopes above the field are in sweet potato and banana production.

There are three problems; (i) soil erosion on the sloped land in sugarcane production (especially the higher elevation land above the 600 ft. contour), (ii) farmers are cultivating the sideslopes and bottom of the gully with annual crops, and (iii) the upper watershed is being farmed or trees are being cut for charcoal leaving the area subject to severe erosion.

Terraces will be established in order to stop the loss of topsoil from the field. Graded terraces are recommended. Level terraces are expensive, require continuous maintenance, and considerable experience to operate. Furthermore, the instability of the sandy loam soils of the site require that the elevation difference between benches be as low as possible. Leveled terraces on the steep site would require large elevation differences.

With proper terrace construction it is anticipated that the greater percentage of rainfall will be retained on-site, although occasional high intensity storms may produce some excess surface runoff. Waterways will be necessary to conduct this water from the lateral terrace drainages (cuts). Careful attention will be given to protecting the gully areas from excess surface runoff.

It will be necessary to protect and stabilize the banks and sidewalls of the Lavington gully. In some reaches the sidewalls are vertical and in others, steeply sloping. A buffer strip of trees suitable for agroforestry will be planted along the edge of the gully. The strip should consist of 4 or 5 rows of trees and should be located adjacent to the Lavington grassed waterway.

Forty acres of the top portion of the field will be allocated for small farmers. With first priority given to those farmers presently cultivating the gully or the upper watershed. The area will be fenced and each farmer will be offered a lease on a long-term basis for 1 to 2 acres of land. The Agriculture Department will manage the use of these lands and advise the farmers on appropriate cultivation practices. Support will be available to the farmers to diversify the production of annual food crops and to establish fruit tree and agroforestry cultivation. Farmers will be expected to cooperate with the agricultural technicians who in return will provide improved seed types, and planting stock of fruit and wind break trees. Data collected on this experience will be used to replicate crop diversification and improved cultivation techniques in other areas of the island. The long-term objective of this activity is to determine the best cultural practices for soils on upland slopes. This will hopefully provide a model for the Government to follow in their soil conservation efforts in other areas.

b. Gully Stabilization

i. Lavington

The source of this gully is Misery Mountain. The bed of the gully is composed of sandy gravel with some boulder formations at irregular intervals. The sideslopes are formed of the same material and are fairly well vegetated with some trees and tall grass. This is an early stage gully that is relatively stable at present. However, downcutting and head-cutting of the bed and the slipping and sometimes collapse of sideslopes occurs in some unstable reaches of the gully. The gradient of the gully averages 16 percent. Water flow velocities are consequently high. This results in an accelerated cutting action in eroded parts of the gully that are not fully protected by vegetation. Gabion control structures will be required

to decrease the velocity of runoffs in the unprotected areas. A strip of land bordering the gully will be planted in tree crops to stabilize the top section of the gully.

ii. Sir Gillies

The gully in this area originates in the lower slopes of Mount Misery. The bed is relatively flat and stable with sideslopes at steep angles. Waterflows in the gully meander, cutting into the sides causing collapse of the banks. The gradient of the bed averages 5 percent throughout the length of the gully except for higher gradients in a short section of the upper part of the gully.

The bed is on a fairly low gradient which minimizes downcutting but encourages meandering of runoff as it courses through the gully. As the water takes the path of least resistance it cuts into the sideslopes causing landfalls and the loss of valuable agricultural land.

Stabilization of this gully requires that the runoff be channeled through the center of the bed. Bulldozer work will be required to build and maintain an earthen channel. Gabion structures will be built in the channel to control downcutting of the channel itself.

Establishment of a shelter belt area along the sides of the gully will be necessary. This 30 to 40 ft. area will be set aside for permanent tree cover. Also the upper watershed area must be assessed to determine what action is necessary to protect against encroachment from further land clearing and tree cutting for charcoal production. This could involve afforestation of the higher elevations above the gully.

iii. Hope

The gully in this area is a tributary of the St. George's Ghaut, and is located above Tabernacle Village with its source near Verchilids Mountain. The gradient of the gully is steep, 11 to 23 percent in the area selected for treatment. The bottom of the gully is composed of a loose sandy material with a few boulders at irregular intervals. The side slopes are virtually vertical and are composed of the same material as that found in the gully bed. There is no vegetation in the bed but some vegetation including a few trees on the side slopes. Sugarcane and other cultivation extends to the edge of the gully.

The gravelly sandy soil type of the gully allows severe downcutting and sideslope failures. Contributing to this problem is the continued practice of cutting trees in the gully for charcoal production. The downcutting of the bed of the gully has reached severe proportions. The old agricultural road crossings have steadily caved in and the road has progressively been located further upstream. At present in an attempt to stabilize the situation, NACO has constructed a twin pipe culvert and though some stability has resulted in the immediate vicinity the downcutting process has continued. If nothing is done the culvert will be destroyed in a few years time and an entire agricultural area will be isolated. In addition, erosion threatens the sides of the gully near the location of the currently used water main supplying four villages. Further degradation in this area will result in the collapse of the water main.

The average gradient of 17 percent in the gully is too high. The ideal gradient would be 3 percent. However, to modify the gully to this ideal slope would involve constructing 4 ft. falls at 25 ft. intervals for the entire 1700 ft. length and would be an extremely costly solution. An action which should solve the problem and permanently stabilize the gully is to construct a concrete fall or chute at the most serious headcut and a concrete drainage channel the lower length of the gully (an alternative least-cost, viable solution to this work will be assessed in a detailed engineering study of this gully during the early stages of the Project.) A shelter belt of trees will be required in the gully bed on both sides of the concrete channel and on the banks of the gully in the lower and upper areas. Some protection of the upper watershed may be required.

## 2. Equipment Analysis

### a. St. Kitts

The major earthworks on this project will require the use of a bulldozer. There is a considerable amount of rock and earthmoving necessary in the ghauts and project work will utilize the bulldozer for two years to treat 3 ghauts. However, there are five more ghauts which need urgent attention. Furthermore, all the ghauts, about 100 in number, will need repair and maintenance on a continuing basis. The major portion of this work will require the use of a bulldozer (minimum size 140 h.p.). There is only one company (a Government corporation) which leases bulldozers in St. Kitts. They have a D65A Komatsu which is 10 years old and a Caterpillar D-7 which is 13 years old. Neither machine is operating at peak efficiency but regardless, NACO does not have a budget adequate to cover rental costs. NACO is the only organization in St. Kitts involved in soil conservation work and the majority of their heavy equipment is Caterpillar. It is proposed to purchase an angle dozer with flywheel horse power of about 140.

NACO manages and maintains its entire plant and vehicle fleet (216 in number) through its Agricultural Engineering Department, headed by a British-trained Kittitian agricultural engineer. Equipment includes agricultural tractors and track tractors. Maintenance operations are carried out from a central workshop and two area workshops. All workshops appear to have a relatively reasonable range and number of tools to carry-out maintenance operations. Given NACO's mechanical expertise and the tools available, maintenance of a 140 horse power bulldozer should not be a problem. Details of the personnel, plant, vehicle fleet, and tools in the workshops are given in Annex I.

### b. Nevis

Soil and water conservation work will be a major part of this project. A bulldozer will be required throughout the life of the project. The Ministry of Agriculture has a 16 year old D-6 bulldozer which spends 80% of the time in the shop being repaired and is therefore unavailable as required for this project's work. Since hiring from St. Kitts is not practical due to transportation difficulties, it is proposed to purchase an angle dozer with flywheel horse power of about 140.

The Public Works Department maintains and repairs all the Nevis plant and vehicle fleet. Maintenance operations are carried out from a central workshop. The workshop has a reasonable quantity of tools to carry out its work. Any special tools are obtained on loan from St. Kitts. Since the workshop already maintains and repairs some heavy machinery including an Aveling Barford Motor Grader and a Caterpillar D-6 Bulldozer, maintenance of the bulldozer proposed for this project should not pose a problem. Details of workshop personnel and tools in the workshop are given in Annex I.

### 3. Maintenance Capability

All ghaut maintenance work is at present being carried out by NACO. NACO has constructed several gabion protection works in the Cranstowns Ghaut. Conservation and maintenance work includes clearing, channeling and diverting water courses. There is no other organization involved in soil conservation work in St. Kitts. As a result, NACO has accumulated considerable experience in maintaining ghauts especially gabion protection works. NACO's small conservation unit has the knowledge, experience and efficiency to expand to a much larger unit. All concrete work is handed over to the PWD. In recent times PWD has constructed a concrete channel several hundred feet in length, in College Ghaut. Reports indicate that this work is of an acceptable quality.

In Nevis, the Public Works Department maintains domestic surface water systems and the Department of Agriculture maintains agricultural water systems. A similar division of labor exists for the control of gullies. However, there is no soil conservation program but the project, by establishing the Land Unit in the Department of Agriculture is enhancing the present capabilities of the Nevis Administration to maintain existing structures and resource management areas. It is also building the capability to anticipate growing maintenance and take preventive action.

## B. Financial Analysis

### 1. Financial Plan

The total project is estimated to cost \$2.35 million of which AID will contribute \$2.0 million and the Government of St. Kitts-Nevis will contribute \$0.35 million. AID's contribution will be incrementally funded over a two year period, with \$1.0 million provided in FY 84 and the remaining \$1.0 million provided in FY 85. AID's \$2.0 million contribution will be divided between two components: the St. Kitts component will support stabilization of 3 gullies, terracing of 135 acres of agricultural land, and establishment of supporting agricultural practices; the Nevis component will establish a land unit and execute surface water and watershed management sub-projects. Forty percent of the AID contribution will be for civil works and watershed management activities; Twenty-seven percent for short and long-term technical assistance; Twenty percent for commodities; Eight percent for contingency; And five percent for short-term and in-country training.

Three summary tables are provided on the following pages. Table 3 provides project costs by expense category and source of funding while Tables 2 and 6 provide a summary and detailed breakdown, respectively, of

project costs by fiscal year. The fiscal year determination was based upon costs defined as anticipated sub-obligations or commitments of funding through, e.g. PIOs, contracts, purchase orders, or work orders for civil works. Inflation has been included in each line item on the basis of 10 percent per year until the year of obligation.

2. Government of St. Kitts-Nevis Contribution

The financial administration procedures for the Government of St. Kitts-Nevis divide financial responsibilities into unit parts. Funds are budgeted and allocated separately for St. Kitts and Nevis. Within the individual island allocations, the money is subdivided into Ministry budgets and again subdivided into department or corporation budgets. During the project design, it was unclear how AID funds would be advanced and disbursed to the four separate organizations carrying out the work. Therefore, prior to any disbursements under this project, the Government of St. Kitts-Nevis will be required to submit to AID a detailed explanation of the accounting procedures to be used for AID funds.

The Government will be making a significant contribution to the project. Their responsibilities will include: maintenance and operation of all field equipment; provision of adequate staff to carry out the project; provision of new professional staff; office and in-country training facilities; and project administration support. Several department's budgetary allocations will be affected by these requirements. For on-going staff and facilities this is not an issue, however, for new staff and petrol the current estimates are not adequate. The Government's 1985 budgeting process is currently underway with approval expected by December. A September 1984 Project Agreement will permit project requirements to be factored into the budgeting process.

TABLE 2

SUMMARY OF PROJECT COSTS<sup>a/</sup>

BY FISCAL YEAR AND SOURCE OF FUNDING  
(In \$000)

SOURCE OF FUNDING	1984	1985	TOTAL
A.I.D.	1,000	1,000	2,000
Government of St. Kitts-Nevis	-	350	350
TOTAL	1,000	1,350	2,350

<sup>a/</sup> A.I.D. dollar Grant Project costs are defined as anticipated sub-obligations or commitments of funding through, e.g., PIOs, contracts, or purchase orders.

TABLE 3  
SUMMARY OF COMBINED ST. KITTS-NEVIS PROJECT COSTS  
BY EXPENSE CATEGORY AND SOURCE OF FUNDING<sup>a/</sup>  
(In \$000)

Expense Category <sup>b/</sup>	Life of Project Funding				
	A.I.D. Grant			GOSKnc/	TOTAL
	FX	LC	TOTAL		
<b>1. <u>Technical Assistance</u></b>					
a. Long-Term	500	-	500	25	525
b. Short-Term	-	50	50	15	65
Sub-Total	500	50	550	40	590
<b>2. <u>Training</u></b>					
a. Short-Term	48	6	54	15	69
b. In-Country	31	5	36	25	61
Sub-Total	79	11	90	40	130
<b>3. <u>Commodities</u></b>					
a. Field Equipment	300	-	300	120	420
b. Vehicle	30	-	30	10	40
c. Agricultural	50	6	56	35	91
d. Surveying & Monitoring	20	-	20	15	35
Sub-Total	400	6	406	180	586
<b>4. <u>Other Costs</u></b>					
a. Civil Works	269	200	469	54	523
b. Field Terracing	-	125	125	9	134
c. Shelter Belt	-	60	60	6	66
d. Sub Project Activ.	20	130	150	-	150
Sub-Total	289	515	804	69	873
<b>TOTAL</b>	<b>1268</b>	<b>582</b>	<b>1850</b>	<b>329</b>	<b>2179</b>
<b>CONTINGENCY (8%)</b>	<b>100</b>	<b>50</b>	<b>150</b>	<b>21</b>	<b>171</b>
<b>GRAND TOTAL</b>	<b>1368</b>	<b>632</b>	<b>2,000</b>	<b>350</b>	<b>2350</b>

a/ Project Costs are defined as anticipated sub-obligations or commitments of funding through, e.g., PIOs, contracts, purchase orders, or work orders for civil works.

b/ Inflation =10 percent

c/ Government In-Kind Contribution = Salaries of permanent local staff; maintenance, fuel and operation of field equipment; office space, meeting and training rooms; etc.

TABLE 4  
SUMMARY OF AID FUNDING  
BY FISCAL YEAR AND SOURCE OF FUNDING<sup>a/</sup>  
(In \$000)

Expense Category <sup>b/</sup>	Fiscal Year					
	1984		1985		TOTAL	
	FX	LC	FX	LC	FX	LC
<b>1. Technical Assistance</b>						
a. Long-Term	500	-	-	-	500	-
b. Short-Term	-	50	-	-	-	50
Sub-Total	500	50	-	-	500	50
<b>2. Training</b>						
a. U.S. Short-Term	20	-	28	6	48	6
b. In-Country	-	-	31	5	31	5
Sub-Total	20	-	59	11	79	11
<b>3. Commodities</b>						
a. Field Equipment	300	-	-	-	300	-
b. Vehicle	30	-	-	-	30	-
c. Agricultural	-	-	50	6	50	6
d. Surveying & Monitoring	20	-	-	-	20	6
Sub-Total	350	-	50	6	400	6
<b>4. Other Costs</b>						
a. Civil Works	-	-	269	200	269	200
b. Field Terracing	-	80	-	45	-	125
c. Shelter Belt	-	-	-	60	-	60
d. Sub Project Activ.	-	-	20	130	20	130
Sub-Total	-	80	289	435	289	515
TOTAL	870	130	398	452	1268	582
CONTINGENCY	-	-	100	50	100	50
GRAND TOTAL	870	130	498	502	1368	632

<sup>a/</sup> Project Costs are defined as anticipated sub-obligations or commitments of funding through, e.g., PIOs, contracts, purchase orders, or work orders for civil works.

<sup>b/</sup> Inflation = 10%

<sup>c/</sup> Government In-Kind Contribution = Salaries of permanent local staff; maintenance, fuel and operation of field equipment; office space, meeting and training rooms; etc.

## C. Economic Analysis

### 1. Background

The economic analysis of this project departs from the normal project analysis. Time constraints have precluded more than a cursory examination of some variables affecting each project component. That a complete economic analysis be done at this stage is not critical, however, given the implementation plan for the project. Of the five components of this project, only one will go forward without further, more substantive review, and that component is sufficiently sound in economic terms.

The following discussion first presents some important conceptual issues that bear on project feasibility and then describes the analysis that the longer lead-time for project components will permit. The discussion continues with a preliminary analysis of project components; this provides data that give an initial indication of which components may prove difficult to justify on purely economic grounds. The final, concluding section draws together the preceding discussion and, employing the data estimated for project components, comments on the merit of the project as a whole.

### 2. Important Conceptual Issues

As the project rationale states, the design team examined options in soil conservation and water management, and selected three soil conservation activities in St Kitts and two less-defined water management activities in Nevis. The Nevis components include yet unspecified subproject activities. The project goal is to improve soil and water management "...so that a commercial agricultural sector can be sustained." Clearly, a necessary condition for success of the project is the viability of the agricultural use of the improved resource base.

Indications are that currently the sugar sector in St Kitts is not commercially viable. This is the case despite the fact that sugar represents 25% of the GDP, 45% of exports and 26% of employment. In addition, problems of land ownership and tenure are such that lands currently in sugar will not be diversified in the near future. To anticipate the analytical results below, if one takes as binding the constraints that lands will stay in sugar and that current production techniques will continue, any assessment of the Sir Gillies and Hope Ghaut components of this project will probably produce unfavorable results. Indeed, the only way to obtain favorable results is to consider alternative uses of the land. Two agricultural alternatives exist: (a) improving the efficiency of cane production, and (b) turning the land to other agricultural uses.

It is difficult to quantify the relative merits of alternative land use in the short time available for preparation of this project paper. A long-term donor-funded study of the sugar sector in St Kitts is nearing completion and will provide a comparison between the alternatives of current production techniques and more efficient ones. Studies are available already that compare the use of land in sugar with its use in non-sugar agriculture. Soon, these three supply-side alternatives may be compared objectively, although impression is that diversification will prove most efficient and current sugar techniques least so.

While these conclusions will be an important input to a sound economic analysis of components of this project, the demand side must also be considered. For sugar, guaranteed markets currently exist. For other crops, there is not such certainty--either for import substitution or for export--nor can marketing studies predict perfectly. As a result, although a given project component that converts land to diversified production on 50 or 100 acres may be economically viable in isolation, one would not be able to conclude that larger scale application would be assured of success.

### 3. Requisite Analysis

As has been indicated, severe time constraints and the heterogeneity of this agriculture project in St. Kitts-Nevis have precluded carrying out an ideal economic analysis of the project. Still, an indicative economic analysis of the project's components can be and is presented in the following pages. First, however, it is instructive to describe how an ideal analysis of those elements still open to consideration should be conducted.

The umbrella project consists of five generally unconnected components. As such, each component should be examined separately. In each case, two situations should be compared: one is the situation over a 15 or 20 year period if the component is not done, and the other is the situation over that period if it is done. In each situation, all costs of production and all outputs should be quantified, on a year-by-year basis. In the absence of the project component (be it water management or soil conservation), one may presume that the differential between costs and output value will narrow over time, as the resource base is depleted. Under this project, the resource base will be preserved to some extent, but at a cost. The central question is whether the benefits associated with preserving the resource base warrant the associated costs.

Up to this point, the described analysis is a financial rather than an economic analysis. From the standpoint of an individual or a firm, the comparison described above would help determine whether or not a proposed project was financially viable although it does not ignore the risk factor. If, from this financial standpoint, the project were viable, a donor or a government should seriously consider not doing the project; to do the project might be to unnecessarily subsidize legitimate private sector activity.

If a given project component is not financially viable, it still may be appropriate for a government to find funds to carry out the project. A decision to do so would depend upon the economic, as opposed to financial, merit of the project. An ideal economic analysis would differ from the financial analysis of a project component in two fundamental ways. First, prices used to value the costs and benefits (output) of the project would reflect economic scarcities rather than actual market values. (For example, in areas of high unemployment, the economic price-or opportunity cost--of labor may be significantly lower than the actual wage). Second, certain elements typically external to a financial analysis might be included in an economic analysis, on both the cost and the benefit side, where appropriate. (For example, if a project that upgrades the resource base on one plot of land leads to the hastened deterioration of an adjacent piece of land this externality represents an additional economic--though not necessarily financial--cost of the project.

At the same time, focus should be directed to demand-side and marketing questions and to the question of alternative uses of the land. Although this will certainly complicate the analysis, we believe answers to these questions will be critical to realizing the demonstration potential of project components. And these answers are certainly essential to the land use-related objectives of the project as a whole.

#### 4. Illustrative Analyses of Components

The following cost-benefit analyses are preliminary attempts to assess the value of proposed project components. The design of the three St Kitts components is straightforward, but the two Nevis components still need to be detailed (and will be prior to obligation of funds).

##### a. Surface Water Development, Nevis

This component, like the Nevis watershed component, consists of developing a number of subprojects, which have yet to be designed. Consequently, quantitative analysis can at best be illustrative of the general viability of the development of surface water resources. Table 5 provides a rough guess of the relationship between costs and benefits that may emerge as subprojects are designed over the coming three years.

Under the theoretical scenario presented in Table 5 the \$120,000 earmarked for subprojects in this project component is used to construct small ponds with a total capacity of 120 acre-feet. It is estimated that these ponds will permit the growing season on 40 2-acre existing vegetable farms to double, from the current 50 days to 100 days.

Costs of the subprojects are several. First, the costs of building the ponds, plus technical assistance and commodities are all paid for by project funds. Second, we estimate that farmers will have to pay an average of \$2250 per acre to develop irrigation systems to make use of the ponds. Third, we estimate that the opportunity cost of labor is \$10 per man-day, a cost to be applied to the incremental man-days of labor expended under the lengthened growing season.

Benefits we measure as the returns to the incremental production. Using sample disaggregation of costs and outputs for a variety of vegetable farms in Nevis, we estimate the average gross return to labor to be \$25 per man-day.

TABLE 5

SURFACE WATER MANAGEMENT, NEVIS

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Years 4-15</u>
<u>Costs</u>	169.2	216.8	178.0	40.0
Subprojects <u>1/</u>	40	50	40	0
Technical Assistance <u>2/</u>	43.7	43.8	-0-	0
Commodities	30.5	30.5	30.5	0
Opportunity Cost of Labor <u>3/</u>	10.0	25.0	40.0	40.0
Irrigation Tie-In <u>4/</u>	45.0	67.5	67.5	0
<u>Benefits</u> <u>5/</u>	25.0	62.5	100.0	100

Notes

- 1/ Costs of building small ponds
- 2/ Technical assistance for subproject work
- 3/ See text; 50 person-days X 40 farms X 2 acres/farm X \$10/person-day
- 4/ Estimated costs of tying-in to ponds
- 5/ See text; 50 additional person-days X 40 farms X 2 acres/farm X \$25/man-day

b. Watershed Management, Nevis

The development of a watershed plan and the development of a small number of sub-projects to improve the watershed are expected to yield three types of benefits: directly productive agroforestry activities; increased infiltration of water to the aquifer; and prevention of the degradation of soils and the water retention capability of the slopes. For purposes of this theoretical analysis, assume two demonstration subprojects on abandoned land: planting six acres of fruit trees and planting twenty acres of tree species adapted to dry conditions to be utilized for fence posts and charcoal production. At maturity, 8 years after planting, the six acres of fruit trees can be expected to return \$9600 per year. The direct establishment costs will be \$13,500, \$900, \$1050, and \$1200 in years 1 through 4. Each of the twenty acres of forest trees will yield, from year 8, six tons of charcoal valued at \$82 per ton and thirty fence posts valued at \$15 each, all after costs of production. The direct cost of establishing these trees will be \$13,450. Overhead cost of one fourth of the technical assistance costs will be charged against these two subprojects. Table 6 provides a comparison of the benefits and costs, which yield an internal rate of return of about 6 percent.

TABLE 6

BENEFITS AND COST OF WATERSHED MANAGEMENT, NEVIS

<u>Item/Year</u>	1	2	3	4	8-15
<u>Benefits</u>					
Fruit tree income	0.0	0.0	0.0	0.0	9.6
Forest tree income	0.0	0.0	0.0	0.0	19.2
<u>Costs</u>					
Subprojects	17.9	5.3	5.6	1.2	0.0
Technical assistance	21.9	21.9	0.0	0.0	0.0

c. Lavington-Lynches Improvements, St. Kitts

In the Lavington-Lynches area graded terraces will be built on a 135 acre rectangle field to carry surplus run-off gently off the land at non-erosive velocities into a reinforced gully where it can be safely discharged. Small farmers cultivating the gullies and the upper watershed will be allowed long-term leases to cultivate approximately 40 acres in the higher elevations of the fields and NACO will continue to cultivate sugar cane in the lower 95 acres. Agroforestry will be established above the field and on the slope of Lavington gully.

Assume the same rainfed farm productivity here as was assumed for Nevis, i.e., cropping regimes which require 50 person days per acre, per year with a return of \$25 per person day. Assume also that there are 17 households farming one half acre each above the field and in the gullies and that they move their operations to 2 acres of the upper field. As in the Nevis watershed management component, let us assume that 6 acres of fruit trees are planted along the gullies and 20 acres of forest trees are planted above the field.

Table 7 presents the elements of the cost-benefit analysis. Direct costs of the project include \$108,700 for management, \$125,000 for terracing, \$67,600 for gully improvement, \$33,600 for vehicle and tractor costs, \$21,100 for short-term technical assistance, and \$30,000 for tree planting. In addition to these direct costs are those associated with the labor component of vegetable production. In Table 5, it was assumed that the opportunity cost of a man-day of labor was \$10; in the case of the Lavington-Lynches component, an opportunity cost of \$2--or one-fifth of the other--is assumed. The gullies are the most marginal farmland and one may safely assume that the opportunity cost of farmers working that land is probably close to zero.

Benefits of this component are of two types. First, the product of the 17 new 2-acre farms is a benefit, although not completely incremental, since these farmers have already been farming one-half acre in the gullies. Second, the output of the agroforestry activity is a benefit and the calculation is similar to that in Table 5.

As calculated in Table 7, the component produces an internal rate of return of about 8 percent. In fact, the more careful investigation that is precluded by time constraints would demonstrate an even higher rate of return. The labor inputs to the actual terracing and other direct project work are not assessed at shadow wage rates. Were they so calculated, project costs would be reduced while benefits would not be affected. In the benefit calculations for the vegetable farms, output is assessed at local prices; to the extent that the goods are tradable, they would be valued at import prices, which will probably exceed local prices. A revaluation would probably raise the benefits.

TABLE 7

LAVINGTON-LYNCHES TERRACING, ST. KITTS

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>8-15</u>
<u>Costs</u>	191.7	158.0	45.3	3.7	3.4
Management	36.2	36.2	36.3	0	0
Terracing	62.5	62.5	0	0	0
Gully Improvement	33.8	33.8	0	0	0
Heavy Equipment	16.8	16.8	0	0	0
Short-term Technical Assistance	21.1	0	0	0	0
Opportunity Cost of Labor <u>1/</u>	3.4	3.4	3.4	3.4	3.4
Tree Planting	17.9	5.3	5.6	0.3	0
<u>Benefits</u>	31.9	31.9	31.9	31.9	60.7
Vegetable Farms <u>2/</u>	31.9	31.9	31.9	31.9	31.9
Agroforestry <u>3/</u>	0	0	0	0	28.8

Notes

1/ See text; 17 farms X 2 acres/farm X 50 person-days X \$2/person-day

2/ See text; 17 farms X 1.5 additional acres/farm X 50 person-day X \$25/person-day

3/ As in second Nevis component.

d. Sir Gillies and Hope Ghaut Improvements

The two remaining components of the project are ghaut improvements at Sir Gillies and Hope. Generally speaking, benefits of these two projects are difficult to measure because the financial returns to sugar land have been decreasing and were negative in 1982. The major benefit from these two components is preservation of sugar land, but a more thorough economic analysis should be carried out to assess the economic--as opposed to financial--value of the production on the relevant acreage.

The Sir Gillies component preserves eight acres of cane land and saves the cost of relocating one farm, all at a cost over

\$200,000. To obtain an internal rate of return of 10 percent, the annual per acre economic value of cane land would have to be over \$2,000. This compares with the 1982 \$234 financial loss for an acre of cane.

The Hope Ghaut component will preserve 60 acres of cane land at a cost of over \$700,000. A cane land evaluation of over \$1,200 would be required to return 10 percent per year on the project.

## 5. Conclusions

It is clear from the foregoing that some components of this project, as presently designed are difficult to justify on economic grounds. These are the Sir Gillies and Hope Ghaut components. Prior to obligation of funds, a technical and economic re-evaluation will be undertaken. In the case of Lavington-Lynches, on the other hand, diversified use of the land was designed into the component, and the analysis suggests the project will yield positive returns. For the two Nevis components, subprojects are no more than conjectural and thus neither analysis is on solid footing. An economic analysis will be completed before funds are obligated and disbursements made for these components. However, the analysis suggests that some form of non-cane agriculture subprojects would improve chances of economic viability.

The economic analyses strongly support those elements in the conditions precedent to disbursement that require further, in-depth analysis prior to disbursement of funds. However, an important RDO/C goal in St Kitts-Nevis is to assist the government to develop a viable approach to agriculture. The approach that has been adopted to meet this goal is to undertake activities which are priorities of the government and to assist them in analyzing the technical and economic pros and cons of these activities prior to proceeding.

This project should be viewed as providing an opportunity to conduct policy dialogue in agriculture while at the same time presenting a vehicle for implementation of sound proposals. St Kitts-Nevis has high unemployment, has an agriculture sector that while unproductive still provides the majority of current jobs, and has probably limited scope for rapid tourism expansion. Land on Nevis lies largely fallow and is devoted to pasture land, currently apparently also uneconomical. The search for viable agricultural solutions will clearly take time.

Given the magnitude of the problems, the importance of supporting a friendly nation in developing viable solutions, and the necessity that such solutions not be hastily implemented, this project as designed has economic merit.

## D. Administrative Analysis

### 1. St. Kitts

#### a. Organization

Because the project entails the involvement of a number of agencies; The National Agricultural Corporation, the Department of Agriculture, and the Public Works Department, implementation will necessitate utilizing the Ministry of Agriculture as the chief implementing agency.

(See Annex K). This makes administrative sense because the Ministry of Agriculture has overriding financial and administrative responsibility for all of NACO's divisions and the Department of Agriculture, as well as responsibility for developing working relations with CARDI. Sub-contracting for Public Works also occurs on a frequent basis, and Public Works maintains Ministry vehicles and plants. Overall responsibility for administering the Project will be with the Permanent Secretary.

b. Management

An evaluation of the present management and organization of the various agencies indicates that there are some institutional weaknesses which impede their effectiveness. Firstly, as a newly independent state, St. Kitts has had little experience in administering donor projects. The public sector lacks expertise in this regard. Secondly, there are numerous professional vacancies. In the Department of Agriculture there are vacancies in Agriculture Extension and Forestry. The NACO Agricultural Engineering Section has suffered from vacancies in Soil Conservation. However, the Government has agreed to appoint two soil conservationists by the time this Project begins. The Public Works Department, on the other hand, appears to be adequately staffed and managed.

The matter of inexperience in implementing donor projects is being addressed by short-term technical assistance supplied by AID under a Limited Scope Grant Agreement. Both long-term technical assistance in the person of the project manager and short-term expertise in selected areas are designed to strengthen the in-house capabilities of NACO and the Department of Agriculture. The forestry vacancies, however, remain to be addressed.

Counterparts will gain experience in project design and management while working with the Project Manager and other experts on the various sub-project activities and in developing a Soil Conservation plan for St. Kitts.

c. Staffing

Staffing problems exist with varying degrees of seriousness among the agencies associated with the Project. Public Works appears to suffer least from turnover rates. The Department of Agriculture, while understaffed, also appears to have a stable work force. NACO's Agricultural Engineering division and Soil Conservation Unit have an experienced team of laborers. However, one team is not adequate, given the needs of this project, to carry out both normal maintenance and project activities. Hence, the Government has been requested to hire additional labor for the duration of this project, and particularly to assure that there is labor available during crop.

d. Financial Status

Overall budgeting responsibility for the several agencies associated with this project lie with the Ministry. This is the case for NACO and the Department of Agriculture. Thus disbursement will be expedited by utilizing the Ministry, and particularly the Permanent Secretary who is the chief administrator for all agencies and programs associated with agriculture

and land development. Sub-contracting occurs frequently with Public Works and this project will involve transactions with which Ministry officials are currently unfamiliar.

## 2. Nevis

### a. Organization

The implementing agency for this component of the Project is the Ministry of Agriculture, Lands and Tourism. This is necessary as budget and administration in Nevis are separate from that in St. Kitts. The Nevis component of the project involves actual institution building of the Ministry.

### b. Management

The Ministry of Agriculture in Nevis is basically an institution in formation. Although there are no professional vacancies in the Ministry and staffing appears adequate given the small size of the island, the establishment of a Land Unit will entail considerable technical assistance. Institution building is an important component in this section of the project. As in St. Kitts, AID is also funding needed technical assistance in the area of project management, so that by the time actual project activities commence expertise will have been developed. The smallness of Nevis is an asset in terms of overall administration as there is close collaboration and good working relations among professional personnel.

### c. Staffing

In order to implement the activities associated with this component of the project, the Government of Nevis is committed to hiring two agriculturalists to staff the Land Unit, one of whom will function as a counterpart to the project manager. These two persons will be drawn from recent successful CXC candidates in Agriculture. Hence, although they are eligible for degree training in Agriculture, they will not be qualified professionals, and they will be in need of further training in both agriculture and management. The Government of Nevis is cognizant of this fact.

### d. Financial Status

Although St. Kitts and Nevis comprise one country, in fact there are separate jurisdictions with respect to administrative and financial matters. Administration, disbursement and accounting functions are performed through the Premier's Office in Nevis.

## E. Social Soundness Analysis

### 1. St. Kitts

Summarization of the results of the Social Soundness Analysis which is contained in Annex J demonstrates that the Project can be deemed socially sound based on the following criteria:

a. Socio-cultural Acceptability

Both the larger population and the Government are aware of the serious problems of soil erosion and the long-term prospects for increasing loss of topsoil and land if the problem is not remedied. The erosion control aspect of the project is comprised of some activities already in existence in St. Kitts, activities which are of a high priority, but for which the government lacks sufficient funding, technical skill and machinery. Although erosion control activities have been institutionalized within NACO, the Agricultural Engineering Unit saw the need for technical assistance and further training in various aspects of soil conservation.

The plantation system is in decline in St. Kitts. Rationalization of both sugar and non-sugar lands must occur and the government of St. Kitts is cognizant of this. There is also "land hunger" in St. Kitts. Both farmers and part-time estate workers are anxious to acquire arable land. Thus, the small farmer sub-project provides a way to address a critical need in St. Kitts, access to arable land on long-term lease. The project is also occurring in an area where, some diversification has already taken place. In fact, project land lies contiguous to acreage which is presently cultivated by small farmers and which is being considered for another donor project. The possibility of collaboration or the expansion of the project at a later date thus exists.

The project presents the opportunity, not only to provide farmers with arable land but also to intensify soil conservation and resource management efforts on these and adjacent lands as well as at two other sites on the island.

b. Soil Consequences and Benefit Incidence

i. Ghaut Stabilization and Soil Conservation

Stabilization of the three ghauts will be of benefit to residents and farmers of land adjacent to the ghaut. In the case of Hope Ghaut, residents of nearby Tabernacle will retain access to their fields located above the ghauts, the main source of livelihood for many. Civil works on Hope also will alleviate the danger to a water pipeline which serves much of the northeast.

In addition to immediate remedial efforts, the major benefit to be derived from this section of the project is in the transfer of soil conservation, agro-engineering and watershed management techniques. The source of the problem does not lie in the ghauts themselves, but in land practices and assessment of alternative land use policies. Thus residents, farmers, and Ministry personnel will obviously benefit from implementation and maintenance of sound resource management practices.

ii. Small Farmer Sub-Project

Resettlement of small farmers from the ghaut and upper slopes of Lavington-Lynches should not incur social tension as these lands are not deemed of high value, but are farmed primarily because of their availability. Selection of farmers for this project will be done in a egalitarian manner and through utilization of criteria which are impartial.

The committee composed for this purpose will be comprised of individuals highly respected in the community and professionally qualified to oversee the sub-project.

Socially positive effects will benefit those farmers given access to arable land. Not only will they be given the opportunity to farm more productive land but they will benefit from learning soil conservation techniques and new cultivation practices. In turn, productive cultivation should economically benefit the villages from which farmers are drawn.

c. Demonstration Effect and Diffusion

Much of the project should result in a spread effect in both components. Hopefully, the knowledge gained in the areas of soil conservation, civil works, watershed management and agricultural engineering can be applied by Ministry staff throughout the island and become institutionalized with positive long-term benefits.

The involvement of Agricultural Extension, CARDI and other Department of Agricultural professionals in the small farmer component which includes the collection and analysis of data, will ensure that the impact of this project will be beyond the Lavington-Lynches area.

2. Nevis

Summation of the results of the Social Soundness Analysis for Nevis (See Annex J) indicates that the Project meets the following criteria:

a. Socio-cultural Acceptability

The establishment of a Land Unit and the implementation of several sub-project activities have been listed by the Government of Nevis as high priority. These activities are not only seen as useful in and of themselves, but as leading to the ultimate disposal of estate lands for productive purposes and settlement of small farmers.

b. Social Consequences and Benefits

Both short and long-term benefits are to be derived from institutionalizing a Land Unit in Nevis. Not only will aspects of the Project aid in the development of land and watershed policy and planning, but the specific sub-project activities will provide transfer of some skills, training and technical assistance in important resource management areas.

Those farmers selected for site activities will also benefit. However, it is important, as in St. Kitts, to establish criteria for selection that is socially acceptable to the residents of Nevis. It is also important to ascertain that project activities will in the near future become readily available to the larger small farming community.

c. Spread Effect

Implementation of the policies developed by the Land Unit will have major ramifications for land use and resource management in Nevis, once they are accepted by the Government.

The training and technical assistance given to Ministry personnel should insure diffusion throughout the island once these components are institutionalized into the programs of the Ministry of Agriculture.

As profitable enterprises result from using new techniques. Soil conservation and water measures should be readily accepted and introduced by the larger community.

F. Environmental

The approved Initial Environmental Examination (IEE) recommended a Negative Determination. The project consists of conservation and rehabilitation activities rather than new construction. No long-term negative environmental impact will be attributable to the limited construction work under this project.

The conservation work will be carried out in accordance with the following environmental considerations:

(1) Ghaut stabilization work will reduce the severe erosion within the ghauts;

(2) Water conservation work will reduce erosion potential and will use normal flow patterns.

(3) Terracing work will reduce unacceptable erosion of utilization areas and will use normal flow patterns.

(4) Work will be carried out using existing Government sources for stone aggregate and boulders in accordance with sound environmental practices.

V. CONDITIONS PRECEDENT AND COVENANTS

The following conditions and covenants will be included in the Loan/Grant Project Agreement:

A. Conditions Precedent to Disbursement

1. First Disbursement. Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An opinion of counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Grantee, and that it constitutes a valid and legally binding obligation of the Grantee in accordance with all of its terms;

(b) A statement of the name of the person holding or acting in the office of the Grantee specified in Section 8.2., and of any additional representatives, together with a specimen signature of each person specified in such statement; and

(c) Evidence that the Grantee has established an accounting system for the project which is in conformity with generally accepted accounting principles applied on a consistent basis.

2. Disbursement for Other Than Professional Services. Prior to any disbursement or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made for other than professional services, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A time-phased implementation plan for all project activities including: a schedule for procurement of equipment, supplies, construction services, training, and technical assistance; a schedule for civil works design and construction, field terracing, and agricultural extension in St. Christopher; and a schedule for plan development and sub-project execution in Nevis; and

(b) Evidence of the designation of project coordinators who will be responsible for the day-to-day implementation of project activities for both the St. Kitts and Nevis components of the project.

3. Disbursement for Civil Works In St. Kitts. Prior to any disbursement or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made for any particular civil works activity under the project (including construction materials related to civil works), the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A detailed engineering design, cost estimate, construction schedule, management plan and economic feasibility analysis for the particular activity;

(b) Evidence that land use policy in the project site areas allows for the provision of an adequate buffer zone for tree plantations at the edges of gullies and in the upper watershed where required; and

(c) Evidence that the vacant position of soil conservationist within the National Agricultural Corporation's (NACO) Agricultural Engineering Department has been filled.

4. Disbursement for Sub-Project Activities in Nevis. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for sub-project activities, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A detailed sub-project description including technical design specifications, cost estimates, implementation plan, and economic feasibility analysis; and

(b) Evidence that a Nevis land unit has been established and staffed with adequate office space and provision for financing the unit's day-to-day operations.

5. Disbursement for Lavington/Lynches Project Element. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for the work to be performed in the Lavington-Lynches Area, the Grantee will, except as the Parties may otherwise agree in writing, furnish A.I.D. in form and substance satisfactory to A.I.D., a settlement plan for the Estate, including but not limited to a system for providing long-term land tenure security for farmers on farm plots on the Lavington/Lynches Estate, a system for selecting the farmers for settlement on the land, and a scheme of providing the farmers with necessary production assistance.

6. Disbursement for Equipment Procurement. Prior to any disbursements or the issuance by A.I.D. of documentation pursuant to which disbursement will be made for equipment procurement, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) A list of proposed equipment, detailed specifications, cost estimates, and a maintenance plan; and

(b) Evidence that adequate staff has been provided to carry-out the objectives of this project as specified in Section B.3.

## B. Special Covenants

1. Agricultural Development Policies. The Grantee covenants to review its land use, soil conservation, and land tenure policies for the islands of St. Christopher and Nevis taking into consideration the results and

recommendations of the technical assistance provided under this project and to review these and related areas important to the development of agriculture with AID periodically during the life of the project.

2. Equipment Utilization. The Grantee covenants to utilize equipment provided under this project for activities similar in nature to those carried out under this project for a period equalling the useful life of the equipment.

3. Personnel. The Grantee covenants to provide such personnel as are necessary to assure the effective implementation of the project. This will include a soil conservationist/agricultural engineer, work crews, an agricultural extension agent and an equipment operator in St. Christopher and two agriculturalists and an equipment operator in Nevis.

4. Project Evaluation. The Parties agree to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include during the implementation of the Project and at one or more points thereafter:

(a) Evaluation of progress toward attainment of the objectives of the Project;

(b) Identification and evaluation of problem areas or constraints which may inhibit such attainment;

(c) Assessment of how such information may be used to help overcome such problems; and

(d) Evaluation, to the degree feasible, of the overall development impact of the Project.

## VI. EVALUATION ARRANGEMENTS

Two project evaluations will be conducted. The first, which will be a progress evaluation, will take place approximately 18 months after commencement of activities. This evaluation will be conducted by in-house resources and will examine the progress being made in relation to the implementation plan as it relates to the achievement of project objectives. In particular the continuing validity of project rationale and strategy will be assessed; constraints to effective implementation of the two components will be identified, and recommendations made to facilitate achievement of objectives within the remaining project timeframe.

A final evaluation will be conducted in July 1987, prior to the PACD. Funding of this evaluation will be taken from residual project funds or the PD & S account. The focus of the evaluation will be on; (1) the extent to which activities occurring under the project have been documented and carried out in such a way as to permit replicability, (2) the adequacy of the St. Kitts Soil Conservation Plan for continuing work started under this project, (3) the adequacy of the Nevis Surface Water and Watershed Management Plan for guiding the activities of the Nevis Land Unit, (4) the technical and administrative capability of the Nevis Land Unit to effectively provide service to the agricultural community, and (5) progress made by the Government in offering farmers long-term leases and providing them the resources for crop diversification.



FAIR AND OPEN OPPORTUNITY FOR ALL QUALIFIED PURCHASERS, AND (C) UNITS ARE AN OPTIMUM SIZE GIVEN CROP OPTICS.

3. PROJECT ECONOMIC ANALYSIS. IN ADDITION TO THE DIRECT BENEFITS ASSOCIATED WITH INCREASING THE LONG-TERM PRODUCTIVITY OF THE LANDS TO BE IMPROVED, THE ECONOMIC ANALYSIS SHOULD INCLUDE ANY INDIRECT BENEFITS SUCH AS REDUCED SEDIMENT LOAD CARRIED DOWNSTREAM. THE ANALYSIS SHOULD CONSIDER THE "WITH PROJECT" SCENARIOS OF BOTH CONTINUATION OF THE EXISTING CROP ACTIVITY AND CULTIVATION OF THE HIGHEST VALUE CROP ALTERNATIVE WHICH IS LOCALLY KNOWN AND FEASIBLE. FOR SOME LANDS CURRENTLY IN SUGARCANE, THERE MAY BE NO OTHER CROP OPTION WITHIN THE SCOPE OF THIS PROJECT. WHERE LAND IMPROVEMENTS ALLOW FARMERS TO CHANGE CROPS, ANY ADDITIONAL COSTS OF THE DIVERSIFICATION MUST BE INCORPORATED INTO THE ANALYSIS. IN SOME CASES, IT MAY BE MOST REASONABLE TO ASSUME THAT NEW CROPS WILL BE PHASED IN OVER THE LIFE OF THE PROJECT.

4. MAINTENANCE AND TRAINING. EROSION CONTROL THROUGH THE INSTALLATION OF PHYSICAL BARRIERS IS THE PRIMARY THRUST OF THE PROJECT. GIVEN THIS FACT, THERE IS A NEED TO TRAIN FARMERS AND GOSAN AGRICULTURAL STAFF TO MAINTAIN THESE STRUCTURES. THE MISSION SHOULD ALSO SEEK A GOSAN COVENANT TO LEVISE AN ACCEPTABLE PLAN FOR ONGOING MAINTENANCE OF THE STRUCTURES TO BE FINANCED UNDER THE PROJECT.

ALSO, THERE IS A BROADER NEED FOR TRAINING IN PROPER CULTIVATION AND CONSERVATION TECHNIQUES IN ORDER TO MAINTAIN THE LONG-TERM BENEFITS OF THE PROJECT. AS PART

OF THE PP, IF POSSIBLE, THE MISSION SHOULD DEVELOP A PLAN FOR TRAINING FARMERS, SOIL CONSERVATION WORKERS AND GOSAN STAFF, AND SEEK A NACO COMMITMENT TO FILL ITS CURRENTLY VACANT SOIL CONSERVATION POSITION PRIOR TO BEGINNING PROJECT IMPLEMENTATION.

5. PROJECT DESIGN. BECAUSE AFFORESTATION AND SOIL AND RESOURCE CONSERVATION ARE PRIMARY PURPOSES OF THE PROJECT, THE LAC CHIEF ENVIRONMENTAL OFFICER HAS ARRANGED THROUGH THE FORESTRY SUPPORT PROGRAM (FSP) FOR A FORESTER/WATERSHED MANAGEMENT EXPERT TO PARTICIPATE ON THE PROJECT DESIGN TEAM. THE FSP HAS IDENTIFIED JOHN THAMES AS AN AVAILABLE QUALIFIED CANDIDATE AND HAS OBTAINED MISSION CONCURRENCE PER FSP-RDO/C TELCON ON 8-28. PLANS ARE FOR THAMES TO ARRIVE 9-4 OR 9-5 AND STAY THROUGH 9-14. THE FSP WILL FUND THE TECHNICAL ASSISTANCE AND RELATED TRAVEL COSTS.

6. USE OF PRIVATE CONTRACTORS VERSUS FORCE ACCOUNT. FOR THE INSTALLATION OF INFRASTRUCTURE, THE MISSION SHOULD

BT

#4901

CONSIDER THE COST EFFECTIVENESS OF CONTRACTING THE WORK AS AN ALTERNATIVE TO BUYING EQUIPMENT AND DOING THE WORK THROUGH THE MINISTRY OF AGRICULTURE.

7. FUNDING. WHILE FUNDING OPTIONS HAVE NOT YET BEEN FINALIZED, IAC AND PPC ARE ACTIVELY SEEKING ESF MONEY AND WILL ADVISE THE MISSION WHEN THERE IS SOMETHING DEFINITE.

8. PD-71 DETERMINATION. BECAUSE THIS IS A LAND CONSERVATION PROJECT AND DOES NOT DIRECTLY INVOLVE SUGAR PRODUCTION, MARKETING, OR PROCESSING, PD-71 WILL NOT APPLY. IN ADDITION, THE INDIRECT PRODUCTION EFFECTS ARE EXPECTED TO BE MARGINAL AND WILL NOT HAVE ANY SIGNIFICANT EFFECT ON THE US MARKET. HOWEVER, THE MISSION SHOULD INCLUDE AN ANALYSIS IN THE PROJECT PAPER CONFIRMING THESE POINTS.

9. THE LAC CHIEF ENVIRONMENTAL OFFICER APPROVED IEE-84-51 FOR THE PROJECT ON AUGUST 31. A COPY IS BEING SENT BY POUCH. SHULTZ

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#4951

UNCLASSIFIED

ACTION AID INFO AME DCM CHRON

ANNEX B  
Page 1 of 1

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TO RUEHVA/AMEMBASSY FRIDGETOWN IMMEDIATE 6682  
INFO RUEHCNCA/AMEMBASSY ANTIGUA PRIORITY 4279  
BT  
UNCLAS STATE 276273

10 1001

ADM AID

I.O. 12056: N/A

TAGS:

SUBJECT: AUTHORITY TO EXECUTE A.I.D. ASSISTANCE AGREEMENTS  
IN ST. KITTS/NEVIS

REF: FRIDGETOWN 6108

AUTHORIZATION SIGNED MONDAY, SEPTEMBER 17, 1984 BY A.I.D.  
ADMINISTRATOR MCPHERSON FOR NEGOTIATION, CONCLUSION, AND  
TERMINATION OF A.I.D. ASSISTANCE AGREEMENTS IN ST. KITTS  
NEVIS IN ADVANCE OF PROPOSED BILATERAL AGREEMENTS. COPY  
OF SIGNED ACTION MEMORANDUM BEING POUNDED TO RLC/G. SHULTZ  
BT  
#6273

UNCLASSIFIED

ACTION	INFO
STATE 276273	
<i>RLA</i>	
DIR	<input checked="" type="checkbox"/>
D/DIR	<input checked="" type="checkbox"/>
MGT	<input checked="" type="checkbox"/>
RLA	
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DUE: 09/19/84	
TAKEN:	
SIGN:	

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PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects under the FAA and project criteria applicable to individual funding sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP-TO-DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriation Act  
Sec. 523; FAA Sec. 634A;  
Sec. 653(b).
  - (a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; Congressional Notification was sent forward and expires on September 25, 1984.
  - (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)? Yes.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? Yes
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? No action required
4. FAA Sec. 611(b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land Yes

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resource construction,  
has project met the  
standards and criteria as  
set forth in the  
Principles and Standards  
for Planning Water and  
Related Land Resources,  
dated October 25, 1973?

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? Yes
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. No.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) To the extent that the project is successful in fostering small commercial farms, it will support a b. c, d, and e

strengthen free labor unions.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). The project will utilize a U S. institution for technical assistance and will procure U.S. commodities.
9. FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. The Government will be utilizing an in-kind contribution for its support to project services.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes.
12. FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the Assistance not for such production.

resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

13. FAA 118(c) and (d).  
Does the project take into account the impact on the environment and natural resources? If the project or program will significantly affect the global commons or the U.S. environment, has an environmental impact statement been prepared? If the project or program will significantly affect the environment of a foreign country, has an environmental assessment been prepared? Does the project or program take into consideration the problem of the destruction of tropical forests?

Yes.

not applicable.

a negative determination has been approved.

not applicable

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)?

not applicable

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria  
a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by

not applicable

extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses,

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and small incomes of the poor)?

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

g. FAA Sec. 281 (b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective

participation in  
governmental processes  
essential to  
self-government.

2. Development Assistance Project not applicable  
Criteria (loans Only)

a. FAA Sec. 122(b).  
Information and  
conclusion on capacity of  
the country to repay the  
loan, at a reasonable  
rate of interest.

b. FAA Sec. 620(d). If  
assistance is for any  
productive enterprise  
which will compete with  
U.S. enterprises, is  
there an agreement by the  
recipient country to  
prevent export to the  
U.S. of more than 20% of  
the enterprise's annual  
production during the  
life of the loan?

c. ISDCA of 1981, Sec. 724  
(c) and (d). If for  
Nicaragua, does the loan  
agreement require that  
the funds be used to the  
maximum extent possible  
for the private sector?  
Does the project provide  
for monitoring under FAA  
Sec. 624(g)?

3. Project Criteria Solely for  
Economic Support Fund

a. FAA Sec. 531(a). Will  
this assistance promote  
economic or political  
stability? To the extent  
possible, does it reflect  
the policy directions of  
FAA Section 102? Yes  
Yes

b. FAA Sec. 531(c). Will  
assistance under this  
chapter be used for  
military, or paramilitary  
activities? No

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c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

No

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

Not applicable

ST. KITTS-NEVIS  
COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1984 Continuing Resolution.

No

Has it been determined or certified to the Congress by the President that the government recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in Section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to United States Government personnel or their dependents, or from entering the U.S. unlawfully?

2. FAA Sec. 620 (c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government?

No

3. FAA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

No

4. FAA Sec. 532(c), 620(a), 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513  
Is recipient country a communist country?

No, No, No.

Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?

6/2

-2-

5. ISDCA of 1981 Secs. 724, 727 and 730. Not applicable  
For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.
6. FAA Sec 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property? No
7. FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC? No
8. FAA Sec. 620 (o); Fishermen's Protective Act of 1967, as amended, Sec. 5 No  
(a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?  
(b) If so, has any deduction required by the Fishermen's Protective Act been made? Not applicable
9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any AID loan to the country? a. No  
(b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds? b. No
10. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resource which the country has spent on military equipment? (Reference may be made to the annual "Taking into Consideration" memo: Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.) Not applicable
11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? No  
If so, have they been resumed and have new

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- bilateral assistance agreements been negotiated and entered into since such resumption? Not applicable
12. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? (Reference may be made to the Taking into Consideration memo.) Available information indicates no arrearage
13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime? No
14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA. No
15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No, No.
16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Session of the General Assembly of the U.N. of September 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.) Taking into consideration Memo does not prescribe assistance to St. Kitts-Nevis

b2

17. ISDCA of 1981 Sec. 721. See Special requirements for assistance to Haiti. Not applicable

18. FY 1984 Continuing Resolution. No  
Has the recipient country been determined by the President to have engaged in a consistent pattern of the opposition to the foreign policy of the United States?

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? No  
Not applicable

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest? No  
Not applicable

b. ISDCA of 1981, Sec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Government of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.? Not applicable

c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Government of Chile has made significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier? Not applicable

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5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the Agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed. Yes
2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S except as otherwise determined by the President or under delegation from him? Yes
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed? Yes
4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? Not applicable
5. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? Yes
6. FAA Sec. 603(a). Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percentum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. Yes
7. FAA Sec 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, Not applicable

not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available? Yes
9. FY 79 App. Act. Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States? Yes

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest? Construction is small amount of project and will be handled by the host country.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million? Not applicable

C. Other Restrictions

1. FAA Sec. 122(e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? Not applicable
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? Not applicable
3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the U.S.? Not applicable
4. FAA-Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S., or guaranty of such transaction? Yes

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5. Will arrangements preclude use of financing?
- a. FAA Sec. 104(f). To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization? Yes
  - b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property? Yes
  - c. FAA Sec. 660. To finance police training or other law enforcement assistance, except for narcotics programs? Yes
  - d. FAA Sec. 662. For CIA activities? Yes
  - e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S., unless a waiver is obtained? Yes
  - f. FY 1982 Appropriation Act, Sec. 503. To pay pensions, annuities, retirement pay, or adjust service compensation for military personnel? Yes
  - g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments, arrearages or dues? Yes
  - h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending? Yes
  - i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields? Yes
  - j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the Government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? No
  - k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress? Yes

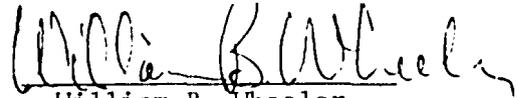
12

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE  
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, William B. Wheeler, as Director of the Agency for International Development, Regional Development Office/Caribbean having taken into account, among other things, the maintenance and utilization of projects in the Caribbean Region previously financed or assisted by the United States, do hereby certify that in my judgement the Government of St. Christopher and Nevis has both the financial capacity and the human resources capability to effectively utilize and maintain goods and services procured under the proposed Grant Project entitled St. Kitts-Nevis Natural Resource Conservation Project.

This judgement is based upon the implementing record of externally financed projects, including AID-financed projects, in St. Christopher and Nevis, the commitments from the Government of St. Christopher and Nevis and the quality of the planning which has gone into this new Project.

(Signed)



William B. Wheeler  
Director

(Date)

9/28/81



**PRIME MINISTER  
ST. KITTS AND NEVIS**

Ref. No. PM/A7/1.....

GOVERNMENT HEADQUARTERS,  
P. O. BOX 186,  
ST. KITTS, W. I.

21st September, 1984.

His Excellency,  
Mr. Tom H. Anderson, Jr.,  
Ambassador,  
United States of America,  
c/o American Embassy,  
P.O. Box 302,  
Bridgetown,  
BARBADOS.

Dear Mr. Ambassador:

The purpose of this letter is to request a grant from the United States of America in the amount of \$2.0 million to assist the Government of Saint Christopher and Nevis to accomplish the St. Kitts and Nevis Resource Management Project. The protection, conservation and enhancement of our land and water resources is a fundamental part of my Government's overall National Development Plan, and an essential activity to sustaining a productive and diversified agricultural sector in both islands of the State.

The design of the Resource Management Project was accomplished jointly by officials of my Government's Ministry of Agriculture, Lands, Housing and Development, and the National Agricultural Corporation (NACO) in collaboration with technical officers of USAID. The Project consists of soil erosion control in St. Kitts and water and land management in Nevis. In each island, these activities are priority development investments in the agricultural and rural sectors.

The soil erosion programme on St. Kitts consists of both gully stabilization and field terracing. The programme in Nevis is designed to assist Nevis to establish a cost effective surface water and land management capability.

The St. Kitts soil erosion component is estimated to cost \$1.33 million and the Nevis water and land use programme is estimated to cost \$0.66 million. The Government of Saint Christopher and Nevis requests that the United States provide \$2.0 million of this financing while we provide the remaining \$0.35 million through a contribution of staff, facilities, and recurrent maintenance costs.

The Government of Saint Christopher and Nevis assures the United States  
/Government

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**PRIME MINISTER  
ST. KITTS AND NEVIS**

GOVERNMENT HEADQUARTERS,  
P. O. BOX 186,  
ST. KITTS, W. I.

*Ref. No* .....

- 2 -

His Excellency  
Mr. Tom H. Anderson, Jr.  
U. S. Ambassador,  
BARBADOS.

21st September, 1984.

Government of its full cooperation in carrying out the St. Kitts and Nevis Resource Management Project. The manpower, financial and other inputs required of us will be provided in an expeditious manner.

We look forward to a continued, combined effort by both Governments to yield a productive and beneficial programme for the people of Saint Christopher and Nevis.

Please accept assurances of my highest consideration.

A handwritten signature in cursive script that reads "Michael O. Powell".

Michael O. Powell  
Prime Minister (Acting)

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project  
From FY 84 to FY 87  
Total U.S. Funding \$2.0  
Date Prepared: 9/26/84

Project Title & Number: St. Kitts-Nevis Resource Management Project

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																																
<p><b>Program or Sector Goal:</b> The broader objective to which this project contributes:</p> <p>To improve and to preserve the soil and water resources of St. Kitts-Nevis so that a commercial agricultural sector can be sustained.</p>	<p><b>Measures of Goal Achievement:</b></p> <p>Increased production in the agriculture sector.</p>	<p>Annual statistical data of Government of St. Kitts-Nevis.</p>	<p><b>Assumptions for achieving goal targets:</b></p> <p>Access to land and water are among the most serious constraints to growth of the non-sugar commercial agricultural sector</p>																																																
<p><b>Project Purpose:</b></p> <p>To establish appropriate soil and water management practices in demonstration areas on agricultural land, and to strengthen the institutional capacity to maintain these management practices.</p>	<p><b>Conditions that will indicate purpose has been achieved: End of project status.</b></p> <p>Decrease in loss of topsoil and land.</p> <p>Increase in water availability to farms</p> <p>Adoption of techniques demonstrated in Project</p>	<p>Field monitoring devices installed and monitored by Project.</p> <p>Survey during Project Evaluation</p>	<p><b>Assumptions for achieving purpose:</b></p> <p>Government of St. Kitts-Nevis commitment to conservation/management practices.</p>																																																
<p><b>Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Stabilization of gullies.</li> <li>2. Terracing of fields.</li> <li>3. Location of small farmers on land.</li> <li>4. Increased soil conservation capabilities of Government.</li> <li>5. Establishment of land unit.</li> <li>6. Increase in supply of water.</li> <li>7. Soil Conservation Plan.</li> </ol>	<p><b>Magnitude of Outputs:</b></p> <ol style="list-style-type: none"> <li>1. Three Gullies Stabilized.</li> <li>2. 135 Acres of field terraced.</li> <li>3. 40 acres of field under small farmer cultivation.</li> <li>4. Fully staffed &amp; trained soil conservation unit in NACO.</li> <li>5. Fully staffed &amp; trained land unit in Nevis.</li> <li>6. Additional sources of water supply identified, and expanded.</li> <li>7. Plan for additional conservation work developed.</li> </ol>	<p>Project Evaluation.</p>	<p><b>Assumptions for achieving outputs:</b></p> <p>Farmers will be permitted access to fields on non-political basis and will be offered long-term leases. Necessary local staff provided.</p>																																																
<p><b>Inputs:</b></p> <table border="0" style="width: 100%;"> <tr> <td></td> <td style="text-align: center;"><u>A.I.D.</u></td> <td style="text-align: center;"><u>G.St.Kitts-Nevis</u></td> <td style="text-align: center;"><u>Total</u></td> </tr> <tr> <td>Technical Assistance</td> <td style="text-align: center;">550</td> <td style="text-align: center;">40</td> <td style="text-align: center;">590</td> </tr> <tr> <td>Training</td> <td style="text-align: center;">90</td> <td style="text-align: center;">40</td> <td style="text-align: center;">130</td> </tr> <tr> <td>Commodities</td> <td style="text-align: center;">406</td> <td style="text-align: center;">180</td> <td style="text-align: center;">586</td> </tr> <tr> <td>Other</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    Civil Works</td> <td style="text-align: center;">804</td> <td style="text-align: center;">69</td> <td style="text-align: center;">873</td> </tr> <tr> <td>    Terracing</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    Shelterbelt</td> <td></td> <td></td> <td></td> </tr> <tr> <td>    Sub-Projects</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Contingency</td> <td style="text-align: center;">150</td> <td style="text-align: center;">21</td> <td style="text-align: center;">171</td> </tr> <tr> <td></td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> <td style="text-align: center;">—</td> </tr> <tr> <td style="text-align: right;"><b>TOTAL</b></td> <td style="text-align: center;">2,000</td> <td style="text-align: center;">350</td> <td style="text-align: center;">2,350</td> </tr> </table>		<u>A.I.D.</u>	<u>G.St.Kitts-Nevis</u>	<u>Total</u>	Technical Assistance	550	40	590	Training	90	40	130	Commodities	406	180	586	Other				Civil Works	804	69	873	Terracing				Shelterbelt				Sub-Projects				Contingency	150	21	171		—	—	—	<b>TOTAL</b>	2,000	350	2,350	<p><b>Implementation Target (Type and Quantity)</b></p>	<p>USAID disbursement records, Ministry of Agriculture records, St. Kitts and Nevis separately.</p>	<p><b>Assumptions for providing inputs:</b></p>
	<u>A.I.D.</u>	<u>G.St.Kitts-Nevis</u>	<u>Total</u>																																																
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Per State 264901, the IAC Chief Environmental Officer approved IEE-84-51 for the project on August 31.

Sub-Project Implementation of Small Farmer Scheme

One component of this Project is the implementation of conservation practices at Lavington-Lynches small farmer sites on 40 acres of land. Considerable planning of this section of the Project has already occurred by the Team Social Scientist, Country Team Leader of CARDI - St. Kitts, Research Officer of the Department of Agriculture, Manager of the Agronomy Research Unit of NACO and Agricultural Extension Officers. The recommended structure is as follows:

Purpose and Goal

To introduce conservation techniques and farming practices to enhance land use and conservation among approximately 20 small farmers who reside in the Saddler's Village - Parsons area contiguous to Lavington-Lynches estate and who farm the hillsides, ghauts and lands of Lavington-Lynches estate.

Stipulations

Farmers will be leased approximately 2 acres of land at the prevailing lease rate of EC\$30/acre. While presently NACO administers the leasing of land, it is NACO's desire to give up that responsibility and turn it over to the Department of Agriculture wherein lies responsibility for small farmer development. Leases must be long-term at least 20 years, with the leasees given the first option to buy should Government take the decision to release the land to private ownership.

Criteria of Small Farmers

Strict criteria for the selection of small farmers must be established and adhered to in order for the Project to be beneficial on both an equitable basis and to provide individuals who would be the best asset to the success of meeting the Project goals. Criteria must include the following:

- a. Those farmers occupying land and planting crops on the slopes of Lavington ghaut;
- b. Those farmers occupying land and planting crops on highland areas to be reforested;
- c. Farmers in the area who have demonstrated a commitment to full-time farming;
- d. Farmers who are recognized by the Committee as farmers willing to practice innovative techniques; and
- e. Farmers who are willing to commit themselves to the long-term lease, abide by the contract, and actively participate in the Project's activities on their allocated site.

### Administration of Sub-Project

The Lavington component of the Project will be administered in the following manner. A Technical Assistant and Sub-Project Committee will be formed comprised of the following:

Technical Assistant: This person will be a member of the Department of Agriculture staff, with working knowledge of the Lavington area, knowledge of small farmers and quantitative surveying techniques, with a Diploma in General Agriculture, who will benefit from counterpart experience to learn resource management.

Project Committee: The Project Committee will be composed of the Project Manager, the Technical Assistant to the P.M., the Country Team Leader of CARDI - St. Kitts, the Agricultural Extension Officer for the Lavington District, and the Field Supervisor of NACO for Lavington-Lynches. This Committee will devise the detailed workplan for the sub-project in conjunction with the Team Social Scientist and will carry out the selection process of farmers. The Project Committee will meet on a regular basis to coordinate the activities of the various divisions involved in the Project.

Overall Administration: Overall coordination of this component of the Project lies with the Permanent Secretary in the Ministry of Agriculture, Lands, Housing and Development. The Project Manager will report directly to the Permanent Secretary. In turn the Project Technical Assistant for this component will be from the Department of Agriculture and will be the local counterpart to the Project Manager and will aid in coordination of the Sub-Project with the overall Project and serve on the Sub-Project committee.

### Sub-Project Activities

After the selection process has been concluded and farmers are settled on the sites, activities to be carried out by the various divisions include:

- a. Agro-forestry and planting of windbreaks on upper slopes and on plots - Department of Agriculture, Project Manager, Technical Assistance;
- b. Terracing - NACO;
- c. Cultivation practices - CARDI, Department of Agriculture, NACO Agronomy Unit;
- d. Conservation techniques - Project Manager/Technical Assistance, Department of Agriculture, CARDI;
- e. Data collection - Department of Agriculture, CARDI;

- f. Land preparation - perhaps initially NACO or the Department of Agriculture through its equipment loan program to small farmers;
- g. Tree crops - NACO Agronomy Unit - will include cash crops on slopes and fruit tree crops in ghaut areas; Department of Agriculture (seedlings);
- h. Irrigation - determined by short-term design team.
- i. Demonstration plots - CARDI, Department of Agriculture;
- j. Monitoring and evaluation - Project Manager, Sub-Project Assistant, Project Committee.

#### Technical Assistance

While there is good expertise within NACO, the Department of Agriculture and CARDI with respect to cultivation practices and questions of crop diversification, technical assistance will be needed in the areas of soil conservation and agro-forestry. While there is a Peace Corps Volunteer attached to NACO's Soil Conservation Unit, who can be utilized, there are no professional staff in the Department of Agriculture with expertise in forestry or agro-forestry with respect to Project design, implementation, data collection, monitoring and evaluation

#### Requirements

- a. The Government must be willing to turn over the 40 acre small farm sites selected to long-term leases (20 years) under the administration of the Department of Agriculture. Option to buy should be given to the leasees should the land be put up for sale either before or at the expiration of the lease.
- b. Criteria for the selection of beneficiaries must be strictly adhered to. The selection process must occur at the earliest stages of Project implementation. The decision of the Project Committee on the selection of farmers must be binding.
- 3. The Government will need to release the individual selected as Sub-Project Assistant to the project for the life of the project. The Technical Assistant will continue to be paid by the Department of Agriculture.

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Equipment Analysis Supplement

A. Institutional Details

1. St. Kitts Details of NACO's Personnel, Plant and Vehicle Fleet, and Workshop Tools

NACO manages and maintains its entire plant and vehicular fleet via its Agricultural Engineering Department. The department is headed by a British qualified Kittian agricultural engineer. The administrative section of the department has in addition to the agricultural engineer a Peace Corps engineer, a clerk and a secretary.

The vehicular fleet supply and maintenance operations are carried out from two area workshops, located at Sir Gillies and Hope, and the central workshop located in Buckley. The operations in the workshops are carried out by the following personnel:

- 3 Firemen In-charge
- 3 Storekeepers
- 4 Grade I Mechanics (Master Mechanics)
- 9 Grade II Mechanics
- 4 Master Welders
- 3 Assistant Welders
- 12 Grade III Mechanics

These personnel are assisted by a small administrative staff and 9 labor force.

Each workshop has several sets of basic tools (spanners, sockets, special extraction tools, screwdrivers, jacks, lubricating equipment, etc.) necessary for carrying out basic maintenance operations. All major maintenance operations are carried out at the central workshop at Buckley. At the central workshop there is the following additional equipment:

- (1) 25 ton press for bearing, brushing, and after work
- (1) 50 ton caterpillar tractor track press
- (1) Rotary drilling machine capable of taking up to 1 1/8 inch drill bits
- (2) 10 ton hydraulic jacks
- (1) 2 ton portable crane
- (1) 3 ton mobile block and tackle lifting equipment
- (1) Steam cleaning unit
- (1) Air compressing unit
- (3) Welding units (electric and gas)
- Several tyre-rim extractors

Each of the two regional area workshops has a small stores unit for fast moving spares as well as fuel and lubricants. The central workshop has a relatively large store with about \$40,000 worth of spares. Included are two 500+ gallon storage tanks and about 2,000 gallons of lubricants.

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The following is an inventory of the vehicular and plant fleet managed and maintained by NACO:

- (42) Ford Agricultural Tractors
- (18) Massey Ferguson Agricultural Tractors
- (65) Roadless Ploughmasters
- ( 4) International Harvesters
- (18) Track Marshall 55-56 Cane Loaders
- ( 4) Roadless Ploughmaster 78 Cane Loaders
- ( 8) Caterpillar D38 Cane Loaders
- ( 1) Caterpillar D4E Bulldozer
- ( 2) Track Marshall 75C Bulldozer
- ( 3) Track Marshall 75C Crawler
- ( 2) Trucks
- (43) Land Rovers
- ( 1) Datsun Car
- ( 5) Honda Motor Bikes

All the above equipment is British made with the exception of the car and motor bikes which are Japanese made. This is due to the fact that NACO inherited the above fleet and plant from estates that had very close ties to Britian.

All NACO's Bulldozers are old and operating at far below peak efficiency. As a result, none of the three dozers are capable of working to any significant degree in the ghauts (gullies).

2. Nevis Details of the Public Works Department - Nevis' Personnel, Plant and Workshop Tools

The Public Works Department maintains the Government's entire plant and vehicle fleet in Nevis. This work is carried out by the Government's central workshop. All work is carried out by a foreman who is a master mechanic and three mechanics. There are a few sets of basic tools (spanners, sockets, pullers, etc.), a small store carrying fast moving spares, lubricants and fuel, and the following tools:

- (1) Portable drilling machine.
- (2) 5,000 kg hydraulic jacks.
- (1) 152 kg mobile crane.
- (1) Mobile block and tackle lifting equipment.
- (1) 20 ton hydraulic press.
- (1) Electric and gas welding unit.
- (1) Compressed air unit.

Some of the plant repaired and maintained by the PWD and located at the workshop is as follows:

- (1) Massey Ferguson Agricultural Tractor (over 10 years old)
- (1) Aveling Barford Motor Grader (14 years old)
- (1) Caterpillar D-6 Bulldozer (17 years old)
- (1) Asphalt Distributor

B. Bulldozer Procurement

The reasons for the Government's desire to procure a Caterpillar D6D tractor bulldozer for St. Kitts and including Barbados for source requirements are as follows:

1. Reliability - All NACO's Caterpillar machines have given NACO excellent service.
2. Maintenance - All NACO's mechanics have been trained and are fully conversant with Caterpillar maintenance and repair procedures.
3. Tools - NACO's central workshop has a reasonable range of Caterpillar maintenance and repair tools.
4. The Caterpillar Company's local agent is based in Barbados - Plantrac Ltd. This agent has given NACO excellent service. Spares and special repair assistance have never been a problem due to the service given by Plantrac Ltd.
5. NACO's flatbed trailer for transporting the dozer to the various sites is capable of carrying the Caterpillar D-6 machine.
6. NACO is concerned that if another make of machine was purchased, major maintenance and repair training will have to be given to all NACO's mechanics (25) - a major additional expenditure. Also there will be a considerable expenditure on tool purchase.
7. NACO's enquiries have revealed that Plantrac Ltd. would be prepared to give NACO mechanics training in the maintenance and repair of the D-6 machine (if purchased) free of charge. In addition, a 5% basic machine cost spares kit will be supplied free of charge. NACO has been told that they could decide on the spares needed.

The reasons outlined above apply in general to the Public Works Department of Nevis as well.

The special requirements with respect to the two bulldozers for St. Kitts and Nevis are as follows:

Caterpillar D6D power shift track tractor 74 index guage including:

- Angle Dozer Blade
- Crankcase Guard
- Hinged Radiator Guard
- Track Guiding Guard-Ends
- Front Pull Hook
- Lights
- Precleaner with Prescreener
- Tool Kit
- Sealed and Lubricanted 20 Inch Extreme
- Service Trucks
- Instrument Panel Guard
- Locks
- Hydraulic Control

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- Ripper
- FOB
- Export Boxing/Preparation
- Inland Freight
- Ocean Freight (one bulldozer to St. Kitts and  
the other bulldozer to Nevis)
- Insurance (All Risks)
- Documentation

Social Soundness Analysis

A. St. Kitts

1. Demographic Profile of St. Kitts

In 1980 the island of St. Kitts enumerated 33,881 persons. The population of St. Kitts is declining. Its peak was in 1960 when 38,273 persons were enumerated. The decline is historically derived from crisis in the sugar industry and is more strikingly evident when figures from St. Kitts and Nevis are examined. According to census data the enumeration of 1844 registered 32,748 persons - 23,177 on St. Kitts and 9,571 on Nevis. The population grew slowly for the next 50 years and peaked during the international sugar crisis in 1891 at 43,963. Nearly zero population growth for much of a century is the result of heavy out-migration. It is estimated that the 1960's witnessed the largest out-migration, as high as 30 per 1,000, so much so that in 1970 the population was approximately the same as in 1871. The result of this migration were demographic changes - declining fertility rates, death rates and changes in the age structure.

The fertility rate fell in the 1970's. In 1970 the total fertility rate (TFR) approximated 5.0. By 1980 it had fallen to about 3.6, representing a crude birth rate of 27, quite low by Third World standards. However, given the limited land space and small size a TFR of 3.6 is high for a small nation. This means pressure for land and jobs will continue in the near future and emigration will be relied on to ease social tension and maintain quality of life.

The aging of the population was a corollary of migration patterns from 1960. Medium age increased from 16 to 20 and the proportion of the dependent population under 15 declined to 37% in 1980. At the time of the most recent census there were just over 3,000 persons in St. Kitts over 64. The largest cohort is the working population aged 15 - 44 totalling 13,792 persons - 6,774 men and 7,018 women. This is of significance for planners, as until the year 2,030, the highest priority will need to be job creation.

Sector	1975	1980 Est.
Agriculture, forestry and Fishing	4,701	4,558
Manufacturing	2,138	3,026
Construction	541	600
Utilities	264	272
Trade and Tourism	1,637	1,690
Transport and Communications	N/A	N/A
Services	3,912	3,484
Other/Not stated	N/A	N/A
	<u>13,200</u>	<u>13,630</u>

Enumeration of the sectors of the economy indicates that agricultural employment remains the most important sector in the twin-island state. The sugar industry is the largest employer in St. Kitts. During the 1983 crop NACO had 107 monthly paid staff and 3,221 employees; of the

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employees 1,349 were cane cutters and 586 were involved in transport, loading, and other field work. St. Kitts Sugar Manufacturing Corporation (SSMC) had 39 monthly and 731 weekly paid employees during the same crop. The annual average is around 3,500 employees in the sugar industry of whom approximately 1/3 are women. During the "dull" season (out-of-crop) the number employed drops sharply. The sugar industry is the largest single employer, but work is seasonal, and under-employment is a way of life for significant numbers of the working-age population. Additional problems for the agricultural labor force arise with the vicissitudes of sugar production.

During periods of drought, tons produced decline and wages decline accordingly. While wages in the sugar industry increased between 10-15% per annum between 1978 - 1981, this has fallen to 3% due to a drop in sugar prices. To make matters worse, while EC\$1.3 million was paid in bonuses in 1982, no bonuses were paid in 1983. During crop, a cane cutter can make over EC\$100 a week and a woman EC\$60; during dry season wages decline significantly as workers are usually only allotted two work days a week. Thus the sugar sector, employs the largest number of persons, but this high percentage of the labor force is subject to seasonal employment and fluctuating wages.

According to a recent survey conducted by the Caribbean Agricultural Research and Development Institute (CARDI) there are approximately 898 small farmers in St. Kitts, 50% of whom are also employed seasonally by the sugar industry. The average acreage cultivated by small farmers is between 1 and 2 acres. An acre plot is estimated to yield between EC\$20 - 50 per week depending on the season and crop. The average age of the small farmers surveyed was 40.

Other major sectors of employment are manufacturing and services. There is growing industrial sector in St. Kitts which employs predominantly women (80%) in assembly operations. The public sector, which includes the sugar industry, is the largest employer in the island, employing 7,400 persons or 50% of the labor force and contributing 45% to GDP. Thus, public sector wage agreements have a tremendous impact on the economy and have been partially responsible for the movement to deficit since 1981.

## 2. Quality of Life Considerations

Skewed land use patterns (to be discussed later) and seasonal wages contribute to lower quality of life indicators in St. Kitts when compared to other OECS countries. According to the Caribbean Food and Nutrition Institute moderate malnutrition occurs among significant numbers of various age groups. For example, 20% of school age children are considered moderately malnourished, as are 26.5% of adult males. In fact, infant mortality rates are the highest in the Eastern Caribbean indicating nutritional problems. There are high numbers of still births and low weight births. Studies indicate large sections of the population do not receive adequate amounts of fresh fruit and vegetables; 78.6% of the vegetables are imported.

However, educational levels are high by Third World standards. Comprehensive schooling is compulsory up to the age of 15, and according to a 1981 UNESCO survey only 2.69% of the population is estimated to be illiterate while 8.88% are estimated to be functionally illiterate.

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### 3. Agricultural Systems

#### a. Plantation System

Present farming systems in St. Kitts are an outgrowth of the plantation system established in the late 17th Century. St. Kitts was the first Caribbean sugar colony and for over 350 years sugar, and the culture and society its production entails, have determined the social and economic fabric of the island down to the present. The typical sugar plantation in St. Kitts comprised around 200 acres with at least one-third planted in cane and the remainder divided into units for grazing, local food production, field rotation and wasteland. Under slavery, the slave huts of the laboring population were built on wasteland, along the ghauts and along the wind-swept saline littoral. Planters allocated small plots for slave cultivation; slaves were expected to basically feed themselves. These provision grounds were of marginal quality and usually located in mountainous areas, far from the huts, above the fertile fields of the estate. This land-use pattern is the origin for the practices found in St. Kitts today. Indeed, in many respects cultivation practices, land management and social relations have changed little from the classical period of plantation economy.

However, since 1975 when the Government of St. Kitts took over the administration of all the sugar estates of the island creating NACO (National Agricultural Corporation) an accelerating decline of the plantation system has been occurring. Acreage cultivated in cane has declined to approximately 11,600 acres. Yields (which picked up in the late 1970's after the assumption of state control) have also been declining since 1980. Estate houses and infrastructure are in various stages of ruin throughout the island.

Additionally, the transfer of ownership from the traditional plantocratic elite to the State occurred during the period of growing nationalism and the assumption of political power by the black majority. In 1975 the party in power had as its political base the Trades and Labour Union which represents sugar workers. The assumption of public ownership of the estates thus occurred at a time of important social transformation. However, although the superstructure which administers the sugar industry has become the province of Government policy, the actual day-to-day running of estates continues in the traditional manner albeit with decreased authority for estate managers.

#### b. Small Farm Systems

Unlike the Windward islands of the Eastern Caribbean which never developed into full-bodied plantation systems and have a long history of small farming systems and communications, small farmers in St. Kitts have operated as an adjunct to the dominant plantation mode of agriculture. Estate land occupies over 90% of all arable land in St. Kitts. Throughout the period of private plantation ownership destabilization of the eco system occurred. Forest clearance and indiscriminate use of land led to soil depletion and erosion. The removal of vegetation resulted in loss of precious topsoil during the rainy season as ghauts were created and water rushed down from the mountains to the sea, while droughts became more frequent and a long-term problem the rest of the year.

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Domination of the land by estate agriculture meant that there was virtually no escape from plantation labor. Only those lands which became seriously eroded and depleted were available for small farm agriculture. Lack of alternative opportunities led to widespread migration first to newer sugar colonies such as Trinidad and British Guyana and later to Jamaica, Costa Rica and Panama. Since World War II migration has been to the developed world, primarily the United States as well as to the U.S. Virgin Islands. Those who did not migrate continued to work on the estates, especially during crop and to rent plots of land from the estate owners. These lands, in the main, have been in the eroded areas, on plots on high mountainous ground and cultivation in the ghauts. Hence, small farmers in St. Kitts are farming the most marginal lands, and lacking the financial ability, are doing so without applying needed inputs, such as fertilizer. Overgrazing has also occurred throughout lands adjacent to estates and charcoal production for both home consumption and sale is denuding remaining forest cover and vegetation. These practices are the outcome of a traditional land use policy which allocates arable land to cane production and insufficient attention is paid to the needs of small farmers and producers of domestic crops.

Small farmers can be divided into three types.

( i) By far, the largest number are estate workers, agricultural laborers who garden small plots for home consumption, especially critical during the out-of-crop season when workers are guaranteed only two days work per week.

( ii) The second type are those who have been largely successful over the years in extricating themselves from estate labor and who only work during crop as cane cutters to supplement their income. Their goal is to become independent small farmers.

(iii) The third type, and the smallest in numbers, are full-time farmers. These farmers will cultivate between five and twenty acres, most however, cultivate between two to five acres. Another grouping has recently become more evident, these are market gardeners who are largely professional people and young aspiring businessmen who see a future in vegetable production and are leasing plots for the purpose of producing for both the domestic and export markets.

c. Women. While data from a recent survey carried out by CARDI indicates that the majority of small farmers are over 40 and are male, significant numbers of women lease land in St. Kitts and farm with the aid of their children. Approximately 60% of part-time small farmers in the Lavington-Lynches area are women.

d. Youth. Recently, there is a noticeable growth in the numbers of young men interested in farming, providing they can make a profit from the venture. Presently, the deterrants to successful small farming are such as to discourage young people from entering into the occupation on a full-time basis. The risks are perceived as too great. However, solution of land tenure issues, availability of low-lying arable land, information on vegetable production, marketing, and solid conservation practices, as well as attention to the problem of monkey depredation of crops would act as an incentive to the expansion of small farming in St. Kitts.

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e. Land Use

According to the land use surveys carried out in the late 1970's about 55% of agricultural land was cultivated with cane. Steeper slopes above ghauts and sugar land had mixed uses - food crops, tree crops and livestock. The south-eastern peninsula was very underutilized while the north-east is intensively cultivated.

TABLE 7

St. Kitts Land Utilization

	<u>St. Kitts Acres</u>
Forest and Scrub	10,000
Gentle Slopes	22,000
Settlements and Sub-divisions	2,600
Derelict land, ghauts	2,000
Salt ponds, etc.	<u>41,600</u> acres

As we can see from Table 8 the majority of small holders farm less than 2 acres and most farm less than one quarter of an acre. Those farming under two acres are primarily estate workers. The small farming strata is made up of approximately 160 individuals working from two to twenty acres.

TABLE 8

Land Holding in St. Kitts

<u>Acreage</u>	<u>Number of Holdings</u>	<u>Share of Total</u>	<u>Total Area</u>	<u>Average Size</u>	<u>Share of Total Land</u>
Less than 0.4	1,036	57.7%	703	0.16	1.68%
0.4 - 2.02	1,222	34.7%	2,482	0.82	5.92%
0.02 - 20.3	161	4.6%	1,425	3.58	3.40%
Above 20	106	3.0%	36,939	141.0	88.14%

4. Socio-cultural Feasibility

It is widely recognized throughout technocratic and governmental agencies in St. Kitts that ghaut reclamation, afforestation and soil conservation programs need to be developed and accorded priority. It is also recognized that some divestification out of cane and encouragement of individual small farmers would introduce a greater measure of equality in the land use system and redress a serious imbalance in the terms of trade caused by a high food import bill.

Within the village, however, while a small percentage of farmers recognize the problems of soil erosion, there is a little awareness of the relationship of cultivation practices to the process. There are long established traditions of ghaut cultivation, the tilling steep hillsides, overgrazing and slashing for charcoal production. There is, however, an eagerness for independence from the estate system and a desire on the part of many for control of land. This project provides a mechanism for people in the

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various parts of the island of St. Kitts to benefit both directly, in the area of Saddler's Village and Parsons, and indirectly at St. Gillies and in the Tabernacle area in a resource management project which transfers important conservation techniques to Kittitian institutions and individual farmers.

Within the institutional framework, the small farmer's scheme also provides a wedge for the various agricultural agencies to both gather and analyse data and co-operate in a mutually advantageous way, in a manner, heretofore, not formally developed. For the small farmer, the scheme provides an important support framework essential in an early stage of overall farm development in St. Kitts.

(a) Organizational Structure

The Project Design incorporates both an institution building feature and the transfer of technology and skills in the areas of watershed management, soil conservation, civil works and rural development. The ghaut stabilization sectors of the project, in particular, should build on the organizational capacity of both NACO and the PWD and strengthen these divisions. It is also true, however, that at certain times of the year, NACO in particular will be stretched thin; yet over the life of the Project and in terms of long range development, the project will be of benefit to local institutions and their technical personnel.

The Lavington-Lynches estate component of the Project will involve considerable reorganization of local patterns, albeit in a socially desired manner. Nevertheless, relocation of farmers from the ghaut and the steep slopes earmarked for afforestation will require some diplomacy. This will be achieved to a large extent by the desire for arable land and by composition of the sub-project committee which is comprised of individuals who both know the local inhabitants well and who also are locally and nationally respected. (See Annex H for detailed plan).

(b) Participator Profiles:

( i ) Small Farm Scheme

The Saddlers Village - Parsons area which surrounds Lavington-Lynches estate is located in the parish of St. John Capisterre on the north-east of the island of St. Kitts. The population numbers approximately 1,500 persons, of whom 350 men and women work on the estate during crop approximately 250 men and women work year round. Approximately 60% of estate laborers during crop are women, but only 5% of these are cane cutters; 40% of the year round estate labor force are women. Approximately 92 men worked as cane cutters last crop, and many of these men only work on the estate during crop; the rest of the year most work plots of land in the ghauts and on the slopes.

There are over 100 small farmers in the Lavington-Lynches area. Farmers plant over 20 varieties of vegetables and root crops in addition to fruit crops and livestock grazing. Farmers have traditionally cultivated the highland slopes and ghauts and consider themselves to have expertise in this type of farming, even though their practices have been a source of soil erosion. Farmers, because of this, often in fact prefer to cultivate steep slopes. A major deterrent to further slope

cultivation are the monkeys which inflict heavy damage to vegetable and fruit crops unprotected on the high slopes. Plots are often not contiguous and it is difficult for farmers to monitor all their plots effectively. Farmers consider monkey depredation of crops their biggest risk factor.

While the recent CARDI Small Farmer study\* stated that the average age of the farmer was over 40, within the last five years there have been noticeable increases in the number of young men entering into farming. In the Lavington-Lynches area, there are a number of young men eager to become full-time farmers and who have a genuine love of the land.

Young farmers are representative of St. Kitts, nearly all will have completed primary school, most having attended up to the compulsory age of 15. Local farmers are eager to try new market varieties of vegetable crops, particularly for export and for the hotel sector. The older farming population are less educated and more traditional in their cultivation practices. Extension agents find the farming population open to suggestions on the use of inputs such as pesticides and fertilizers.

Farmers are accustomed to paying economic rents for the leasing of land in St. Kitts. Farmers in the Lavington area have farmed the same plots for generations, but there has been a turn-over from the older generation who have either died out or migrated, and the younger generation have only been farming from five to ten years. For these people rents have increased significantly from about EC\$3.60 to EC\$30 an acre. Kittitians are anxious for security of tenure and most would welcome outright ownership. For the sub-project component, only those who will accept long-term leases will be considered.

Criteria for selection is spelled out in Annex H. Priority will be give to those cultivating the ghaut and the highland slopes signalled out for afforestation.

#### (ii) Ghaut Stabilization

In the Sir Gillies and Tabernacle area residents may not directly be involved in the project except as laborers in the crews working on the ghaunts. The primary participants in ghaut stabilization will be professional staff of NACO, PWD and the Department of Agriculture who will have the opportunity to increase their skills in areas severely lacking in St. Kitts. These areas are of high priority if the fertility of the soils and the watershed are to be stabilized.

### 5. Social Consequences and Benefit Incidence

#### (a) Ghaut Stabilization and Soil Conservation

##### ( i) Sir Gillies Ghaut

Benefit to be desired from Sir Gillies Ghaut will be both in terms of demonstration effect and stabilizing the agricultural area surrounding the ghaut which includes not only cane land administered by NACO, but a sizeable chicken farm.

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\* "Small Farmers Survey" CARDI - St. Kitts, 1981

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( ii) Hope Ghaut

Stabilization of Hope Ghaut will be of crucial importance to residents in the Tabernacle area both in terms of saving a needed road which gives farmers access to their plots and connects villages, but even more importantly, in salvaging the main water pipe line which serves the entire north-east down to Dieppe Bay. Hopefully, as well, residents can be discouraged from farming the slopes and engaging in charcoal production while the production of tree crops will be encouraged.

(iii) Lavington Ghaut

Stabilization of Lavington Ghaut and the terracing and afforestation of lands along the ghaut will go a long way to providing watershed management of an important agricultural area which includes a large number of small farmers. This area of approximately 1,500 persons is an area opening up for small farmers, therefore, resource management and ghaut stabilization are a priority.

(b) Small Farm Scheme

This sub-component of the Project has been enthusiastically received by several individuals associated with agricultural agencies and the administration of the estate because of the benefits to be derived to the area and its residents. The sub-project provides an opportunity not only to broaden small farmer development in St. Kitts, and particularly in the parish of St. John, but does so in a manner which will provide demonstration effects for all small farmers and will provide data useful to governmental agencies with responsibility for small farm development.

Farmers will be encouraged to engage in crop production of varieties which have a market and which will not flood the local market bringing down prices. Crops will be those chosen, suitable to the soil of Lavington-Lynches.

The Project will also give the Department of Agriculture the opportunity to oversee small farmer development by taking over responsibility for the 40 acres from NACO. The latter does not have the extension capability to aid small farm development. Additionally, the Department of Agriculture will soon be implementing a small farm equipment loan scheme which should benefit sub-project farmers in terms of land preparation.

Technical assistance provided by USAID, CARDI and the Department of Agriculture ensures that the selected farmers will not simply receive land and be abandoned, but will receive needed monitoring throughout the life of the project and beyond through extension efforts.

Employment should be increased as a result of the introduction of this component of the project, as heretofore, most small farmers are either idle part of the year or supplement their subsistence and cash cropping with estate labor. Care in the selection process will ensure that those chosen will be good farmers who need more land in order to increase their income and become independent of estate labor which becomes more precarious with each sugar crop.

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While it is true that displacement is a factor in this component of the project, farmers are being displaced from the least fertile, least accessible land which is largely cultivated because no other land has been available. Land hunger is endemic in St. Kitts, every plot which becomes available has many takers, hence Kittitians will tend to view this as an opportunity rather than deprivation. The land which is available for use, while producing low yields of cane, has been determined to be good soil but needing inputs of fertilizer. Thus production should rise or farmers who are removed from the ghaut and slopes to this somewhat flatter, arable land.

With respect to questions of social relations, power and participation, there is no doubt that redistribution of the land in St. Kitts and diversification will over a time cause a shift in social relations, as is occurring throughout the island and throughtout the Region. St. Kitts is really the last vestige of the old plantation system in the Commonwealth Caribbean and just as opportunities have expanded for the mass of the population in political participation, so too greater access to resources is almost an inevitable process as the monolithic hold of the plantation system is weakened. The strict criteria proposed for the selection of farmers is to ensure that the most equitable system will be implemented and monitored and abuses do not occur. Farmers will be encouraged to participate at all levels of the project in consultation with the sub-project committee. The local estate manager, who is highly respected by the local inhabitants, has also enthusiastically supported the concept of the Project and will be asked to participate in the sub-project committee. All the other members of the committee are also not only respected technocrats from participating agencies, but well known to the local inhabitants. Thus, this project provides an opportunity for local residents to work with experts in creating a model small farm system with long term positive social consequences for land use in the north east of the island.

## 6. Demonstration Effect and Its Diffusion

### (a) Ghaut Stabilization and Soil Conservation Efforts

There are numerous agencies and their professional staff involved in this Project who will directly gain expertise and knowledge in the areas of soil conservation, civil works, watershed management, resource management and agricultural engineering. Staff of NACO, P.W.D and the Department of Agriculture who are in positions of responsibility and who will continue to set policy and carry out maintenance will be involved in all stages of reclamation. The widespread effect alleged to be achieved by the USAID sponsored Basic Human Needs Project at Greenhill will be replicated in different parts of the island and will hopefully lead not only to better land use practices but to a watershed management policy for the island of St. Kitts. As an important component of this project is technical assistance and training, both professionals and work crews will benefit from the transmission of techniques to be applied in their work schedules at the close of the project. Short course training will be provided to two technicians in soil conservation and in watershed management.

(b) Small Farms Scheme

While terracing and civil works in the ghauts and highland slopes will transfer expertise and knowledge to professionals and their staff on issues of soil conservation and watershed management, the public will derive a greater understanding not only of the need for, but the actual benefits to be derived from, conservation techniques and improved cultivation practices. This will occur not only on demonstration plots but on the actual plots of small farmers and will be monitored and analyzed by CARDI and Agricultural Extension. Extension agents, as well, will be able to spread and diffuse knowledge gained from this Project. The surrounding villages, and farmers will be cognizant of practices implemented and within the context of the small society of St. Kitts hopefully a multiple effect will occur.

B. Nevis

1. Socio-Cultural Background

Both St. Kitts and Nevis, have a long history of plantation agriculture. But while sugar remains a major pillar of the economy in St. Kitts from mid-nineteen century Nevis has gradually abandoned sugar cultivation and become an island of sharecroppers and small holders. Nevis, only 36 square miles, and nearly circular in shape is dominated by a volcanic peak of 3,200 feet. The island is boulder strewn with a heavy clay soil and many areas are prone to drought. Thus, Nevis does not have an eco system to sustain plantation agriculture for export and has reverted to small holders engaged mainly in subsistence and production for the domestic market in St. Kitts. Cotton, which was produced in the 17th Century before the era of sugar estates, has been reintroduced and constitutes the primary cash crop. Nearly 80,000 lbs. were produced from over 200 acres in 1982.

The population of Nevis has been declining since 1891 when it reached a peak of 13,087. According to the 1980 census just over 9,000 persons reside on the island. This actual decline is the result of very heavy out-migration, particularly since World War II to the Virgin Islands, U.S.A., Canada, U.K. and Antigua. Nearly a century of migration coupled with the decline of estate agriculture has produced a more egalitarian society than in St. Kitts. Nearly the entire population is of African descent, and stratification is determined by educational level and occupational status. Nearly everyone in Nevis has access to land, although large numbers lease from the Government.

However, although land is a resource readily available, the quality of land and access to the most arable land is problematic. Nevis is far steeper and stonier than St. Kitts, which has inhibited mechanization. The less permeable clay soils of Nevis have also resulted in more soil erosion, while heavy overgrazing and charcoal production have created deforestation. Lack of access to water hinders both animal and crop production.

2. Land Tenure and Distribution

Approximately 45% of all holdings in Nevis are 1 acre or less; yet 10% of the holdings on Nevis do not have land attached. According to the 1975 Census of Agriculture, Government has acquired all estate land, over

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5,000 acres, approximately 1,500 acres of which are rented to individual farmers and also to co-operatives. On the largest estate, Maddens, whose acreage is over 1,000 acres of very poor, rocky soil, Government has established a livestock unit. The Government of Nevis is anxious to set up a land unit to determine the criteria for selling the land and resettling farmers. Given the continuing out-migration of Nevisian persons of working age, determining the size and marketability of the land is a priority and yet will be problematic.

However, security of tenure may go some way in stemming the tide of migration. Once farmers have formal land rights which can be used as collateral for loans, the incentive to remain on Nevis and farm should rise. Also, tightening up of migration possibilities in places such as the U.S. Virgin Islands and the Bahamas also increases the motivation to remain in Nevis and earn a livelihood.

Agricultural co-operatives and a co-operative credit union movement thrive on Nevis as a result of the generally depressed economy and the problems facing small farmers, including drought, erosion and overgrazing. An interesting feature of co-operatives is the large participation of women. It is estimated that over 50% of Nevisian farmers are women, and nearly 80% of co-op members are women. Women thus are an important segment of the small farm system in Nevis and attention needs to be given to their particular problems as single heads of households who are also farmers.

TABLE 9

Average Land Holding, Nevis

	<u>Number</u>	<u>Holdings</u> <u>%</u>	<u>Acres</u>	<u>%</u>
Households without land	213	10.4	-	0
0 to 0.9 acres	953	46.3	393	2.2
1 to 4.9 acres	698	34.0	1,618	9.0
5 to 99.9 acres	147	7.2	2,891	16.1
100 to 499.9 acres	39	1.9	7,917	44.2
500 acres and over	<u>4</u>	<u>0.2</u>	<u>5,108</u>	<u>28.5</u>
TOTAL	2,054	100.0	17,927	100.0

SOURCE: Summary Report on the Census of Agriculture, 1975.

Recent surveys completed by CARDI basically concur with this breakdown in land use, demonstrating that the system has remained stable in the last 10 years.

3. Socio-Cultural Feasibility

Aspects of this project are deemed of very high priority by most knowledgeable people in Nevis as well as by donors and regional agencies. The measures envisioned by the Project are those which need to be carried out if production is to be maintained or increased. Additionally, much land remains uncultivated in Nevis due to constraints which this project is designed to

begin to redress. Feasibility of specific project activities will have to be carried out by a sub-project committee in consultation with, and perhaps composed of, agricultural extension officers, CARDI personnel, and the farmers themselves whose land will be affected.

#### 4. Participator Profile

It is the intention of this project to provide improvements for existing small farm units in Nevis. Although there are other donor activities in Nevis with respect to water projects, they are for domestic and industrial purposes. An important aspect of this project is small agricultural water projects including the construction of water catchments for irrigation. Removal of boulders, terracing and soil conservation activities are also envisaged for small farm units.

However, as in the St. Kitts small farmer component, virgorous criteria for selection must be set down and adhered to, so that those farms needing the most urgent attention are considered; and that the farmers are selected in a socially accepted egalitarian fashion, one which meets the overall design of the project in terms of resource management for Nevis.

A second set of participants are Ministry personnel. The establishment of the Land Unit and the role of the Project Manager in developing Watershed Management Plans, and in carrying out a number of sub-project activities will provide the Ministry counterparts with a comprehensive approach to resource management. Thus a central purpose of the project is to strengthen the institutional capacity of the Ministry of Agriculture in Nevis. Key to the success of this aspect will be training, both on the job and by short courses.

However, careful attention will have to be paid to the selection of personnel and to the types of courses and training from which they can benefit. Nevis has three persons leaving shortly to do degree courses in agriculture; one in livestock and two in general agriculture. The pool from which the Ministry can best draw are recent "A" level achievers who have passed CXC examinations in agriculture. These persons are now qualified to do diploma/degree courses in agriculture, and therefore have few professional skills. There is a high priority in Nevis to draw on these types of individuals. The courses available to them, however, in soil conservation, hydrology, etc. may be quite limited. Careful assessment will also have to be made of which personnel can best benefit from training in the use of personal computers.

Also, participating will be persons trained in heavy plant operation and maintenance and in surveying.

#### 5. Social Consequences and Benefits

This Project is viewed as phase one in land use policy, planning and conservation in Nevis. As such, the project components have important social consequences. Certainly, those farmers whose units are selected for improvement are going to directly benefit from these activities. It will be important to have the Project Manager interface with both CARDI and CARDATS. These organizations have the capability to assess what further steps farmers

should take to maximize their resources. A recent Baseline Survey carried out by CARDI-Nevis should be helpful in that regard as will data gathered from CARDI's USAID funded Small Farmers Multiple Cropping Research Project.

Long-term benefits to the agricultural population as well as to institutional development will be provided by the creation of the Land Unit and the training of personnel. The latter should not occasion any dislocation in power and influence, but rather provide more opportunities for young Nevisians to remain on the island. The skills of existing personnel, particularly agricultural extension officers, will be expanded and aid in the information provided to the Nevisian farming population.

#### 6. Spread Effect

Perhaps the greatest impact of this project will be the results of development policy and plans with respect to watershed management, soil conservation and surface water development. The implementation of such policy will have major ramifications for land use in Nevis. The establishment of a Land Unit, with responsibility for zoning and the development of a plan for disposal of Government lands, (while not expressly mandated by this project) will in the future have significant impact on Nevisian society.

Hopefully, the activities implemented by this project will serve as models for agricultural development, and through the medium of agricultural extension agents as well as individual farmers, reach the majority of small farmers in Nevis. As Nevis is an especially small society, once the Ministry, CARDI and CARDATS are involved in information dissemination effect should be widespread.

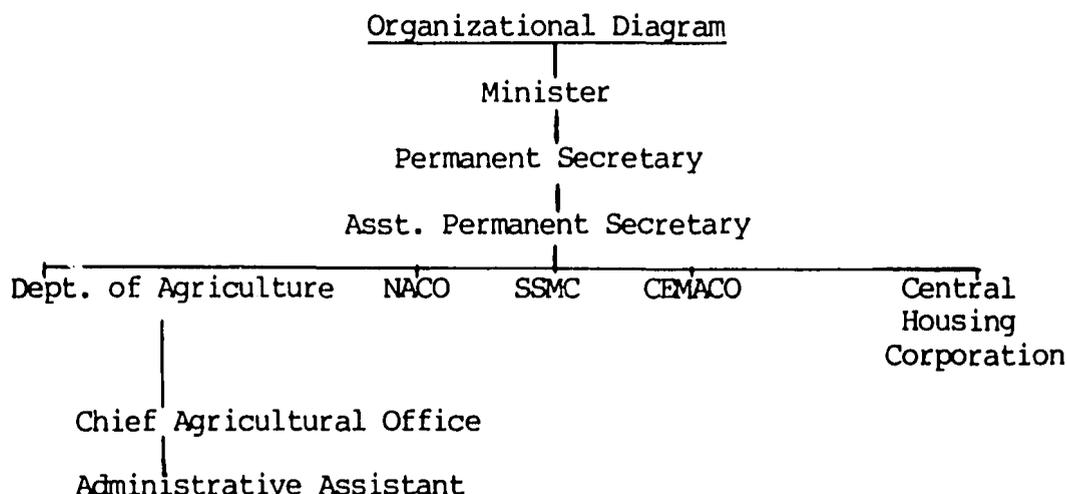
Administrative Analysis

A. St. Kitts

Implementation of this project will be undertaken by the MOA under the guidance of the Permanent Secretary. The Ministry has overall responsibility for both NACO, whose Engineering Division will carry out the soil conservation and ghaut stabilization sub-project, as well as for the Department of Agriculture which will largely oversee, in conjunction with CARDI, the small farmer sub-project. The involvement of the P.S. should ensure the necessary coordination and division of resources needed to successfully complete the task. Since the Ministry of Agriculture has responsibility for land use policy and the distribution of land in St. Kitts, it is important that USAID support this institution as the government begins to address the important problem of land use and the disposal of estate lands.

Figure 8

St. Kitts Ministry of Agriculture



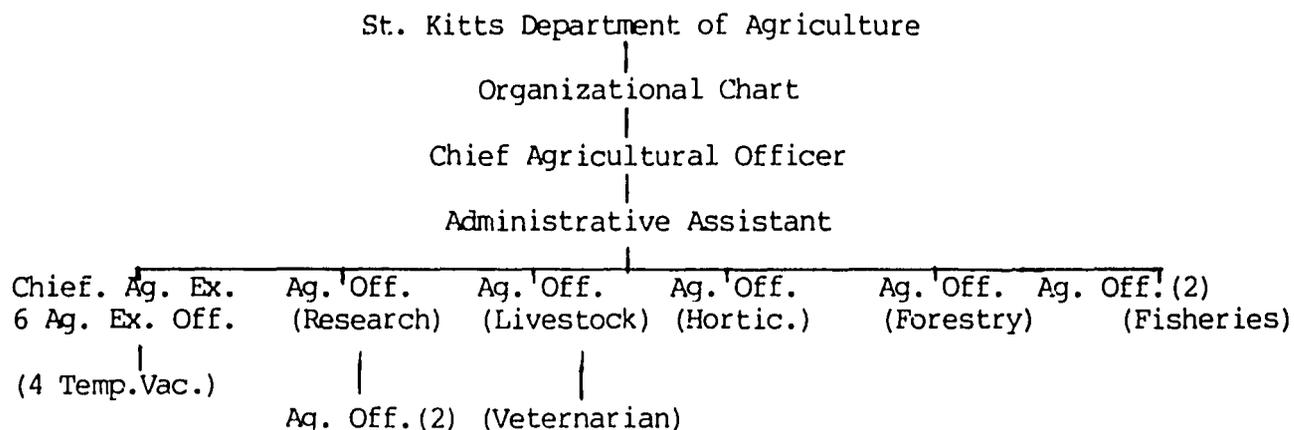
The Ministry of Agriculture, Lands and Housing is responsible for activities which constitute a major portion of the Kittitian economy including three statutory bodies, the National Agricultural Corporation, the St. Kitts Sugar Manufacturing Corporation, and the Central Marketing Corporation. In addition, the Portfolio includes Lands and Housing and their development. The Department of Agriculture with its divisions in research, fisheries, extension and livestock are under the authority of the Ministry. The Ministry has overall responsibility for developing and administering a land use policy and resolving the land settlement question including the completion of payments to former owners.

1. Department of Agriculture

The Department of Agriculture falls under the responsibility of the Ministry of Agriculture, Land, Housing and Tourism. The Department of Agriculture is headed by the Chief Agricultural Office (C.A.O.) with a small

staff of three professionals in administration, including a research officer. Total staff numbers 27. In addition to fisheries, forestry, veterinary services, and livestock units, the C.A.O. is in charge of Agricultural Extension. There are six positions in Agricultural Extension, however, presently only three are filled.

Figure 9



(a) Management

The Chief Agricultural Officer (C.A.O.) has primary responsibility for administering the Department, he is aided by an Administrative Assistant and chiefs of the various divisions. However, as staff is very short, the senior men in livestock, fisheries and co-ops serve as division heads. The C.A.O. serve on the Board of NACO as well. The Research Officer interfaces with CARDI and NACO in building up R&D capabilities. The Ag. Extension Unit is presently quite weak as there are three people in training and 1 trainee (who will return shortly). The Department has approximately 20 non-established workers. The Department has responsibility for all non-sugar agriculture in St. Kitts, particularly small farm development.

(b) Delegation of Authority

Because of the staffing situation and also the smallness of Kittitian society most of the line officers have great responsibility in their areas. There are a number of well-trained individuals in the unit who are anxious for further responsibility and have a clear vision of where they want the Department to go.

(c) Training and Qualifications

Presently, the Department of Agriculture is seriously understaffed. Yet, although there are shortages of qualified personnel, those in position are by all accounts, young, committed persons with good credentials.

(d) Staffing

The Department is seriously understaffed, a reflection of its step-child position vis-a-vis NACO which has up to the present received the bulk of government funding and inputs. However, there is growing interest in building up the Department and there are a number of young people in training who, when they return, will bolster the capability of the Department.

- In Fisheries there are two professional positions one person is in training;
- On livestock there are two professionals, one of whom is also trained in crop production and is also working in Extension;
- In Research there is one professional position filled by an MSc. in Agriculture.
- There is one Veterinarian
- In Co-ops there are two positions, the senior is filled by an appointee from CFTC
- In Forestry there are no professional personnel. There are five forest rangers patrolling the island
- In Agricultural Extension there are six positions in addition to Chief; only 2 ag. extension officers are actually in place. Three persons are pursuing diplomas, and one is in training.

In addition to personnel, the Department is also deficient in equipment and vehicles. Deficiencies are redressed to a certain extent by the non-formal coordination and interfacing between CARDI, the Agronomy Unit of NACO and professionals within the department of Agriculture.

(e) Assessment

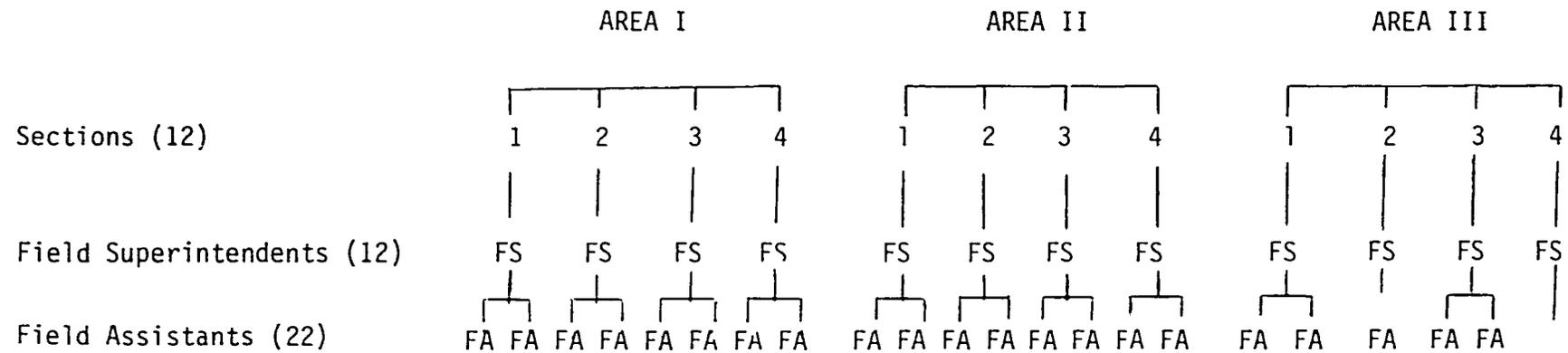
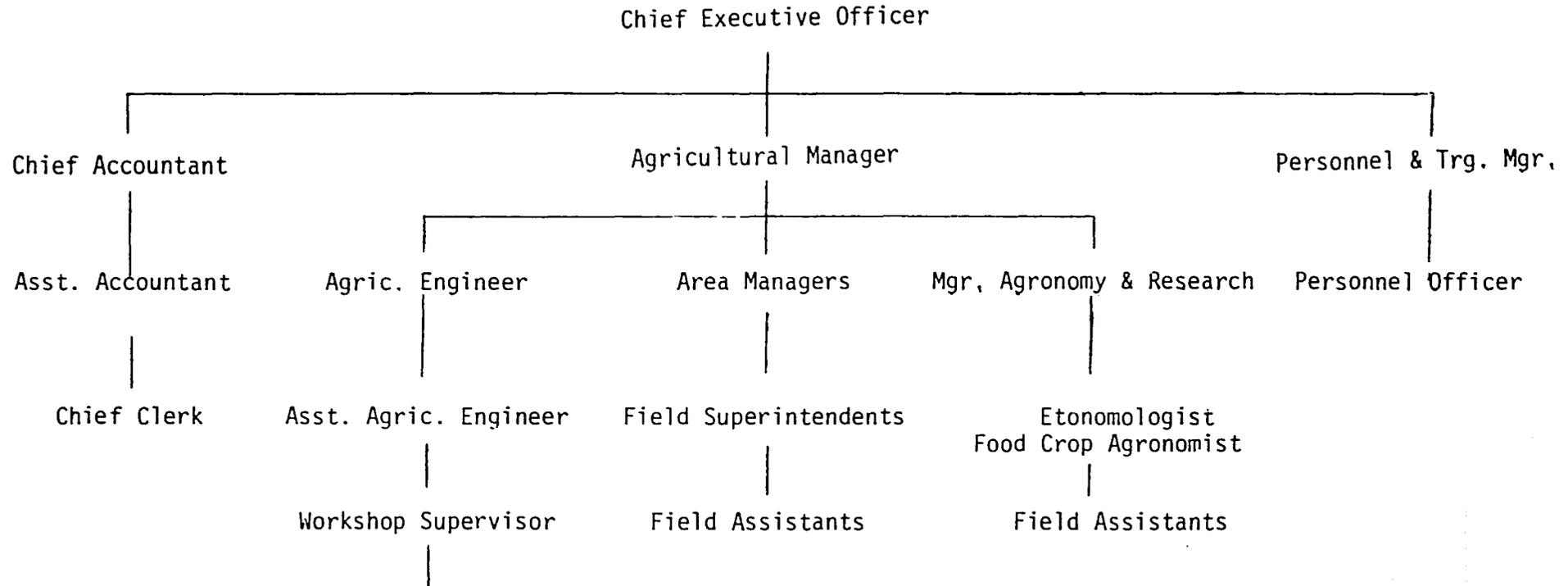
The Department appears to be undergoing a transformation with greater government interest in building up its staffing capabilities. Within the next four years there will be several well trained individuals in place, including another degree person. While government is cognizant of the need to build up the agricultural department, there has been little attention paid to the need for agro-forestry. Departmental skills in Resource Management will be improved through seconding an Agricultural Officer to the sub-project. However, government needs to be urged to provide more funding to the division for additional staff, and particularly an individual in forestry.

2. National Agricultural Corporation (NACC)

NACC is a government owned corporation responsible for the management of the sugar industry in St. Kitts, including the production of sugar cane on estates, assisting cane farmers and encouraging the development

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NACO - Organization Chart



of other agriculture on lands not suitable for cane. NACO came into existence in 1975 after a period of crisis in the sugar industry. In this period, NACO took over administration while operations were run by Bookers. Both administration and operations are presently run by NACO, a statutory corporation of the Government of St. Kitts.

(a) Organization

NACO is administered by a Board consisting of a chairman and seven directors. The Chairman is the incumbent Minister of Agriculture and the Deputy Chairman is the Permanent Secretary in the Ministry of Finance. The Directors include the following: The Permanent Secretary in the Ministry of Agriculture, the Manager of the National Bank, the Chief Agricultural Officer, three representatives from the Trade and Labor Unions and a supply officer. The Chief Executive Officer of NACO acts as Secretary of the Board. The Board is responsible for overall policy and planning of the Corporation.

The Chief Agricultural Officer (C.A.O.) of the Department of Agriculture is the only Director with Agricultural expertise. The Chief Executive Officer of NACO as Secretary of the Board can only make advisory inputs to the Board. Given these conditions, the appointment of the Minister as Chairperson, in effect erodes NACO's position as a semi-autonomous state corporation and elucidates a state corporation under considerable political control. The NACO Board is responsible for hiring of personnel.

NACO is administered by a Chief Executive Officer (CEO) who has overall responsibility for the corporation and the major divisions concerned with budget, personnel, production, research and maintenance. The CEO is assisted by an Agricultural Manager who not only serves as Deputy but is primarily in charge of all aspects of production including the engineering and R & D staff.

(b) Production

For the purposes of estate administration NACO divides the island of St. Kitts into three areas, each administered by an Area Manager. Area one comprises that section of the island between Willets and Wingfields Estates. Area two comprises the north side of the island between Hermitage, Lavington-Lynches and Dieppe Bay. Area three is the Basseterre area between Cunningham to Stone Fort Estate. Under each Area Manager there are two categories of managerial staff. Each area is further sub-divided into four sections, each section is headed by a Field Superintendent and assisted by two Field Assistants. Usually each Field Superintendent is in charge of more than one estate; estates average 250 acres in St. Kitts. The Field Superintendent is basically an estate manager, and a high proportion were managers prior to government takeover. Field Assistants are overseers of sections who also perform some clerical duties. Field Assistants supervise field laborers. The number of laborers varies from estate to estate. NACO employed approximately 3,330 full-time workers this past year. On Lavington-Lynches there are approximately 360 workers in crop and 250 out-of-crop.

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(c) Management of Production

While the Agricultural Manager has overall responsibility for setting production goals and making day-to-day decisions on the various estates, Field Superintendents of particular estates have considerable discretionary leverage in the actual day-to-day operations. However, with the establishment of NACO the complete control the Estate Manager had over the running of an estate and its laborers has been considerably eroded. The strength of the Union, and its bargaining position via-a-vis NACO and the Government of St. Kitts has also diluted the power of Field Superintendents.

Most Field Superintendents are men of long experience in estate production, in fact the average is 30 years of experience in estate agriculture. These men are a product of the traditional pattern of plantation management and many would have difficulty in making the transition to modern management practices. However, since NACO has basically added a super-structure to the existing estate organization, often practices remain as they have been for generations. Many of these men will be approaching retirement within five to ten years.

Field Assistants, however, tend to have formal agricultural training, many have diplomas in agriculture. NACO considers this line to be the managerial pool of the future and has implemented job qualifications which include five "O" Levels with passes in English, Maths and Science as compulsory in order that trainees can meet the entrance requirements for the region's agricultural college in Trinidad. Thus, Field Assistants tend to be younger and have more formal training than their superiors, Field Superintendents.

(d) Training

NACO attempts to upgrade the skills of management personnel in production through provision of long-term scholarships to agricultural institutions and on-site training in both management practices and agricultural seminars. Although NACO has been sending two persons a year for training, presently there are few persons qualified to take advantage of additional training.

(e) Staffing

As NACO is a state created corporation formed to oversee the operations of all estate agriculture in St. Kitts, the personnel employed include civil servants, political appointees, technocrats, estate managers and laborers drawn from traditional sugar villages and the larger society. Given the nature of its development, few systems for selection and appraisal are in place. NACO, because it is the chief employer in the country, has been fortunate in that it has been able to attract young technocrats to fill managerial positions. As the Chief employer of labor, however, NACO also operates as an estate owner and continues to run estates on non-corporate lines. Thus, management and staff relations are complex. Salaries at certain levels are quite low, while at the same time political realities are seen to require the maintenance of a large pool of laborers. Only managers,

supervisors, clerks, drivers and artisans have permanent employment status; all others are hired on a casual basis. Criteria are largely based on Field Superintendents discretion and political considerations. The trades and labor Union play an important role in this regard. Estate workers have little of loyalty to NACO and absenteeism is high, most workers prefer to attend to their own plots except during the light of crop.

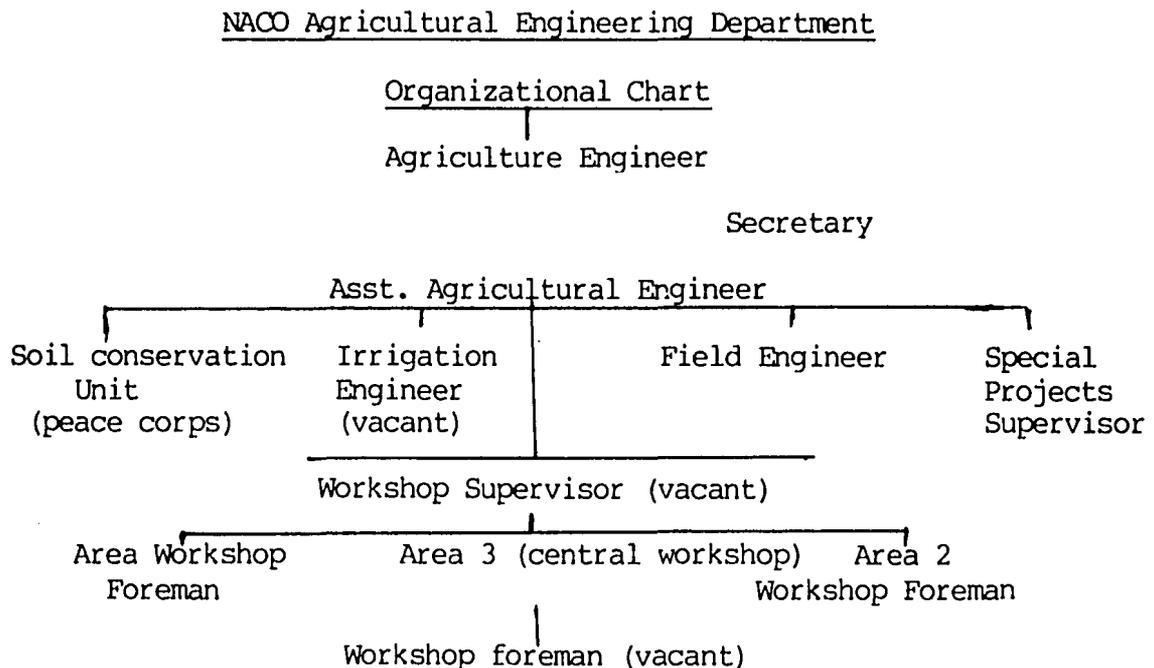
(f) Assessment

NACO as an institution is driven less by the profit motive and rationalization of agriculture and more by political realities and social factors. This is less international than it is the product of the manner in which the corporation came into existence and because of the overriding role sugar plays in the economy and society. Given NACO's dynamic and the attention that must be devoted to estate agriculture, NACO's role in the project will be primarily in Agricultural Engineering. However, Overall managerial responsibility will lie with the Ministry rather than with NACO management.

3. NACO Agricultural Engineering Department

Much of the work for this project will be carried out by the Engineering Division of NACO. The organization of the Division is as follows:

Figure 10



The head of this unit, the Agricultural Engineer, oversees a division of NACO responsible for the maintenance of both the physical infrastructure of much of the island as well as maintenance and repair of machinery and land preparation for sugar cultivation. Overall policy for this

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decision is set by the Board. However, coordination of activities occurs at the level of head of divisions who meet under the chairmanship of the Agricultural Manager at least once a month to set up production schedules and co-ordinate machinery needs.

(a) Management of Engineering Division

Management of this division primarily rests with the Agricultural Engineer, assisted by the Assistant Agricultural Engineer. Given the constraints in staffing (discussed below) the Agricultural Engineer has primary responsibility for the first line including soil conservation, irrigation and field preparation and maintenance, while his assistant is virtually the overall manager of the island's three Workshops. In addition to supervising soil conservation and irrigation programs, the Agricultural Engineer monitors the status of all machinery and is responsible for the division's budget and accounting which is then sent to the Chief Accountant of NACO. In terms of soil conservation, the Unit is responsible for all soil conservation works on the island—planning, costing, implementation and maintenance. Because this position is presently occupied by a Peace Corps recruit, the Agricultural Engineer plays a close supervisory role. In terms of the Irrigation Unit, the division is stretched very thin. Firstly, the position is vacant and is being held by the Peace Corps Volunteer, supervised by the Agricultural Engineer. Secondly, the staffing for the Unit is quite thin (3) three persons, while the Unit is expected to oversee and maintain up to 50 acres of sugar cane, 4 acres of vegetable crops, 3 acres of the Taiwanese vegetable project and half acre cane nursery.

The Unit under the Field Engineer Unit, with responsibility for all implements and machinery such as ploughs, harrows and sprayers has basically been subsumed under the auspices of the workshop foremen of Areas One and Two.

The Special Projects Unit is headed by a person of long corporate experience who primarily manages the central workshop of NACO.

(b) Delegation of Authority

Given the shortage of professional personnel the Agricultural Engineer has little need to delegate authority but rather involves himself on site in the directing of all conservation and irrigation activities as well as overall direction of the maintenance of machinery.

(c) Training and Qualifications

At the management level of the Division there are a number of persons with both the corporation and the sugar industry. However, few, except the Agricultural Engineer have certificates or diplomas in agricultural engineering. The Agricultural Engineer has both long experience in the industry, as understudy to the BDD engineer when NACO was formed in 1975 as well as a certificate in Agriculture and diploma in Agricultural Engineering from Great Britain. The Assistant Agricultural Engineer has no formal training but over twenty years experience in the industry. His skills lie

primarily in the area of mechanics. This is also the case for the Special Project Supervisor. The Field Engineer has had a course in Field Application with Massey Ferguson. Most supervisory staff have taken courses in management, the most recent being those sponsored by OECS and CARICAD under USAID funding.

(d) Staffing

Each Unit within the division employs a number of workers. The majority of workers have skills in mechanics and are employed in the three workshops. Each workshop also has a component of welders. The soil conservation unit employs a group of seven laborers who have long experience working as a group in the area of soil conservation. The irrigation unit also maintains its own work gang of three (3) persons, while the Field Engineer and Special Projects Supervisor draw their laborers from the workshops. Area One workshop employs fourteen (14) persons two of whom are welders. Area Two also employs the same, while Area Three, the central workshop, employs sixteen (16) including three welders.

In addition to the division being stretched thin in terms of numbers, the division until recently has suffered from fairly high turnover rates. There is a significant gap between the various grades of mechanic. The division loses about 20 percent of its mechanical staff per year. This is largely due to problems in the past with assigning short weeks of 3 to 4 days and the large numbers of persons who migrate after acquiring basic skills and experience in mechanics. The corporation has returned to five day work week and the paying of high salaries--comparable to those of mechanics at the sugar factory who earn the highest rates in the country. The division now recruits the bulk of its mechanical staff from the Technical College. Although students are of a high calibre, which should be an asset in the long run, their numbers do not make up for the shortage of grade 3 in NACO. Workshop foremen on average have attended Technical College and have 4-5 years experience with NACO.

(e) Assessment

NACO's Engineering staff presently is slightly understaffed at all levels to carry out its schedule of duties. In addition, the Soil Conservation Unit has need for a counterpart to work alongside the Peace Corp Volunteer and the Project Manager. NACO expects to hire such a person immediately. NACO's Soil Conservation labor force will have to be increased for the duration of this project. Provision has been made for this in the Budget and labor is available from the larger working population, where unemployment is estimated by the Planning Unit to be around 25%.

In-house-skill is good in the person of the Agricultural Engineer and the Peace Corps Soil Conservationist. The former will supply years of expertise in the field and a knowledge of the specific conditions of St. Kitts.

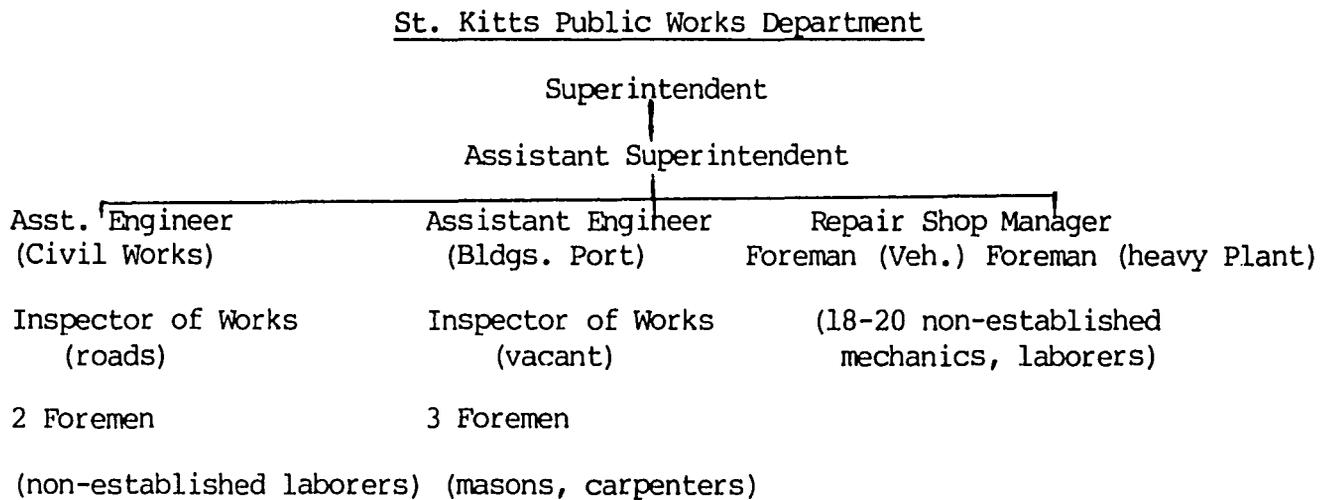
4. Public Works Department

The Public Works Department is a division of the Ministry of Communications and Works and is responsible for the construction and maintenance of all public roads, buildings, ports and the airport and government vehicles in the island of St. Kitts. The Public Works Department is headed by a BDD employee who has supervised the department for the last seven years.

(a) Organization

The Pattern of internal organization of the Department is as follows:

Figure 11



The Department which has major responsibility for all Public Works and Government Repair appears to be a well-run organization with good staff and management and by Eastern Caribbean standards, is quite efficient. In addition to the above responsibilities, the PWD houses Government Stores and does the purchasing of all parts and machinery for government industries. From conversation with the Superintendent and other employees, the stores are well-stocked and parts are not a problem. Most parts, which are ordered from abroad arrive within seven days. Procurement procedures appear to be simple and the Superintendent has good working relations with NACO at all levels, including interfacing with the Agricultural Engineer"

(b) Management

The Superintendent of the PWD appears to run a very efficient operation. Although there is a vacancy at the Inspector level, the PWD does not seem to have management weaknesses at the established workers level.

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(c) Delegation of Authority

Both the Superintendent and the Assistant Superintendent appear to be carrying out their responsibilities with considerable autonomy. The location of Government stores within this Division facilitates PWD's ability to perform tasks expeditiously.

(d) Training and Qualifications

The Superintendent is a qualified Engineer while the Assistant Superintendent has 30 years experience with the PWD. Both Assistant Engineers are qualified. The Inspector of Roads has no professional qualifications but has taken several overseas courses on roads construction and maintenance. Non-established workers including masons, carpenters and mechanics have various grades of training; many are graduates of the Technical College.

(e) Staffing

With a laboring staff of approximately 150 full-time workers, the PWD seems to be adequately staffed for an island the size of St. Kitts. Absenteeism is not a major problem except during the Christmas/Carnival season. Workers with the PWD do not, as a rule work on estates, and thus are available full-time throughout the year.

(f) Assessment

The Superintendent of PWD appears to have established a well-run organization and personally directs much of its efforts. The Superintendent has a good knowledge of all equipment and heavy plant and their working condition and efficiency. Additionally, a well-stocked store insures the maintenance of machinery and vehicles for the duration of the Project.

The Superintendent is assisted by a capable and efficient staff including the Assistant Superintendent who will be in charge of the day-to-day activities of PWD's component of the project and should spend from 30-40 percent of his time on site. There will be a foreman attached to the project and the necessary assistants. Depending on weather conditions, this aspect of the Project should be completed between 18 months to two years.

B. Nevis

The Government of Nevis is a part of the federation of the two islands of St. Christopher (St. Kitts) and Nevis. The island of Nevis has its own administration and its own Assembly under the jurisdiction of a Premier. The history of the two islands has been a stormy one. The islands achieved independence on September 19, 1983 after a coalition Government representing one Kittitian political party, the People Action Movement (PAM) and the Nevis Representation Party (N.R.P.) were able to work out a modus vivendi for governing the two islands. The compromise involved an article of the new Constitution which allows for the withdrawal of the island of Nevis from the State should a referendum demonstrate that two-thirds of the votes cast favor separation.

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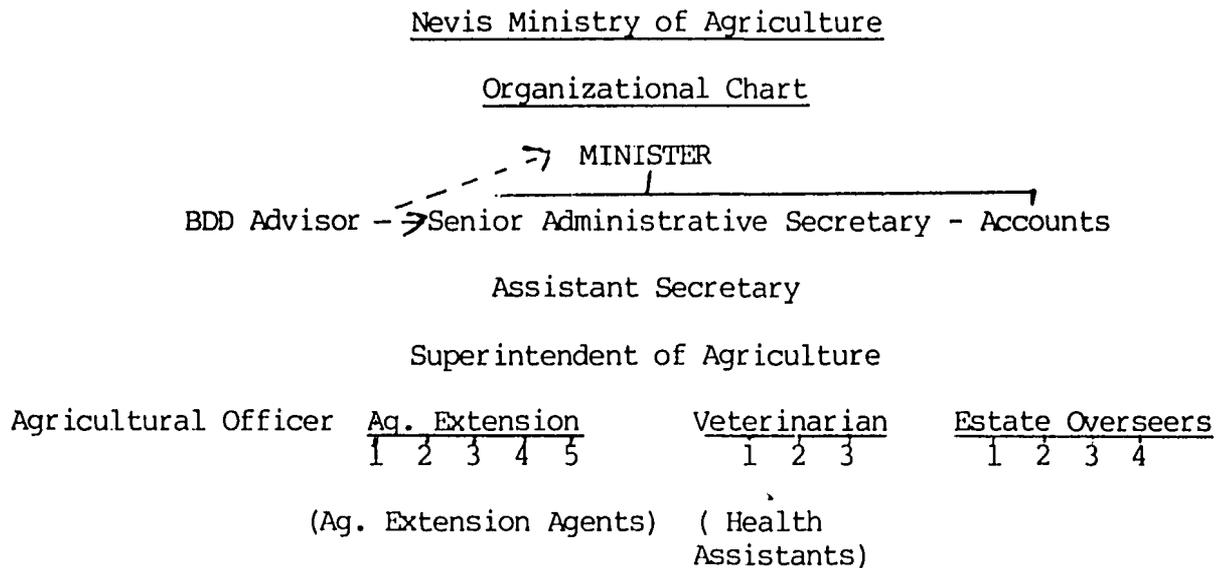
Within the last year the Nevis administration has been putting into place a quasi-ministerial system, headed by a Premier. There are four Ministries in Nevis: The Premier's Ministry, which includes Education, Health Social Services and Establishments, this Ministry is headed by a Permanent Secretary. The other three Ministries are the Ministry of Agriculture, Lands and Tourism, the Ministry of Communications and Works and the Ministry of Finance. These Ministries, which are new units, are headed by a civil servant on par with a Permanent Secretary, known as the Senior Administrative Secretary. The Premier also holds the portfolio of Minister of Finance.

1. Ministry of Agriculture, Lands and Tourism

The implementing agency for this sub-project will be the Ministry of Agriculture, Lands and Tourism. The Ministry although small in numbers has major areas of administration in Nevis as the portfolio includes overseeing government lands. Government is the principal landowner, having purchased 2,175 hectares of land from estate owners since the 1930's. The Ministry will play a significant role in the future of land use in Nevis. It is the Government's wish to turn the land over to small farmers and to this ultimate end a Land Unit is being established.

The Ministry of Agriculture is organizationally structured in a normal hierarchical manner found throughout the Eastern Caribbean - vis:

Figure 12



The Nevis MOA has a long-term BDD advisor, reflecting the recent colonial status of Nevis, who until recently operated as th Chief Technocrat in the Ministry and who reports to the Minister and the Senior Administrative Secretary. This person has played an influential role in policy formation in the Ministry. However, he is scheduled to leave the island shortly.

(a) Management

Because of the small size of Nevis the Minister and his civil servants are involved in close collaboration on a day-to-day basis. The incumbent Minister has an agricultural background and is knowledgeable about Nevisian conditions. However, a good working knowledge of donor agencies, their methods and operations are very new to Nevisians and there are no systems in place or overall policies in this regard. Again, the BDD advisor has played a major role in guiding the Ministry in the area of liaising with international agencies.

(b) Training and Qualifications

There are no vacancies in the Ministry and all of the professional staff have had at least diploma training in agriculture. In the case of the Superintendent of Agriculture, the person is a retired civil servant holding on while the person appointed to the post finishes their B.Sc. in Agriculture. The Veterinary division is headed by a CFTC technician. Nevis is fortunate that several students have been successful this last year in achieving "A" Levels in Agriculture and are available to go on to degree courses in Agriculture either in the region or abroad. Educating these students for the future is deemed a priority. Unlike St. Kitts, all five agricultural extension posts are filled by trained agriculturalists. Thus, Ministry personnel are in a position to benefit from the implementation of this project which involves further training and transfer of conservation and watershed techniques.

(c) Financing Process

Monies allocated to Nevis by donor agencies are placed in the Nevis Island government budget which is administered separately from the St. Kitts budget. The monies are lodged in the Premier's office which functions as the island's Planning Unit. Then, the Premier's office notifies the Ministry concerned when money is received. The Senior Administrative Secretary in Finance sends out a "departmental warrant" to commence a project. Once the warrant is received by the Ministry it is lodged in a "Vote Book" under the control of the Accounts officer of the Ministry. All vouchers made up for expenses note the balance.

If a project comes on mid-stream after Estimates have been received, the Senior Administrative Secretary writes a directive to the Ministry of Finance making out a case for "Appropriation". Once approved a number will be lodged for the project in Capital Expenditures.

Thus all components for this sub-project will be administered quite separately from the St. Kitts component.

(d) Assessment

While the Ministry of Agriculture in Nevis is fortunate to have all professional positions in place and a non-established staff of approximately 20 workers, the Ministry is quite impoverished and lack most

materials and machinery to carry out its directives. The establishment of the Land Unit will necessitate both considerable technical assistance and training, as well as the supply of materials including general office machinery and heavy machinery to carry out the tasks of conservation and watershed management. Technical assistance will be necessary in the first few months to teach Ministerial staff procedures with respect to procurement and accounting for the project. In effect, the establishment of a Land Unit in Nevis will be the first such project for the government entailing considerable institutional development.

Technical Analysis

A. St. Kitts Design

Erosion is the process of removal of soil from the land surface by natural forces. There are two general types of erosion; (a) geological (normal or natural erosion when the soil is under protective cover or natural vegetation), and (b) accelerated (soil loss in excess of the natural process of geological erosion). Three factors contribute to the severity of accelerated erosion:

- susceptibility of the soil resource (e.g., steep slopes and light soils);
- climatic stress (e.g., high intensity rainfall patterns);
- Destructive human use of the land (e.g., inappropriate farming practices, deforestation of sloped areas).

The severity of the problem depends on the interaction of these factors and erosive processes are usually powered by wind and water action. In the context of St. Kitts where local rainfall distribution is erratic and non-uniform (with the majority of the precipitation occurring within a few high intensity storms) and the island is entirely volcanic with steep to moderately steep slopes--the major cause of accelerated soil erosion is due to rainfall impact and water runoff.

St. Kitts is entirely volcanic with some localized outcrop of limestone. There are three distinct volcanic centers of andesitic basalt and agglomerate and their associated fans of loose, sandy andesitic ash. The southern peninsula comprise a chain of eroded volcanic islands fringed by recent saline and beach deposits. The distribution of slope classes is shown in Figure L.1. The distribution of soil group is shown in Figure L.2. The soil loss assessment from each of the soil mapping units in its simplified form is shown in Figure L.3. The severest soil loss is along the downslope edge of the volcanic cones in the east and west. The fans are slightly eroded but are cut by deep gullies.

St. Kitts lies at the northernmost end of the Leeward group of islands. The rainfall distribution is erratic and non-uniform. The frequency and distribution of rainfall varies from year to year. Figure L.4. shows data from selected stations for the period 1950 to 1981. Rainfall erosivity for St. Kitts illustrates the moderately high erosivity over most of the island except the central volcanic area where it is high. A Regression line for assessment of  $p^2/p$  from mean annual rainfall for St. Kitts and Nevis shows the frequency of occurrence of exceptionally intense storms, at 80 percent probability, is five times in every twenty years.

Agriculture in St Kitts is devoted primarily to sugarcane cultivation. The long field slope lengths and cultivation practices that have come with increased mechanical husbandry of sugarcane has aggravated the erosion problem. The upper watershed areas are under stress from inappropriate small farmer cultivation and tree felling for charcoal production. The effect of the increased erosion in the short term is to

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DISTRIBUTION OF SLOPE CLASSES

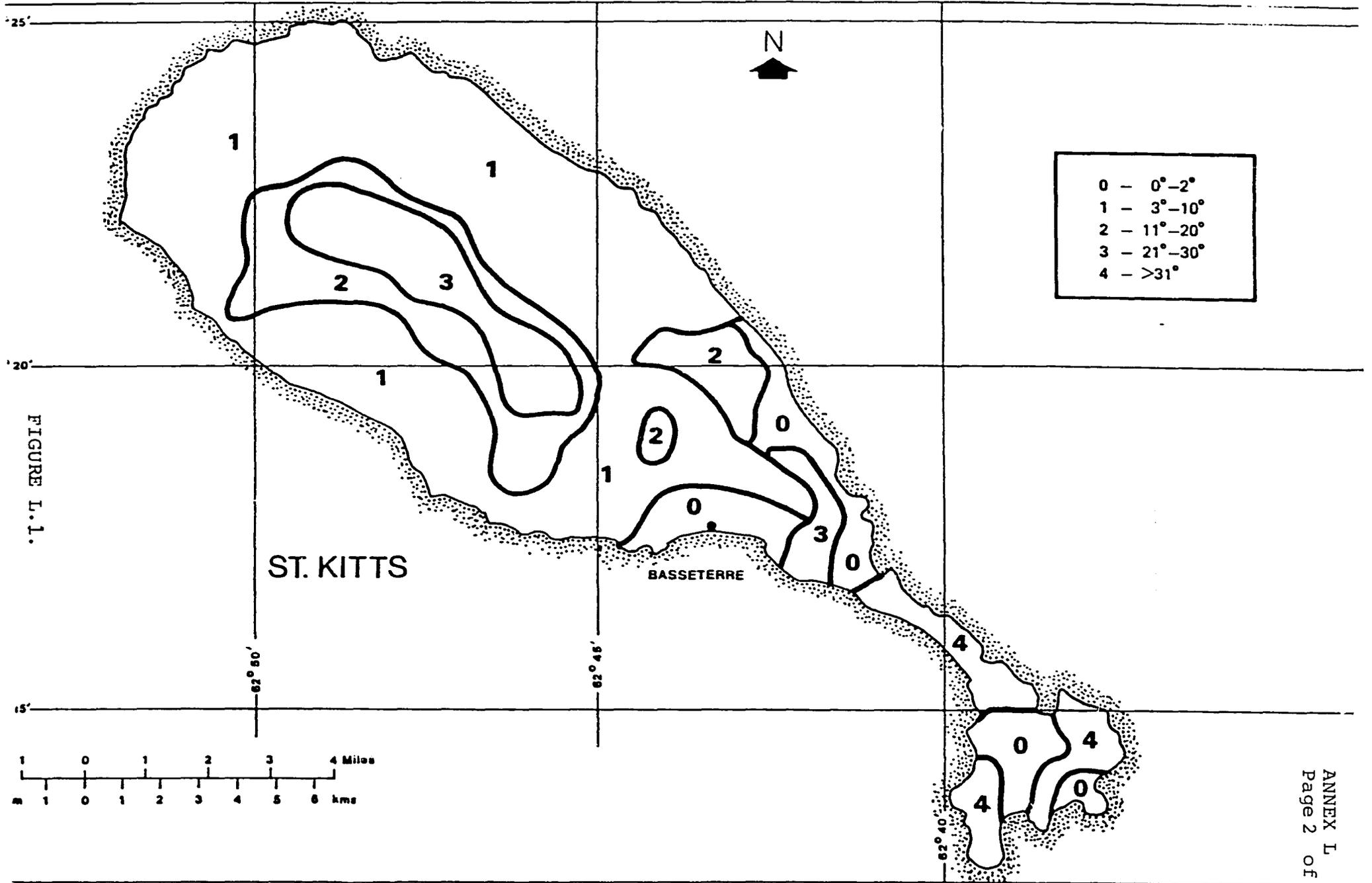


FIGURE L.1.

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DISTRIBUTION OF SOIL GROUP

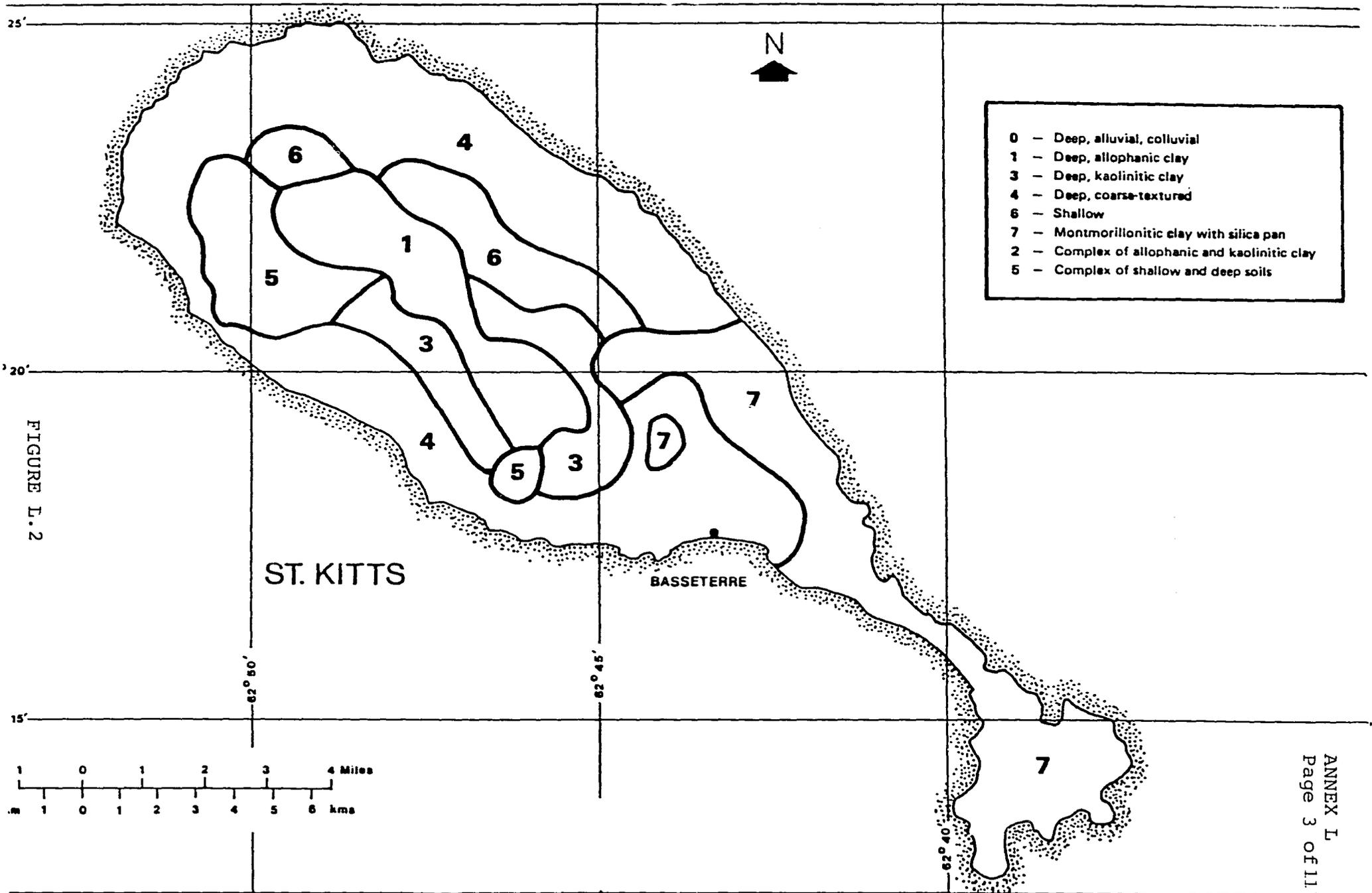


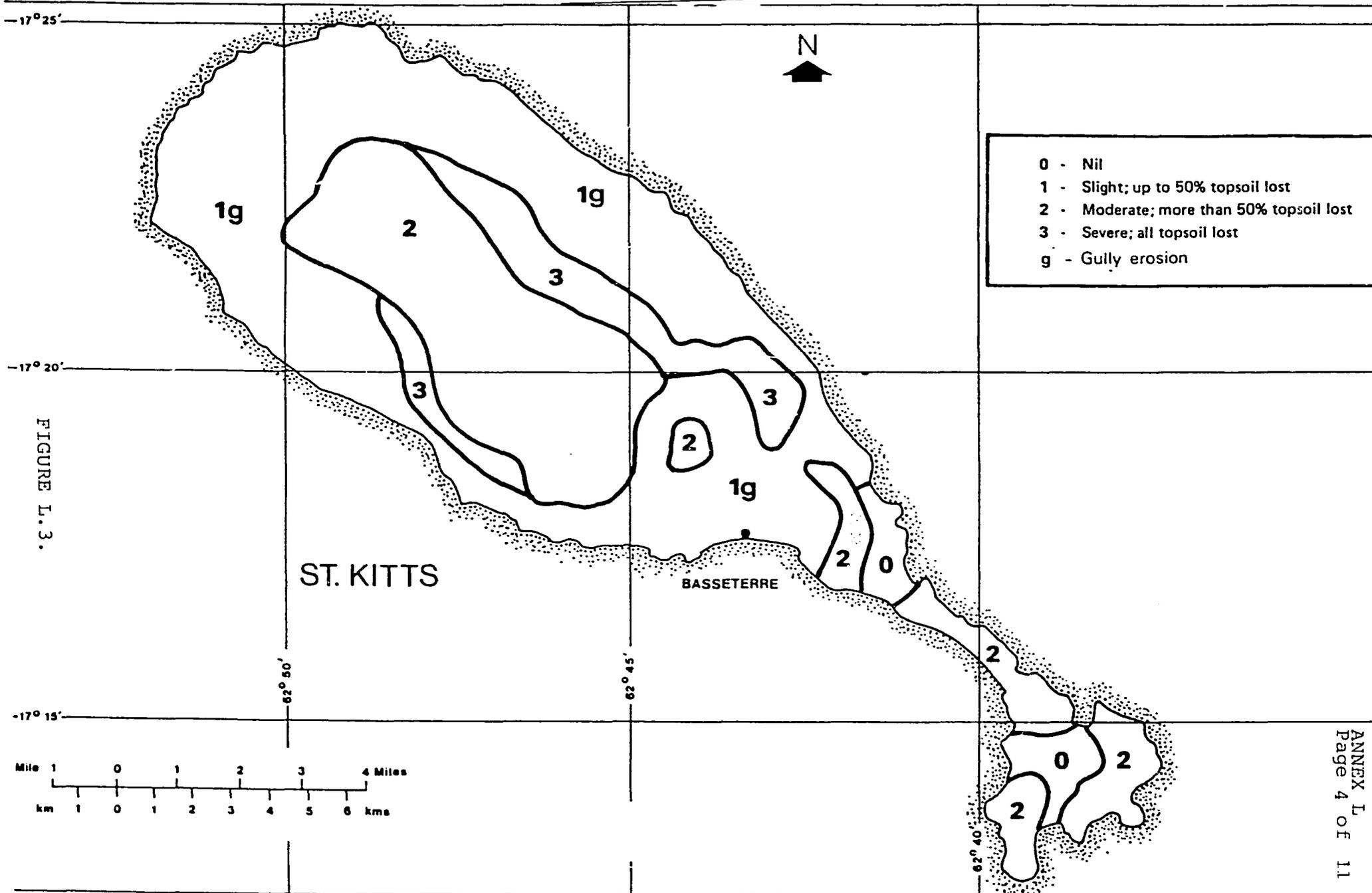
FIGURE I. 2

ST. KITTS

BASSETERRE

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SOIL LOSS ASSESSMENT



- 0 - Nil
- 1 - Slight; up to 50% topsoil lost
- 2 - Moderate; more than 50% topsoil lost
- 3 - Severe; all topsoil lost
- g - Gully erosion

FIGURE L.3.

ST. KITTS

BASSETERRE



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AVERAGE MONTHLY RAINFALL

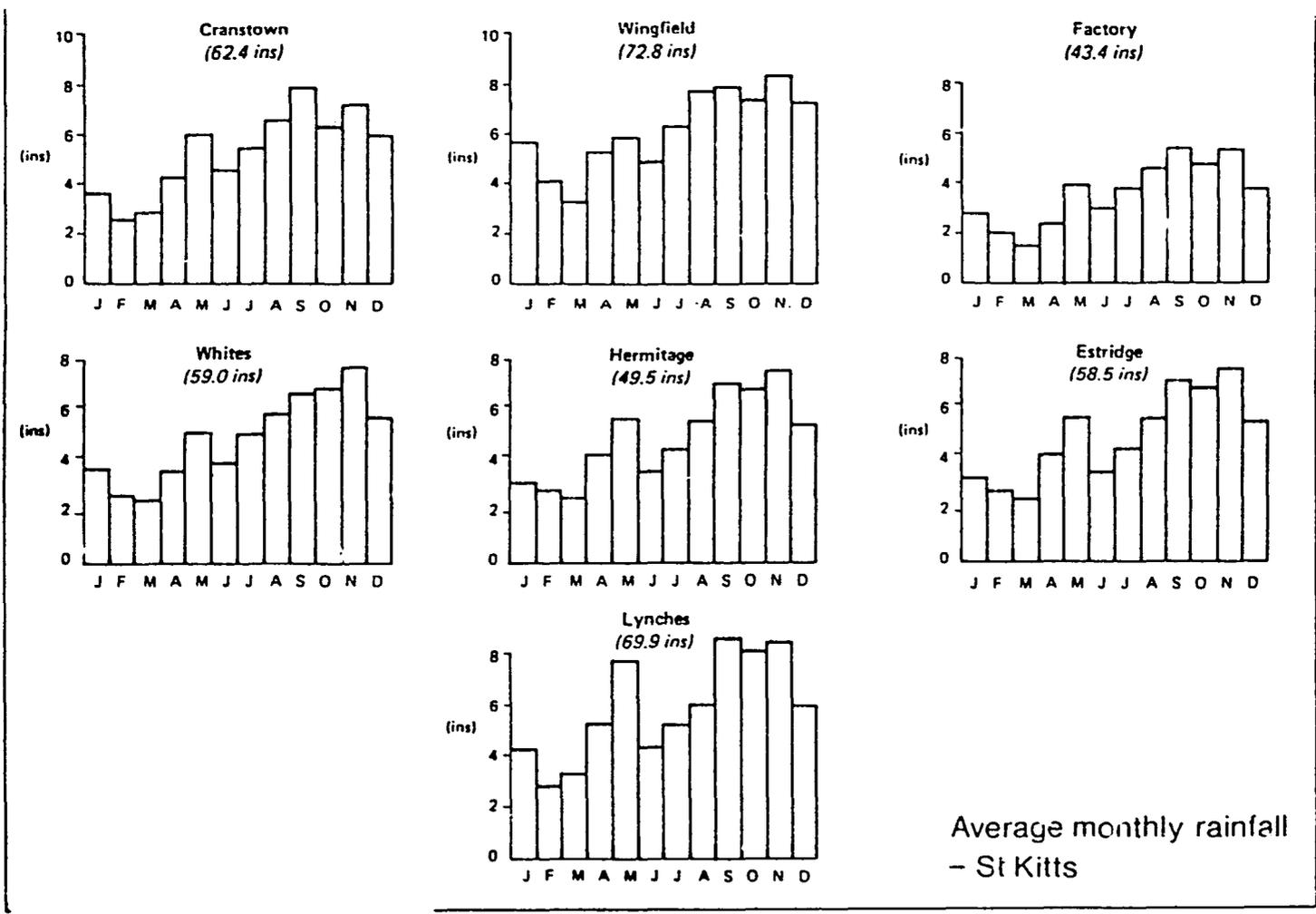


FIGURE L.4

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Average monthly rainfall  
- St Kitts

Increase soil fertility, and in the long term to render the land useless for supporting agricultural crops. An indication of this effect on agricultural lands in St. Kitts is the reduction of yields on upper elevation fields by as much as fifty percent in the last ten years. While fertile topsoil is being lost at a high rate (estimated at 300 tons/acre/year in some areas) the widespread decline in fertility resulting from soil erosion is not always appreciated. In many ways the problem is insidious due to the nature of the topsoil loss through inter-rill erosion (where thin layers of soil are removed by each rainfall and is almost indiscernible in the field due to the apparently slow but pervasive processes involved.

The gully erosion problem in St. Kitts is directly related to the excessive surface runoff which concentrates into larger channels, the increased volume and velocity of the water greatly increases the erosive and sediment carrying capacity of the stream as it moves down-slope. As the gully bottom deepens a sudden drop, or 'headcut' develops in the channel. Successive flows cause further deepening, and advances the head-cut upstream. The gullies formed by this process number over 100 throughout the island, with 39 of them considered to be a major problem.

The problem of soil resource loss on St. Kitts is characterized by excessive surface runoff causing topsoil loss and gully erosion. In the long-term, prevention of excessive runoff is critical to minimizing the damage caused to agricultural land. A short-term and expensive solution to the problem caused by gully erosion is direct treatment to slow the velocity of waterflow or prevent its contact with susceptible areas of the gully bed.

The objective of the USAID Project Team in selecting sites for treatment was to identify two areas in which civil works (e.g. construction of gabions, channelization) could be established to demonstrate effective methods of stabilizing a gully, and another area suitable for topsoil conservation treatments (e.g. terracing and cultivation practices).

Seven gully areas, identified by the Government of St. Kitts-Nevis as high priority areas, were considered for treatment; (a) Sir Gillies, (b) Hope, (c) Wash, (d) Lavington and Lynches, (e) College (f) Cayon, and (g) Sædler's & Harris. The criterion for site selection was based on the need for soil conservation in the area. Consideration was given to the nature of the problem (i.e., the type of gully and the characteristics of erosion in the area), the potential of the site for demonstration purposes, and the threat posed to the public good. A secondary concern was to select one site having an early state gully adjacent to agricultural land of undisputed title and of marginal quality (higher elevation "sugar" lands) which could be stabilized by terracing and provide a place for small farmers presently cultivating and damaging the gully and upper watershed areas.

The following is an analysis of the sites selected for activities, with a description of the problem to be addressed and a recommendation for the most technically feasible solution within the funding levels of the Project.

#### 1. Topsoil Stabilization - Lavingtons

The field bordering the gully in this area is a 135 acre rectangular block approximately 6000 ft. in length and 1050 ft. wide. The

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elevation of the lower edge of the field is 200 ft. and at the upper limit is 1050 ft. The upper slopes and areas adjacent to the gully are severely eroded. Productive capacity of the upper slopes has declined sharply in the last 10 years and now produces 50 percent less yield than the island average. Two-thirds of the field is in sugarcane. The remaining land (approximately 25 acres) is in peanut production or is fallowed.

The steep slopes above the field are in sweet potato and banana production. Trees are being felled for charcoal production, and livestock graze in this area.

There are three problems; (i) soil erosion on the sloped land in sugarcane production (especially the higher elevation land above the 600 ft. contour), (ii) farmers are cultivating sideslopes and bottom of the gully with annual crops, and (iii) the upper watershed is being farmed or trees are being cut for charcoal leaving the area subject to severe erosion.

The following actions are recommended:

- (a) construction of graded terraces;
- (b) establishment of pastures or agroforestry on slopes too great to be terraced;
- (c) provision for retaining the maximum amount of water on-site (this will be considered during the design and layout of terraces);
- (d) adequate routing and disposal of any excess runoff that might occur from the terraces (includes construction of storm drain and grass water-courses designed to minimize impact on gullies and village downslope);
- (e) provision for protecting both sides of Lavingtons Gully from erosion (planting tree crops on 40 ft. border from gully edge);
- (f) protection of individual farm allotments from wind (planting of appropriate windbreaks);
- (g) agroforestry production of economically valuable non-food crops (e.g., fuelwood, fodder, posts); and
- (h) establishment of a mechanism for testing and demonstrating new varieties and cultural techniques on a small portion of the land allocated to farm plots.

Terraces will be established in order to stop the loss of topsoil from the field. Graded terraces are recommended. Level terraces are expensive, require continuous maintenance, and considerable experience to operate. Furthermore, the instability of the sandy loam soils of the site require that the elevation difference between benches be as low as possible. Leveled terraces on the steep site would require large elevation differences.

It is suggested that the standard of Soil Conservation Service method of determining vertical and horizontal spacing of graded terraces be used.

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The equation is:

$$V I = x s + y$$

Where V I is the vertical interval, y is a coefficient depending upon soil permeability and x is an empirical quantity that may range from .4 to .8. However, the equation may be unreliable for slopes greater than 20 percent. For slopes less than 20 percent, and in sugarcane vertical spacing of 40 to 50 ft. should be sufficient. Based on this assumption and the equation, a rough 40,000 linear feet.

With proper terrace construction it is anticipated that the greater percentage of rainfall will be retained on-site, although occasional high intensity storms may produce some excess surface runoff. Waterways will be necessary to conduct this water from the lateral terrace drainages (cuts). The terrace drainages should have a gradient of no more than 2 percent where possible. Where this is not possible, cross bars with heights less than the depth of the cuts should be constructed across the cuts at appropriate intervals depending upon the drainage gradient. An interval of 20 feet or less should be used for gradients of 3 percent or slightly higher. At least every third terrace will be staked out by the short term technical assistance surveyor to guide the machine operator.

The access road which bisects the site will present some problems with the terrace drainages. Fortunately, the road generally follows the crest of a slight ridge. Therefore, the terraces on the southeast side of the road should be drained toward an existing swale to the southeast, and that those on the northeast side should be drained toward the Lavington Ghaut. Grass lined waterways will be used for the drainage and will follow the gully on each side down the slope of the field in a parallel manner. Careful attention will be given to protecting the gully areas from excess surface runoff. It will be necessary to protect and stabilize the banks and sidewalls of the Lavington gully. In some reaches the sidewalls are vertical and in others, steeply sloping. A buffer strip of trees suitable for agroforestry should be planted along the edge of the gully. The strip should consist of 4 or 5 rows of trees and should be located adjacent to the Lavington grassed waterway. Cost estimates for terracing, water source construction and planting of shelterbelt trees on gully banks is US\$125,000.

Forty acres of the top portion of the field will be allocated for small farmers. With first priority given to those farmers presently cultivating the gully or the upper watershed. The area will be fenced and each farmer will be leased on a long-term basis 1 to 2 acres of land. The Agriculture Department will manage the use of these lands and advise the farmers on appropriate cultivation practices. Support will be available to the farmers to diversify the production of annual food crops and to establish fruit tree and agroforestry cultivation. Farmers will be expected to cooperate with the agricultural technicians who in return will provide improved seed types, and planting stock of fruit and wind break trees. Data collected on this experience will be used to replicate crop diversification and improved cultivation techniques in other areas of the island. The long term objective of this activity is to determine the best cultural practices for soils on upland slopes. This could provide a model for the Government to follow in their soil conservation efforts in other areas where small farmers are cultivating the upper slopes and the gullies bordering NACO fields. The

short-term trade off of allowing farmers long term leases for the marginal high elevation 'sugar' lands should result in greater efficiency for rain fed agriculture and decreased soil erosion. The estimated costs of this activity are US\$56,000.

## 2. Gully Stabilization

### a. Lavington

The source of this gully is Misery Mountain. The upper reaches of the gully are steep, have good vegetation cover and are stable at the 1150 ft. contour. Below the 800 ft. contour some cultivation has recently taken place; Also sugarcane has been cultivated to the edges of the gully. As a result there is some minor soil instability on the banks of the gully.

The bed of the gully is composed of sandy gravel with some boulder formations at irregular intervals. The sideslopes are formed of the same material and are fairly well vegetated with some trees and tall grass. This is a 'V' type gully that is relatively stable.

The area under consideration for the Project begins at the 1150 ft. contour and ends at the 150 ft. contour, a length slightly greater than one mile. There is a banana cultivation in the upper reaches of the gully and a road which is regularly used. Further below are seven other banana cultivations -- in all of which cultivation has been carried out on the bed and side slopes of the gully. Towards the lower end, blackeyed peas and sweet potatoes have been cultivated on the upper sideslopes. The soils in the cultivated areas are unstable, but erosion is not serious at present. However, continued cultivation will worsen the situation. There is also some instability near a road crossing on the lower reaches of the gully where some gabion protection work has been carried out.

Downcutting and head-cutting of the bed and the slipping and sometimes collapse of sideslopes occurs in some unstable reaches of the gully. The gradient of the gully averages 16 percent. Water flow velocities are consequently high. This results in an accelerated cutting action in eroded parts of the gully that are not fully protected by vegetation. Gabion control structures will be required to decrease the velocity of runoffs in the unprotected areas. Seven locations have been identified for these studies. Total cost of this work is an estimated US\$70,000.

Further cultivation in the gully area should be in the form of agroforestry tree crops only. All annual crop production should be stopped, and all sideslopes should be returned to tree or grass. A strip of land bordering the gully should be planted in tree crops to stabilize the top section of the gully. The estimated cost of this work is \$20,000.

### b. Sir Gillies

The gully in this area originates in the lower slopes of Mount Misery. It begins at the 500 ft. contour and meanders until reaching

the road leading into the gully at the 100 ft. contour. The length of the section being considered is approximately 2700 ft. (along channel bed) the bed and slopes are composed of a gravelly sandy soil of volcanic origin.

The bed is relatively flat and stable with sideslopes at steep angles. Waterflows in the gully meander cutting into the sides causing collapse of the banks. The gradient of the bed averages 5 percent throughout the length of the gully except for higher gradients in a short section of the upper part of the gully.

Cultivation of sugarcane extends to the edge of the gully in some areas and there is evidence of farming and charcoal production in the upper watershed.

The bed is on a fairly low gradient which minimizes downcutting but encourages meandering of runoff as it courses through the gully. As the water takes the path of least resistance it cuts into the sideslopes causing landfalls and the loss of valuable agricultural land.

Stabilization of this gully requires that the runoff be channeled through the center of the bed. Bulldozer work will be required to build and maintain the channel. Gabion structures will be built in the channel to control downcutting of the channel itself. Total costs of this work is estimated to cost US\$50,000.

Establishment of a green belt area along the sides of the gully will be necessary. This 30 to 40 ft. area would be set aside for permanent tree cover. Also the upper watershed area must be addressed to determine what action is necessary to protect against encroachment from further land clearing and tree cutting for charcoal production. This could involve afforestation of the higher elevations above the gully. Cost of this activity is estimated to be US\$20,000.

#### c. Hope

The gully in this area is a tributary of the St. George's Ghaut, and is located above Tabernacle Village with its source near Verchilds Mountain. The gradient of the gully is steep, 11 to 23 percent in the area selected for treatment (a 23 percent gradient is a verticle drop of 23 feet in the terrain for every 100 ft. horizontally). The bottom of the gully is composed of a loose sandy material with a few boulders at irregular intervals. The side slopes are virtually vertical and are composed of the same material as that found in the gully bed. There is no vegetation in the bed but some vegetation including a few trees on the side slopes. Sugarcane and other cultivation extends to the edge of the gully.

The area under consideration for the Project begins approximately at the 550 ft. contour and extends to the 200 ft. contour. The total length of the gully is about 1700 ft. on the slope. The section begins at the agricultural road culvert at about an 11 percent gradient. There is a vertical drop of 12 ft. at this location. The first 800 ft. of the top portion of the gully has a gradient varyiny between 15 to 23 percent.

Downslope, past this point the gradients become uniform varying between 15 to 17 percent until the gully enters the St. George's Ghaut. There is a 6 inch diameter water main crossing the gully approximately 300 ft. from the culvert. The old water main which was located a short distance downstream was abandoned due to the crossing being destroyed by the water flows in the gully. The width of the gully in this section varies between 20 to 50 ft.

The gravelly sandy soil type of the gully allows severe downcutting and sideslope failures. Contributing to this problem is the continued practice of cutting trees in the gully for charcoal production.

The downcutting of the bed of the gully has reached severe proportions. The old agricultural road crossings have steadily caved in and the road has progressively been located further upstream. At present in an attempt to stabilize the situation, NACO has constructed a twin pipe culvert. However, though some stability has resulted in the immediate vicinity of the culvert the downcutting process has continued to the extent that a 11 ft. drop now exists about 120 ft. from the culvert. If nothing is done the culvert will be destroyed in a few years time and an entire agricultural area will be isolated. In addition, erosion threatens the sides of the gully near the location of the currently used water main supplying four villages. Further degradation in this area will result in the collapse of the water main.

The average gradient of 17 percent in the gully is too high. The ideal gradient would be one of 3 percent. However, to modify the gully to this ideal slope would involve constructing 4 ft. falls at 25 intervals for the entire 1700 ft. length and would be an extremely costly solution. A compromise action which will provide a medium term solution to the problem and holds promise for permanently stabilizing the gully is the following:

(a) construct a concrete fall or shute at the 11 ft. drop and stop further deterioration at this point;

(b) construct a concrete drainage channel about 20 ft. wide with sidewalls about 5 ft. high and hydraulic jumps at 20 ft. intervals to slow down the velocity of the water; and

(c) the existing channel of Hope gully to St. George's gully is unsatisfactory (right angled exit). Therefore, strengthen the exit and add a concrete bell shaped outlet with hydraulic jump.

Total costs of this work are estimated at approximately US\$473,400.

An alternative to this work is to carry out a detailed study of this gully.

A shelter belt of trees will be required in the gully bed on both sides of the concrete channel and on the banks of the gully in the lower and upper areas. Some protection of the upper watershed may be required. The costs of this work are estimated at approximately US\$20,000.

ST. KITTS-NEVIS RESOURCE MANAGEMENT PROJECT

BUDGET

(\$000 omitted)

	TOTAL	FX	LC
A. <u>Technical Assistance</u>			
1. Project Coordinator 27 months at \$10,600/mt.	287	287	
2. Nevis consultant 12 months at \$10,600/mt.	128	128	
3. Short-term expertise 8 months at \$10,600/mt.	85	85	
4. Local Hire			
a. Soil Conservationist 27 months at \$833/mt.			
b. Ag. Forester 27 months at \$833/mt.			
c. Surveyor 6 months at \$833/mt.	<u>50</u>	<u>    </u>	<u>50</u>
Sub-Total (A)	550	500	50
B. <u>Training</u>			
1. U.S. short-courses 6 courses at \$9,000/ea.	54	48	6
2. In-country			
a. Equipment Operation two weeks	11	11	
b. Conservation four weeks	25	20	5
Sub-total (B)	<u>90</u>	<u>79</u>	<u>11</u>

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C. Commodities

1. Bulldozers			
two at \$150,000/ea.	300	300	
2. Project Vehicles <u>a/</u>			
two at \$15,000/ea.	30	30	
3. Surveying and Monitoring <u>b/</u>			
two sets at \$10,00/ea.	20	20	
4. Agricultural Inputs			
160 acres at \$350/acre	56	50	6
	—	—	—
Sub-Total (C)	406	400	6

D. Other

1. Gully Stabilization	469	269	200
2. Field Terracing			
135 acre at \$926/acre	125	-	125
3. Shelterbelt			
120 acre at \$500/acre	60	-	60
4. Sub-Project Activities	150	20	130
	—	—	—
Sub-total (D)	804	289	515

E. Contingency	150	100	50
	—	—	—
Total (A-E)	2,000	1,368	632
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a/ operational expenses to be included in TA contract.

b/ automation equipment for plotting, if required, to be included in TA contract.

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