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

CARIBBEAN REGIONAL

PROJECT PAPER

AGRICULTURAL DEVELOPMENT

AID/LAC/P-179

Project Number:538-0101

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT DATA SHEET				1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete <input checked="" type="checkbox"/> A		Amendment Number _____		DOCUMENT CODE 3			
2. COUNTRY/ENTITY Regional Development Office/Caribbean				3. PROJECT NUMBER <input type="text" value="538-0101"/>							
4. BUREAU/OFFICE Latin America and the Caribbean (LAC)				<input type="text" value="05"/>		5. PROJECT TITLE (maximum 40 characters) St. Vincent Agriculture Development Project					
6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY <input type="text" value="1"/> <input type="text" value="2"/> <input type="text" value="3"/> <input type="text" value="0"/> <input type="text" value="8"/> <input type="text" value="6"/>				7. ESTIMATED DATE OF OBLIGATION (Under 'B' below, enter 1, 2, 3, or 4) A. Initial FY <input type="text" value="84"/> B. Quarter <input type="text" value="3"/> C. Final FY <input type="text" value="86"/>							
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)		(1,700)	(300)	(2,000)	(1,700)	(300)	(2,000)				
(Loan)		()	()	()	()	()	()				
Other U.S.	1.										
	2.										
Host Country			110	110		209	209				
Other Donor(s)			70	70		145	145				
TOTALS		1,700	480	2,180	1,700	654	2,354				
9. SCHEDULE OF AID FUNDING (\$000)											
A. APPRO- PRIATION	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	210	010			2,000		2,000				
(2)											
(3)											
(4)											
TOTALS					2,000		2,000				
10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 050 075								11. SECONDARY PURPOSE CODE 100			
12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)											
A. Code		BS		R/AG							
F. Amount		700		200							
13. PROJECT PURPOSE (maximum 480 characters) <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">To increase productivity of small holder agriculture and improve marketing efficiency for commodities produced in these systems.</p> </div>											
14. SCHEDULED EVALUATIONS						15. SOURCE/ORIGIN OF GOODS AND SERVICES					
Interim		MM YY <input type="text" value="0"/> <input type="text" value="7"/> <input type="text" value="8"/> <input type="text" value="5"/>	Final		MM YY <input type="text" value="0"/> <input type="text" value="7"/> <input type="text" value="8"/> <input type="text" value="6"/>	<input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) _____					
16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)											
17. APPROVED BY		Signature William B. Wheeler				Title Director		Date Signed MM DD YY <input type="text" value="0"/> <input type="text" value="6"/> <input type="text" value="2"/> <input type="text" value="5"/> <input type="text" value="8"/> <input type="text" value="4"/>		18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY	

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PROJECT AUTHORIZATION

NAME OF COUNTRY: St. Vincent and the Grenadines
NAME OF PROJECT: Agricultural Development
NUMBER OF PROJECT: 538-0101

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Agricultural Development Project for St. Vincent and the Grenadines (the "Grantee") involving planned obligations of not to exceed Two Million United States Dollars (\$2,000,000) in grant funds ("Grant") over a thirty 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 two years and six months from the date of obligation.

2. The Project ("Project") consists of assisting the Grantee in its program to increase the productivity of small holder agriculture and improve marketing efficiency for commodities produced in these systems. This will include financing activities and support facilities in the areas of technology generation and application, marketing, and data gathering and analysis.

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. Vincent 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. Vincent 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 the 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; and of any additional representatives, together with a specimen signature of each person specified in such statement; and

(c) Evidence that, during the life of the Project, the St. Vincent Marketing Corporation or any other government agency will not restrict or otherwise place constraints upon, the exportation of peanuts, carrots, and sweet potatoes from St. Vincent through the establishment of regulations, rules, procedures, etc., regarding the issuance of licenses or any other means whereby exports may be affected;

(2) Disbursement for Technology Generation and Application

Prior to any disbursement under the Grant, or to issuance by A.I.D. of documentation pursuant to which disbursement will be made for the Technology Generation and Application Component of the Project, 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) Evidence that the Ministry of Trade and Agriculture has made available four acres of land or other suitable facilities to conduct varietal trial selection during the life of the project. This acreage shall be in addition to that which is available at the Camden Park Research Station; and

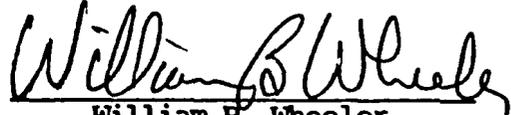
(b) Evidence that Memoranda of Understanding have been signed between the Ministry of Trade and Agriculture on the one hand, and the Caribbean Agricultural Research and Development Institute (CARDI), and the Organization for Rural Development on the other. These Memoranda shall detail the role and responsibilities of each organization in implementing the Project.

(3) Disbursement for Marketing

Prior to any disbursement other than technical assistance under the Grant, or to issuance by A.I.D. of documentation pursuant to which disbursement will be made for the Marketing Component of the Project, 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) Evidence that a Memorandum of Understanding has been signed between the Ministry of Trade and Agriculture and the St. Vincent Marketing Corporation detailing the role and responsibilities of each organization in relation to implementing this component of the Project; and

(b) Evidence that the St. Vincent Marketing Corporation holds the title to the land adjacent to its building in Kingstown and that it has the legal right to construct a permanent building on that site.



William B. Wheeler
Director, Regional Development
Office/Caribbean

25 June 1984
Date

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PROJECT PAPER

ST. VINCENT AGRICULTURAL DEVELOPMENT

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AID	Agency for International Development
AMP	Agricultural Marketing Protocol
BDD	British Development Division in the Caribbean
CARDATS	Caribbean Agricultural and Rural Development Advisory and Training Services
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community (Also Caribbean Common Market)
EDF	European Development Fund
EEC	European Economic Community
FAO	Food and Agriculture Organization of the United Nations
GOSV	Government of St. Vincent and the Grenadines
NDB	National Development Bank
MTA	Ministry of Trade and Agriculture
OAS	Organization of American States
ORD	Organization for Rural Development
PACD	Project Assistance Completion Date
PID	Project Identification Document
PP	Project Paper
RDO/C	Regional Development Office/Caribbean
RFP	Request for Proposals
RFQ	Request for Quotations
UWI	University of the West Indies
W.I.	West Indies
WINBAN	Windward Islands Banana Growers Association

II. PROJECT BACKGROUND AND RATIONALE

A. Economic Setting

St. Vincent and the Grenadines similar to other small island economies of the Eastern Caribbean, experiences the problems of 1) diseconomies of scale in producing for small domestic markets; 2) heavy reliance on a few exports, especially bananas, for which a protected market exists abroad; 3) vulnerability to international economic disturbances; 4) high per capita cost of the heavy infrastructure needed for economic growth; 5) high transportation and communication costs; 6) declining aid flows from the United Kingdom since independence in 1979; and 7) a high emigration rate of professional and skilled labor. In 1981 St. Vincent enjoyed a brief economic expansion. Banana production made a good recovery in the wake of the La Soufriere volcano eruption in 1979 and Hurricane Allen a year later; and continued growth of manufacturing activity -- an outgrowth of the country's effort to promote economic diversification -- contributed to the expansion. Prior to this, in 1976 - '78, the country had fared remarkably well, achieving average annual increases in real output of 9 percent. In 1982, however, the economy exhibited signs of a slowdown with GDP growing by only 2.3%. The slowdown reflected weak performance in agriculture as a result of a drought in the early part of the year (banana production declined 7% from the previous year), and a decline in tourism. With a per capita GNP of \$690 and an unemployment rate estimated at 20 - 25%, St. Vincent remains one of the least developed of the Eastern Caribbean island states.

B. Agriculture Sector

St. Vincent's economy is largely based on agriculture and, although the relative importance of this sector has declined some in recent years, it still accounted for an estimated 25% of the island's export earnings and 17% of GDP in 1982. (See Table 1).

One-third of the total land area in St. Vincent and the Grenadines is classified agricultural land of which 22 percent is cultivated. Most of the farms (78%) are under five acres in size. The remaining 22 percent, however, account for around three-fourths of the arable land. In other words, most of the farmers in St. Vincent are small farmers, but the majority of agricultural land is relatively concentrated in private or governmental estates. Of the five government estates, two are undergoing a redistribution and settlement scheme, with 30 year lease terms.

Land tenure in St. Vincent is interrelated with both farm efficiency and geographic location. A land tenure map shows large private and government estates on the coastal, more gently sloping areas while smaller holdings are most frequently located in the interior, or more rugged boundaries of the estates. In portions of the mountainous interior crown lands are occupied by squatters. Own-account or family lands are found throughout St. Vincent and the Grenadines and are reported to be the most efficient in use of available resources. Estate farms which depend heavily on hired labor are generally believed to be less efficient. According to the 1972 census, the greatest proportion of holdings were owned (68%), following by rent free (13%), cash rental (10%), mixed tenure (3%) and share tenancy (4%).

TABLE 1

ST. VINCENT AND THE GRENADINES - SECTORAL ORIGIN OF GROSS

DOMESTIC PRODUCT AT CONSTANT FACTOR COST, 1977-82^{1/}

(In million of 1977 East Caribbean dollars)^{2/}

	1977	1978	1979	1980	1981	Est. 1982
Agriculture	13.3	16.0	13.1	11.3	17.2	17.4
Quarrying	0.3	0.3	0.3	0.3	0.3	0.3
Construction	10.0	9.9	10.8	11.3	12.1	12.7
Manufacturing	5.9	8.6	9.7	10.5	11.5	12.0
Electricity and Water	2.4	2.5	3.1	3.2	3.4	3.6
Transport and Communications	11.5	13.2	15.4	16.5	18.5	19.0
Wholesale and Retail Trade	10.4	10.0	10.2	10.4	10.8	11.1
Hotel and Restaurants	1.4	1.7	1.9	2.0	1.9	1.8
Banking, Finance, Real Estate & Business Services	6.1	7.8	7.1	7.3	7.6	7.8
Public Administration	15.4	16.1	17.0	17.7	18.1	18.1
Other Services	2.6	2.9	3.1	3.2	3.3	3.3
GROSS DOMESTIC PRODUCT AT FACTOR COST	<u>79.3</u>	<u>89.0</u>	<u>91.7</u>	<u>93.7</u>	<u>104.7</u>	<u>107.1</u>

^{1/} Source: "St. Vincent and the Grenadines Economic Situation and Medium-Term Prospects", 1983, World Bank.

^{2/} US\$1 = EC\$2.66

By far the largest crop - both in terms of production volume and foreign exchange earnings - is bananas (See Table 2). This has been the dominant crop for almost twenty years (with export volumes at approximately 30,000 tons/year) and accounts for 40% of total domestic export value. Virtually all the crop is sold on the British market under a preferential marketing agreement. Prices received by banana growers have recently declined sharply due to the depreciation of sterling. In the longer term, the arrangement under which bananas from the Eastern Caribbean are imported into the protected U.K. market may be subject to modification. Four other agricultural commodities accounted for another ten per cent of total domestic export value as of 1981: arrowroot, coconut, sweet potatoes and spices (nutmeg, mace and ginger). In 1983, however, St. Vincent lost its principal arrowroot market, the U.S., due to a combination of more competitive prices for Brazil arrowroot and the use of cheaper alternative starches by previous users. As a result, 95% of St. Vincent's 1982 crop remained unsold. The production of coconuts, another export crop, had also decreased, due primarily to the combined effects of the natural disasters and disease infestations, but appeared to be increasing again in 1982.

Sugar cane production virtually ceased after the closing of the processing factory in 1962 with the result that by 1979 St. Vincent was spending \$1 million for sugar imports. The crop was reintroduced in 1980 with the intention of reducing, or replacing entirely, the need for imported sugar. The 1982 crop yielded nearly 1,800 tons of sugar, approximately half the amount imported in 1979.

During the past ten years there has been increased emphasis in St. Vincent on the production of ground provisions, fruit and vegetables in an effort to decrease the food import bill. Although the annual production of most of the vegetable and root crops is sufficient for domestic needs, the distribution throughout the year is poor. Grown primarily by the small farm holders, the food crops are typically produced without herbicides, insecticides, or organic fertilizers. While some farmers use chemical fertilizer, often obtained through the Banana Association, the fertilizer is usually not optimal for vegetable or root crop production. Harvesting of the crops is done primarily through family labor although both family and hired labor is often used for planting, weeding, and tillage chores.

Sweet potatoes, yams, dasheen, tannias, eddoes, and ginger are the most important root crops grown. Sweet potatoes are probably grown by more farmers than any other crop. Many of the potatoes are exported to Trinidad. Ginger is a fairly recent export crop which, like many of the crops, is struggling to balance production with markets. In a recent year, about half of the ginger crop was reported to be not harvested because of marketing problems.

TABLE 2
ESTIMATED PRODUCTION OF MAJOR AGRICULTURAL
CROPS IN 1980 - ST. VINCENT

<u>Commodity</u>	<u>Quantity</u>	<u>Value in EC\$</u>
Bananas	46,144,737 lbs	21,400,000
Coconuts	10,737,882 nuts	3,220,000
Eddoes	4,030,625 lbs.	2,620,000
Arrowroot Starch	10,000 brls.	1,995,000
Sweet Potatoes	4,652,385 lbs.	1,721,000
Plantains	3,231,200 "	1,130,920
Tannias	1,500,000 "	940,000
Ginger	1,200,000 "	840,000
Mangoes (est.)	1,269,000 "	793,000
Yams	1,000,000 "	750,000
Tobacco	190,000 "	666,400
Cocoa bean (est.)	-	465,920
Carrots	900,000 "	450,000
Nutmeg	392,510 "	431,000
Dasheen (est.)	1,000,000 "	350,000
Peanuts	100,000 "	300,000
Breadfruit (est.)	720,000 no.	216,000
Mace	78,500 lbs.	133,000
Limes (est.)	300,000 "	100,000
Avocado	95,536 "	34,000

SOURCE: "St. Vincent and the Grenadines Economic Situation and Medium-Term Proposals", World Bank, 1983.

TABLE 3

ST. VINCENT AND THE GRENADINES - ESTIMATED PRODUCTION

OF AGRICULTURAL COMMODITIES, 1977-82

(In thousands of pounds, unless otherwise indicated)

	1977	1978	1979	1980	1981	Est. 1982
Arrowroot starch	1,487	1,838	1,493	1,562	1,616	2,110
Bananas	63,000	71,934	63,028	46,145	73,240	67,924
Carrots	758	904	638	900	400	N/A
Coconuts ('000) nuts)	12,000	16,000	14,296	10,738	9,924	10,519
Eddoes	3,000	4,395	3,299	4,031	6,029	6,391
Ginger	1,321	1,915	2,635	1,200	2,000	2,120
Mangoes	3,810	3,809	3,810	1,269	3,810	4,039
Onions	-	-	-	-	-	110
Peanuts	56	151	101	100	400	424
Plantains	926	1,830	2,411	3,231	11,200	11,872
Sugar	-	-	-	-	N/A	3,876
Sweet Potatoes	1,686	3,493	3,200	4,652	3,016	3,197
Tannias	1,494	1,900	1,500	1,500	1,500	1,500
Tobacco	28	84	161	190	218	219
Yams	1,310	1,000	1,000	1,000	1,000	1,000

Source: Central Statistical Unit, Ministry of Finance, December 1982.

N/A = Not available.

The main vegetables grown in St. Vincent include cabbage, cauliflower, melons, pumpkins, cucumbers, lettuce, eggplant, tomatoes, peppers, beans, and ota. The first commercial onion crop was harvested in 1982. A high demand for such vegetables exists both locally and regionally, but their production is highly seasonal.

St. Vincent began to produce carrots for export in 1969. A market of at least 80,000 pounds was assured under CARICOM's guaranteed market scheme. Carrot production for export increased from 8,000 pounds in 1969 to 1.5 million pounds in 1974. Since 1976, however, carrot production has declined to around one-third of its 1.8 million 1976 level. Carrot exports' in 1979 was less than one-fourth of the 1976 export levels. Blights, nematode infestations, crown rot and leaf spot have been blamed for the production decrease. Prices near or below production costs are also thought to have caused the reduction.

A regional market for peanuts exists. Only around 160 acres of land were under peanut production in 1975, most in the drier southwestern area. In that year production peaked at 94 tons, but fell to 20 tons just two years later. Since then the emphasis on bunch varieties and improved agronomic practices by CARDI, CARDATS, and ORD has fostered increased planting of the ground nuts, and annual production now stands at about 50 tons.

A variety of market outlets are used by the farmers of St. Vincent. Some crops are sold directly to the consumer, either at the farm or at the central market. Other market outlets include hucksters and traffickers who purchase crops from the farmers for domestic and regional resale; the St. Vincent Marketing Corporation (SVMC), a statutory agency; Eastern Caribbean Agency (a private agency), and producer associations (banana and arrowroot).

The St. Vincent Marketing Board was officially established under the Marketing Board ordinance of 1959. In 1975 the Board was reconstituted as the St. Vincent Marketing Corporation and charged with acting on behalf of the Government as importer of commodities, and stimulating, facilitating, and improving the production, marketing and processing of produce particularly for the benefit of the producer. This is accomplished through three rural purchasing depots and a storage/marketing complex in Kingstown. Goods are sold at a low mark-up to provide competition to other food retailers for controlling inflation.

The SVMC has demonstrated significant growth in its food import, wholesale and retail operations, and has established a record of financially self-sustaining trade in imported commodities. Export trading in fresh produce has been less impressive, showing a decline in volumes over recent years which in general have resulted in financial losses.

C. Constraints

Two fundamental problems seem to characterize agriculture in St. Vincent. The first problem is that agricultural production and distribution are relatively high cost activities. High risks in production and marketing constitute the second problem.

The high cost argument is that per unit cost of producing and distributing agricultural products to the final consumer are relatively high compared to imported agricultural products or costs of competitors for export markets. Evidence of this problem can be found in the following situations:

1. banana exports to the U.K. not being competitive without preferential treatment;
2. arrowroot export markets being threatened with cheaper starches including arrowroot starches from other countries;
3. meat imports being cheaper than those locally produced;
4. sweet potato and carrot export quotas being unfilled; this may be because the established price does not induce farmers to produce additional quantities needed; and
5. labor being reportedly unavailable at wages farmers can pay.

The basic reasons for high per unit production and distribution costs are relatively low yields, difficult terrain for movement of products, small market quantities for handling and assembly efficiencies, and high per unit shipping charges to export markets. Specific data for documentation of these assertions are not easily available. Nevertheless, the low use of yield increasing inputs such as appropriate fertilizer, the lack of specific high yielding crop varieties adapted to St. Vincent, and high labor costs would imply high per unit production costs. Numerous but small collection points faced by hucksters, poorly maintained roads, high gas prices and poorly equipped shipping vessels imply high per unit distribution costs.

The second fundamental problem is the high risks involved in production and marketing. The existence of these risks is also difficult to ascertain with available data. However, the following situations tend to support the notion:

1. a wide diversity of crops grown during one year by farmers;
2. widely fluctuating prices supposedly received by farmers within one year and among different years;
3. natural disaster occurrences;
4. lack of information on the part of farmers about current, as well as expected prices;
5. lack of storage for smoothing price and quantities available;
6. lack of information by buyers of expected production of commodities; and
7. development of other income sources by farm families.

An example of the substantial uncertainty faced by market persons trying to make future commitments to foreign markets is illustrated by data that show peanut, ginger, carrot and sweet potato production changed, from one year to the next, on the average of 39 percent or more over the period 1971-81. These very large changes in annual production indicate that farmers are either actively searching for profitable crops or facing large price variations or experiencing substantial production risks such as disease or natural disasters.

The results of the high risk agriculture included an aversion by farmers to invest in productivity increasing technical inputs or concentrate their production in fewer crops and thereby gain the advantages of specialization. Risk also decreases farmers ability to meet commitments on future deliveries and makes market intermediaries reluctant to hold title to large quantities of produce.

The solutions to these problems involve development of an array of capabilities in both the public and private sectors including research, extension, information systems and physical infrastructure. Many of the solutions to these problems will require sustained and long-term investment for facilities, institutions, as well as improving human capital.

Underlying the two fundamental problems of St. Vincent Agriculture discussed above are a host of specific constraints relating to policy, production technology, institutional support, education, markets, infrastructure, and natural resource endowment. The relative importance and attributes of these specific constraints vary according to the commodity considered. For example, in bananas constraints related to infrastructure and resource endowment are

probably more important than most of the other constraints listed. On the other hand, constraints to commercial vegetable production are more related to problems of production technology and marketing. The point is that a thoughtful analysis reveals no dominant constraint that is singularly impeding agricultural sector growth in St. Vincent. Instead, there are a number of bottlenecks in each commodity channel the solutions to which require simultaneous attention within a coordinated approach.

D. Proposed Approach

Agricultural production in St. Vincent and the Grenadines involves a wide range of commodities, none of which are produced on a sufficiently large scale to command a secure place in regional and world markets. In addition, the production and marketing sectors are not well integrated in terms of information flows. As a result, marketers and producers are faced with a high degree of uncertainty with respect to levels of production, demand and price. In addition, and in part as a function of scale of production, the unit costs incurred in the production and distribution processes are relatively high. These high costs, of course, add to the difficulties of competing in the export and import substitution market place. In order to work toward breaking out of this vicious cycle, an integrated approach is proposed.

The proposed approach has three elements. First, four commodities with strong market potential are identified. The approach is thus strongly market oriented. Second, activities will be undertaken to bring available technology and expertise to bear on the marketing and production of the food commodities, and adapt the technology to local conditions. The objective of these activities is to solve commodity specific production and marketing problems, minimize per unit costs, and thus enhance net returns to the producer. Third, and finally, planning, implementation, and monitoring capability will be institutionalized in the Ministry of Trade and Agriculture. The immediate purpose of this third element is precisely to assist in implementing the marketing and production elements of this project by providing reliable and relevant management and information.

A longer run purpose, however, is to enhance the capability of the agricultural sector to adapt more quickly as once viable commodities lose ground and others must be introduced. The support given to improving management and information generation will allow the MTA to more effectively utilize existing resources as well as agricultural assistance provided by external donors. Moreover, this increased capacity will enable St. Vincent to maintain the more flexible stance required for coping with changing conditions over the long-run.

The integrated approach described above bears many similarities to specific programs now in place. Integrated marketing, production, and input supply activities are familiar in banana and arrowroot production. Building on the familiar has appeal in its own right. It should enhance the chances of success. By the same token, however, the current uncertainty with regard to the arrowroot industry illustrates well the need for continuous adaptation to changing markets or other conditions.

E. Project Issues

Issues identified in the PID Guidance Cable (see Annex VIII, Exhibit A) are discussed below.

1. Use of the Private Sector

The Guidance Cable urged that the private sector be responsible for implementing as many of the components as possible. The Project design incorporates this guidance.

A variation of the ALCOSA and BAT models of introducing and disseminating technology has been chosen. Whereas ALCOSA and BAT both are buyers and manufacturers of raw agricultural commodities, in this Project the Organization for Rural Development (ORD) will perform the role of intermediate buyer not unlike typical producer's associations. ORD sustains its operations through the use of volunteers and part-time paid staff. ORD presently has supply contracts for ginger, yams and peanuts with large private agricultural trader, Eastern Caribbean Agencies, Ltd. By performing as a primary rural purchase and assembly agent, ORD is able to gain a modest margin that contributes to sustaining its operations. The Project will also utilize traditional GOSV research and extension capabilities and will leverage the AID regional projects in research and extension. The private sector best complements the public sector in this area when situations arise where: a) profits can be captured; b) good-will exists on the part of development minded organizations; or c) producers group together to finance common services.

2. Monopsony Role of SVMC

The termination of the monopsony for carrots, peanuts and sweet potatoes has been agreed to in principle by the Ministry of Agriculture and Trade, and has been made a condition of AID assistance under this Project. The SVMC has agreed to increase its services to private traders to facilitate maintenance of quality and increased

efficiency on the movement of agricultural commodities. Among the services to be provided by the SVMC are: a) provision of packing boxes and material on a fee basis; b) development and publication of a market price information; and c) rental of short-term storage space.

3. Credit Through Private Banks

With regard to implementing the credit component through the existing private banking system, the Project design team elected to use the credit in-kind system already operated by ORD. Use of private banks would involve subsidising their administrative overhead to allow processing, over the life of the Project, of approximately 1,500 small farmer loans ranging from US\$100 to US\$300 each. These banks also have a strict collateral requirement that most farmers cannot meet, and loan procedures that are too complex for the small loans typically required.

4. Sustainability of the Credit Program

The National Development Bank (NDB) will not be the agent of the credit system, rather ORD will expand its present loan program to include the credit requirements for the Project. The credit component of the Project has been cut back substantially from \$500,000 suggested in the PID, in part to match the capabilities of ORD. ORD has successfully undertaken a small farmer loan scheme and has experienced a 90 percent loan recovery rate. According to ORD's latest audit, completed in 1983, its loan procedures and monitoring system are adequate to maintain a continuation of a credit program.

5. Design of Credit Mechanism

The loan application procedures, with ORD, will remain the same as those used in its existing program. This consists of a simple one page Agreement describing the transaction, the payback date, charges and interest. AID approval of funding of the inputs for use in the credit program will be dependent on ORD coordination with the Extension Unit and CARDI. The ORD application proposal to Ministry of Trade and Agriculture (MTA) will be reviewed by, among others, the Extension Unit and the Project Coordinators and the latter will solicit a response from CARDI. The proposal must detail the planned coordination. To date, these groups have worked well together complementing the activities of each other. Additionally, the ORD structure is a private sector variant of an agricultural extension service and the credit mechanism will be integrated into ORD's overall activities.

6. Socio-Economic Analysis

During the preparation of the Social Soundness Analysis by a sociologist the agricultural sector was considered vis-a-vis the Project design. Although secondary data are not available to sexually differentiate consumption patterns and division of labor among the small farmers, the analysis identifies no adverse impact on women. On the contrary, the design of the Project favors full participation by women. Women are an integral part of ORD and therefore should have full access to participation in the production component of the Project. The Marketing Component of the Project will benefit primarily women since a majority of the traders are women. The Data Gathering and Analysis Component will generate fuller information on women's roles in agriculture and marketing through the census and through follow-on special studies.

F. GOSV Policy

The Government of St. Vincent and the Grenadines is concerned about the problems facing the agriculture sector and has directed its efforts towards strengthening the small farm subsector, increasing agricultural production and foreign exchange earnings from a diversified base, and improving extension services and marketing channels for agricultural products. Traditional efforts to boost export earnings have centered around increasing production of bananas and arrowroot. While continuing activities in this area, the GOSV has also tried to stem the outflow of foreign exchange through import substitution of essential agricultural commodities, e.g. self-sufficiency in sugar. Supportive of both these approaches is the diversification in agricultural production, particularly in food crops, both for the purpose of ensuring a reliable supply of these commodities for domestic consumption as well as for sale in the intra-regional market.

The Project proposed here is consistent with the overall thrust of GOSV agricultural policy. In particular, the GOSV will utilize AID assistance to encourage greater individual farmer productivity, facilitate private sector traders, expand export volumes, and gain greater benefits for currently available resources in national and regional institutions. The methods selected to implement that Project build on the successful experience in the past of commodity specific emphasis. Four commodities with high market potential have been selected for emphasis. Hence, the GOSV will modify the current St. Vincent Marketing Corporation's export licensing requirements for these commodities and provide services to stimulate export volumes through private traders. Simultaneously, the GOSV will direct research, extension and planning resources to concentrate on improving production and coordination of these same

four commodities. Likewise, a small but innovative credit-in-kind activity for inputs will be implemented for specific commodities through a non-Governmental farmers organization.

In this way, the GOV expects to achieve significant incremental gains in a few targeted commodities without disruptive organizational or policy changes that are needed to support other subsectors of the agricultural economy.

In addition to its own resources, the GOSV has received help from international donors primarily in banana and sugar cane development (United Kingdom and CDB respectively) and construction of agricultural feeder roads, another CDB project. The only donor assistance being provided in the area of vegetable and root crop development is a relatively small vegetable project being carried out with Taiwan's personnel.

G. AID Strategy

The strategic objectives of RDO/C's agricultural program are to increase the per capita output of food and other marketable commodities and to expand employment opportunities for rural families, thereby increasing farm family incomes. The proposed bilateral project in St. Vincent will contribute to this objective.

The Country Development Strategy Statement, dealing with agriculture, also describes RDO/C's intention to emphasize two parallel areas of concentration: (a) increasing traditional export commodities to achieve an immediate impact on employment, incomes, and foreign exchange earnings; and (b) promoting commercial agricultural diversification to achieve greater food production for regional requirements and establishing new commodities aimed at extra-regional markets. This dual focus remains valid and is reflected in this bilateral project for St. Vincent.

RDO/C's ongoing projects to implement the agricultural strategy noted above include regionally based assistance to CARDI for agricultural research, to UWI for improved extension services, and to the CDB for agricultural credit. The St. Vincent bilateral Project proposed here builds on the achievements of these ongoing Regional AID projects, and is designed purposely to complement those projects by addressing certain national problems that experience has shown to be necessary. In fact, the basis for commodity selection, the proposed relationships among implementing institutions, and activities to be undertaken in this Project flow primarily from the information and experience gained in ongoing RDO/C projects.

The four fundamental precepts of AID policy are also reflected in this Project design. Technology transfer is a prominent feature of the Project and involves screening and adaptation of improved varieties of planting material, provision of services and facilities to reduce postharvest losses, and greater access to production inputs. Policy constraints have been explicitly reviewed and modifications are planned where believed necessary and prudent, as for example the Marketing Corporation relinquishing its export monopsony position on three of the commodities selected for emphasis in the Project. Related to policy, the Project includes specific actions and services to encourage private sector entrepreneurs in production, input supply, and marketing activities. Finally, the Project supports specific activities to enhance institutional capability in both the public and private sectors. The priority concern to which institution building elements are directed is achieving greater utility from current Governmental units of the GOSV as well as the regional institutions servicing the GOSV. In particular, the capabilities of the statistical unit on the MTA will be provided with substantial technical assistance and equipment to conduct an agricultural census and to routinely perform basic data gathering functions; the MTA Research Unit and Extension Unit will be supported to assume a more directive role in planning and monitoring the activities of CARDI, UWI Extension Faculty, CARDATS and other regional service organizations.

III. PROJECT DESCRIPTION

A. Project Goal and Purpose

The Project goal is to increase net incomes of small farmers and increase foreign earnings from agricultural exports.

The purpose is to increase productivity of smallholder agriculture, and improve marketing efficiency for commodities produced in these systems.

B. End of Project Status, Outputs and Inputs

1. End of Project Status

By mid-1986 the annual volume and value of carrots, sweet potatoes, peanuts, and onions produced and marketed by Vincentian farmers will have increased significantly over current levels. Gross cash incomes to farmers producing these four commodities will increase from current totals of about US\$600,000 to at least US\$1,000,000 annually. Moreover, farmers involved in these commodities will know the technology and have access to required inputs so that these levels of productivity can be sustained over time.

By the end of the Project, a majority of the export sales volumes of the four targeted commodities will be accomplished by independent traders, either individuals or farmer groups. The Government owned St. Vincent Marketing Corporation will relinquish its current monopsonistic position for export trade in carrots, sweet potatoes, and peanuts, and expand its services to assist private traders and farmer organizations in an effort to maintain post-harvest produce quality and encourage profitable use of consistent grading and packing standards. As a result of the inherent initiative of private traders in combination with the SVMC provision of quality enhancing services, selected Vincentian commodities will enjoy an improved reputation for value and gain a larger share of available Regional markets.

The utilization of a commodity specific approach employed by the Project will provide a practical model for the GOSV institutions to better direct the services and resources available from regional institutions, e.g. CDB, CARDI, CARDATS, UWI Extension, etc. Moreover, specific Project activities in data collection, analysis, and special studies will provide GOSV decisionmakers with an increased understanding and more objective basis for implementing development investments in the agricultural sector.

2. Outputs

The Project will fund activities to achieve the following specific outputs.

a. Technology Generation and Application

The Project will enable the GOSV to better utilize the services of CARDI, UWI, and other regional institutions so that the "best varieties" of carrots, sweet potatoes, peanuts, and onions available from the U.S.A., Puerto Rico, and the International Research Centers will be tested under conditions in St. Vincent. Up to 12 non-traditional varieties of each targeted commodity (48 in total) will be screened for yield, market quality, post-harvest perishability, and field husbandry requirements. It is expected that more productive and more profitable planting material can be identified for general use in each commodity. As part of this variety screening activity, economically optimum levels of fertilization and other field husbandry practices will be identified through a farming systems research approach.

The Project will assist a non-Governmental farmers' organization establish input sales and distribution services. Seeds, fertilizers, and pest control inputs with a value of up to US\$100,000 will be distributed as credit-in-kind by the Organization for Rural Development with payment reflows restricted to repeated input procurement for follow-on crops. Thus the Project will establish a modest and innovative addition to agricultural credit in St. Vincent, which is particularly well suited to the small food crop farmer.

b. Marketing Services

The Project will finance the construction of a short-term produce storage facility covering about 10,000 ft² near the port in Kingstown. As a result, private export traders will, for the first time, be offered the opportunity to rent a secure location to place their produce out of the direct sun while waiting for arrival and loading of ships.

The Project will also support the establishment of a pilot facility to store sweet potatoes for periods up to 5 months. Development of cost effective sweet potato storage would enable more orderly export marketing and assist to mitigate the large fluctuations in volumes and prices now associated with highly seasonal production.

In addition to the short-term produce storage facility, which will be operated by the St. Vincent Marketing Corporation, the Project will assist the SVMC to inaugurate three additional new services aimed at assisting private traders profitably increase their trading volumes. First, the Project will assist the SVMC to stock an array of boxes, cartons, and bags designed specifically for fresh produce and sell these items to traders on a cash basis. Second, the Project will fund the services of a fresh produce trade expert for a period of two years. This expert will work directly with individual private traders and farmers' groups to: i) identify profitable opportunities for establishing consistent sorting and quality standards; ii) identify profitable opportunities for utilizing improved packing materials; and iii) promote forward supply contracts between farmers and buyers. Third, the Project will support the SVMC to monitor and publicly report selling prices of selected commodities on a weekly basis. Thus, the Project will establish the rudimentary elements of a market price information system, which will be initially geared toward monitoring the market prices of the four targeted commodities.

c. Agricultural Sector Data Gathering and Analysis

The Project will fund the execution, analysis, and publication of a national agricultural census. While this output is considered an important priority, of at least equal utility will be the output of establishing the capability within the MTA to routinely monitor and forecast production of selected crops. Therefore, utilizing the sampling frame and other techniques developed for the census activity, the MTA Statistical Unit will have the capability as a result of the Project to forecast the areas planted and expected market volumes of carrots, sweet potatoes, peanuts, and onions, on at least a bi-annual basis.

This Project will finance the construction of an addition to the existing MTA building of approximately 3,400 square feet. The building will be of reinforced, concrete frame construction, commonly found throughout the Caribbean Region and will be designed to complement the existing MTA complex. This addition will increase usable office space by about 2,500 square feet to provide a suitable working environment for overcrowded conditions which now exist in the Ministry.

3. Inputs

The Project inputs consist of personnel, technical assistance, construction and renovation of buildings, production input commodities, produce packaging supplies, vehicles, certain

Project support equipment, including micro-computers, and consumable supplies. Total Project cost of \$2.354 million will be funded by AID Grant, GOSV in-kind contribution of \$209,000, and direct contributions from CARDI and UNDP of \$145,000.

C. Beneficiaries

The primary beneficiaries of the Project are the estimated 1,500 families in St. Vincent who are engaged in the production and/or marketing of carrots, sweet potatoes, peanuts, and onions. In particular, design estimates envision direct assistance to: 300 carrot growers, 100 onion growers, 300 peanut growers, 500 sweet potato growers, and 300 market traders. Through the application of improved technology and with the provision of improved support services, both of which are fundamental Project activities, these farmers and traders in St. Vincent engaged in the targeted commodities will experience increased production and productivity from their work.

It should be noted that direct beneficiaries account for about 15 percent of all farm families in St. Vincent, and almost all farm families engaged in the commercial production of carrots, peanuts, and onions. Most of these direct beneficiaries are believed to live and work in areas where banana cultivation is not dominant, and therefore typical family incomes are less than the national average. Therefore, increased incomes of the direct beneficiaries is not expected to worsen the income distribution patterns in St. Vincent, nor will non-direct beneficiaries perceive this assistance as unfair.

The secondary benefits of the Project will accrue to the broader population through the increased institutional capacity of the MTA, the Organization for Rural Development and SVMC to provide services to all persons who depend on agriculture for their livelihood. Finally, the modest, but significant addition to export earnings is an important benefit to St. Vincent, and it is expected that many of the methods used in this Project can be replicated to focus on other commodities selected for emphasis in the future.

D. Detailed Project Description

1. Project Strategy

The thrust of the Project strategy is market oriented, and purposely concentrates on four specific commodities that have the best market potential. The elements of the Project strategy

include activities for production, marketing, and institutional support, and each of the elements are aimed at solving specific problems associated with the four targeted crops. For example, production element activities under the Project will identify high yielding varieties of four commodities and make readily available the inputs required by farmers to achieve these yields. Work on improved varieties and input availability are selected precisely because these have been identified as priority production constraints in the four commodities. In a similar view, priority marketing problems involving short-term storage, availability of packing material, and technical know how for grading are addressed within activities of the Project's marketing element. And finally, elements of institutional support include work to perform an agricultural census, selected crop forecasting and other special studies all of which aim at providing information for enhancing both public and private investment decisions regarding production and marketing of the four targeted commodities.

The scope of the Project strategy is purposely tailored to capacity of Vincentian institutions to successfully implement the work required. Thus, the Project is focused on only four commodities, but includes work to address key problems in each commodity channel. A major criterion in selecting this strategy design was to minimize recurrent cost to the GOSV. Therefore, much of the Project assistance aims at fostering greater utility from existing resources, while the remaining Project assistance will establish new services that can generate self-sustaining revenues. To achieve this, the Project strategy makes as much use as possible of services through existing regional institutions, indigenous farmer associations, and ongoing GOSV institutions.

The selection of this strategy allows for a relatively quick impact on increased production and marketing of important export commodities, while at the same time strengthens the capacity of Vincentian institutions and individuals to replicate similar initiatives in other commodities in the medium- to longer-term. In this way, the strategy accomplishes a much needed quick boost in agricultural incomes and establishes an increased capacity for further growth.

2. Project Activities

a. Production Support

The Project will assist the MTA to improve agricultural research and to provide farmers with access to certain production inputs supplies like fertilizer.

(i) Research Activities

St. Vincent, like other small states in the Eastern Caribbean, contributes to the Caribbean Agricultural Research and Development Institute (CARDI) and depends on CARDI to accomplish the needed work in agricultural research. Project funds will be used to enable the GOSV to better direct and support CARDI to conduct specific applied research in St. Vincent. The problem addressed by this activity is the lack of knowledge regarding high yielding varieties of each commodity best suited to St. Vincent and regarding what level of inputs and types of cultural practices are most profitable for St. Vincent farmers. The objective of this research activity is to identify high yielding varieties of carrots, sweet potatoes, peanuts, and onions from other areas of the world having similar climate and soil types to St. Vincent, and select those varieties that are best adapted to the conditions in St. Vincent. This activity will involve three steps: (a) planning and preliminary selection of technology; (b) testing and adaptation of technology; and, (c) dissemination of technology. Responsibility for directing these activities rests with the MTA Research Unit, although CARDI will be primarily responsible for actual implementation of experimental activities, and substantial direct assistance will be provided by the MTA Extension Unit.

Planning and preliminary selection of technology requires work to identify and acquire germplasm of high yielding varieties, and work to upgrade the facilities and equipment where the actual research will be conducted. With regard to identification and acquisition of suitable germplasm, the Chief Research Officer of the MTA, in consultation with the CARDI Country Team Leader, will review the research literature to determine varietal germplasm available from other parts of the world that appear most appropriate for St. Vincent. In making such determination, it may be necessary to correspond directly with individuals at international research centers, seed companies, or universities. In any case, plans call for intense review of information about germplasm available from the Puerto Rico Experiment Station, CIAT, AVC, and the Universities of Florida, Texas, and California. The participation of CARDI through their existing relationships with other research centers will greatly facilitate this identification effort. The MTA Research Officer will identify up to 12 high yielding varieties each of carrots, sweet potatoes, peanuts, and onions, or up to 48 in total; and recommend that these be acquired for testing in St. Vincent. His recommendations will then be presented to the MTA National Agricultural Planning Committee for review and concurrence, prior to being presented to the Minister for approval. With the approval of the Minister, Project funds may be used to acquire the germplasm needed for testing.

With regard to upgrading research facilities and equipment, the MTA Research Officer and his staff will oversee the renovation of selected existing research station buildings, install needed fencing to protect field sites from stray animals, and procure essential research related tools, like soil testing kits, rain gauges, and small-scale irrigation equipment. The idea here is not to build complete research stations from scratch, but rather to rehabilitate the existing MTA sites to a level consistent with current requirements. Project funds will be used to accomplish the needed renovation and procure equipment, at an estimated cost of \$76,000.

Testing and analysis of technology requires work to conduct varietal field testing and data collection, and work to analyze the data for determining which varieties are better adapted to St. Vincent. With regard to design of a program for varietal testing, the MTA Research Officer, in consultation with the CARDI Country Team Leader, will systematically review the critical characteristics desired for each crop. The MTA Research Officer in consultation with farmers' organizations, private and public marketers, personnel of the MTA Extension Unit and the CARDI staff will identify the characteristics, such as yield, disease and pest resistance, length of growing season, market quality, etc., having relevance to production and marketing problems in St. Vincent. With the critical characteristics serving as criteria, experiments will be conducted by CARDI to statistically determine which varieties are significantly better than currently used alternatives. CARDI will cultivate varietal seed or vegetative material of each commodity in replicated, random rows, using generally accepted methods of experimental design. Data will be collected during the growing season, at harvest and during post harvest storage. It is planned that at least six experimental crop trials will be completed over the life of the project. Moreover, it is anticipated that some high yielding varieties can be confidently recommended after the first two experimental crop cycles, and on farm demonstration can begin with the third cycle, planned for about 15 months after the Project is initiated.

With regard to analysis of data, the MTA Research Officer and the CARDI Country Team Leader will collaboratively recommend the "best" variety for each commodity.

With regard to the dissemination of technology, the MTA Extension Unit has the primary responsibility to disseminate technology to farmers, although the MTA Research Unit, CARDI and ORD will all assist to encourage farmers to adopt the technology. For each commodity, about ten farmers will be invited by the Extension Unit to participate in "on farm" demonstrations of improved technology. Criteria for selecting demonstration farmers

will include recent production experience in the commodity which will be the object of his/her demonstration plot, participation in training sessions and in a farmer's organization input system, and agreement by the farmer to allow a field day's be held on his property. CARDI and the MTA research staff will play a support role to ensure proper procedures are followed.

(ii) Input Supply Activities

The Project will assist the Organization for Rural Development (ORD) expand its agricultural production input sales and distribution services which involves the provision of credit-in-kind to selected farmers. The ORD is a private voluntary organization established in St. Vincent in 1978 with the aim of assisting rural families increase their incomes.

The Project will provide funding of up to \$100,000 to purchase seeds, fertilizers, and pest control inputs to be sold and distributed by ORD. The ORD will determine the quantities and types of inputs required on a quarterly basis. This determination will be accomplished by summarizing the individual participating farmer requirements after verification by ORD field worker visits to each farm. The ORD will provide storage and physical distribution of inputs from existing facilities located in eight different villages in rural St. Vincent. Farmers will buy and take possession of these inputs at one of the eight facilities. The selling price by ORD is the landed cost of the inputs; plus actual direct cost of transport, handling, and storage; plus 10 percent to cover shrinkage and administrative expenses. If a farmer is determined to be credit worthy, the ORD will extend credit for the period of the crop in an amount not exceeding 75 percent of the value of the input. In other words, farmers wishing credit-in-kind will be required to pay at least 25 percent in cash. When credit is extended, expected to be typically the case, then ORD will charge interest of 1 percent per month on the outstanding balance.

All monies collected by ORD resulting from the sale of inputs will be accounted for separately from all other ORD funds and be deposited in a separate bank account. These funds will be used exclusively for purchasing agricultural inputs for sale and distribution to farmers.

Actual procurement of inputs will be accomplished by ORD, with the approval and concurrence of the Minister of Agriculture and the AID Project Officer. The methods used by ORD will follow established practices of other growers organizations in St. Vincent, whereby at least two trading companies solicit tenders from interested suppliers, and lowest price offer for the specifications required is the decisive criterion for award of the order.

b. Marketing Activities

The project will provide assistance to the St. Vincent Marketing Corporation (SVMC) for expanding its services to support private exporters of produce, while the SVMC simultaneously reduces its own activities in direct export trading operations. The services to be established by the SVMC are:

- 1) provision of secure and appropriate short-term storage space for produce awaiting ship loading;
- 2) provision of readily available cartons, bags, and other produce packing material suitable for produce; and
- 3) provision of training and technical services to traders in the areas of post-harvest handling, standardized grading and packing, and use of forward contracting.

(i) Short-Term Assembly and Storage Facilities

Project funds will be used by the SVMC to erect a covered shed of about 10,000 ft² near the port in Kingstown. This area will be available, on a fee basis, to private traders to store and prepare their commodities prior to export. It is expected that the duration of storage will typically be from one to three days. This service is expected to alleviate to a great extent the current problems of quality deterioration associated with produce exposure to direct sunlight and multiple produce handling. In addition, the availability of short-term storage service will enable many innovative traders to assemble their produce in a more orderly manner, execute required export documentation in advance of the ship's arrival, and otherwise avoid the cost of congestion on shipping days.

The SVMC will own and operate the short-term storage facility. While AID Grant funds in an amount of \$130,000 will cover the initial capital cost, the recurrent operating cost including management, night-watchman, utilities, repair, and depreciation will be sustained from revenue generated from the collection of rental fees. The area planned for short-term storage will allow about 65 spaces of 100 ft² size, after allowing for aisle space, that will be rented to traders. Each rentable space will accommodate 5 to 6 tons of produce when stacked at acceptable heights. A rental fee of US\$1.90 per day (EC\$5.00) for each 100 ft space will be collected from traders. Assuming these spaces

are rented only 80 days per year on the average, then gross revenues of about US\$9,700 will be generated, which is sufficient to cover direct cost plus maintenance. The proposed site for this facility has been selected for its proximity to the loading docks, and because additional space is available to expand in the future if the demand warrants such expansion.

The SVMC will also establish a pilot facility to properly store sweet potatoes for a medium-term period, e.g. 4 to 5 months. Plans call for about 1,000 ft² of warehouse space that will accommodate about 100 tons of sweet potatoes under requisite conditions. While the establishment of such storage is seen as a high priority by the GOSV to achieve more orderly marketing of sweet potatoes, the project is purposefully establishing a small-scale pilot facility to gain experience with the technology under Vincentian conditions. During the life of this project, the SVMC will utilize short-term technical assistance, as well as the services of CARDI, to evaluate the technical feasibility, cost, market acceptance, and overall utility of sweet potato storage to the national agricultural sector.

(ii) Packing Material Supply

The project will provide assistance to the SVMC to establish an inventory of appropriate cartons, bags, and crates for selected produce and initiate cash sales of these packing materials to private traders. The utilization of appropriate and standard packing by traders is inhibited because of no routinely available supply, and most traders are unjustified to order bulk volumes of cartons or other materials based on their individual weekly requirements. Nevertheless, it is estimated that an effective demand for about 3,000 cartons per week would be realized if traders could purchase materials in small lots as required. The expanded use of standard and appropriate packing materials is key to reducing bruising during shipment, and in addition it will facilitate the handling, stacking, and otherwise improve the efficiency of produce movement.

The SVMC will use Project funds to purchase an initial inventory of assorted packing materials equivalent to about an 8 week supply, e.g. 24,000 boxes, cartons, bags, etc. The typical value of each carton crate, or bag is estimated to be about US\$1.00 each (EC\$2.70). Thus, project funds in the amount of \$25,000 is budgeted to established the initial inventory. This inventory will be stored and sold from the existing SVMC facilities. Revenues generated from sales of these materials will be used to cover direct cost of the services and replenish the inventory on a monthly basis.

(iii) Training and Technical Services for Traders

The project will provide assistance to the SVMC for establishing certain training and technical services to private traders over the life of the project. This activity will involve the contracting of full-time produce marketing expert who shall aggressively perform outreach "marketing extension" to individual traders and associations of traders. This work will include practical training demonstrations to groups on proper produce handling, as well as individual consultancies to resolve specific problems. Priority will be given to promoting two specific practices among traders: (1) utilization of profitable packaging techniques and materials to maintain produce grades; and (2) establishment of forward contracts for consistent supply and risk reduction. In addition to the full-time technical services person, Project funds will be used to secure up to six months of short-term technical assistance to help solve specific problems. It is anticipated that short-term assistance will be required in areas like packing materials design, controlled environment storage feasibility studies, and phytosanitary inspection and control. AID Grant funds will be used to support this market training and technical services element at an estimated cost of \$300,000.

c. Agricultural Data Gathering and Analysis Activities

The Project will assist the MTA Statistical Unit to execute a national census of agriculture and to perform special purpose sample surveys including those required for crop production forecasting.

i. Agricultural Census Activities

Execution of an agricultural census will require seven major work elements as follows:

- * Initial Planning - 2 months
- * Sample Frame Design & Sample Selection - 1 month
- * Instrument Design & Documentation - 3 months
- * Field Interviews - 2 months
- * Coding/Editing & Data Entry - 1.5 months
- * Data Processing - 1 month
- * Analysis & Reporting - 2 months

Several of these work elements require specialized skills to accomplish, and adequate technical assistance is planned to supplement the MTA Statistical Unit staff for this work. Nevertheless, the design purposefully requires that national staff of the MTA Statistical Unit be totally involved in the census work, and in particular to take responsibility for those activities that are directly useful to the conduct sample surveys on a routine basis.

Unusually intensive levels of effort are required to conduct field interviews, perform coding and data entry functions, and accomplish the analysis required for the national census. For this reason, Project funds will be used to hire about thirty part-time field enumerators for a two month period. Similarly, temporary data entry operators will be hired for about 2,000 hours. To assist the existing MTA Statistical Unit staff execute the census, and to assist in the development of their own skills, Project funds will provide a long-term survey statistician for twenty-one months, who has both operational and training responsibilities. In addition, 12 months of short-term expatriate technical assistance is planned for different kinds of skills including sample frame specification, questionnaire design, data processing and data analysis.

ii. Crop Forecasting and Special Studies Activities

This activity builds on and is closely related to the execution of the agricultural census. Of fundamental importance to this activity is the establishment of a statistically reliable sampling frame accomplished for the agricultural census, as well as the practical experience gained during the census by the MTA staff in data collection, processing, and analysis. With these two attributes it is relatively easy for the Statistical Unit staff to undertake small-scale special purpose surveys. Among the first types of special purpose surveys planned under the Project is forecasting production yields of the four targeted crops. This activity replicates most of the work elements required for the census, but for a greatly reduced sample size and a much more limited data requirement. The work elements for crop forecasting work can be standardized, and indeed most elements must be standardized to achieve consistency and accuracy in the reports. During the life of the Project, at least four special crop surveys will be accomplished, with the object of forecasting expected yields of four crops on a bi-annual basis.

IV. IMPLEMENTATION ARRANGEMENTS

A. Project Plan

The Project will commence with the signing of the Grant Agreement on June 27, 1984 and will be implemented over a 30 month period. The PACD is December 31, 1986.

A detailed Project Implementation Plan and schedule is presented below. Because of the complexity of implementing and coordinating the three major components/activities under the Project, and considering that the MTA does not have sufficient senior administrative personnel to manage the number of activities which will be occurring simultaneously, project funds will be used to provide full-time Project Coordinator assistance to the MTA. This will assist to enable timely implementation to complete the Project by the PACD. The Project Coordinator will act as line personnel, directly responsible for Project implementation and management. He will be directly responsible to the Minister of Trade and Agriculture (or his designee) and will function within the Ministry's overall operations, assuring that the Project's objectives are being met.

B. Implementation and Procurement

The implementation and procurement of each major component is described below:

1. Technical Assistance

Major responsibility for the implementation and management for the Project will rest with the Project Coordinator. In addition, substantial operational responsibility for agricultural marketing and in agricultural data components of the Project will rest with long-term technical specialists. All these persons will be funded by the AID Grant. Procurement of this technical assistance will begin immediately following the signing of the Project Agreement. RFP's conforming with AID Regulations under Host Country Contracting will be issued in June of 1984. The Vincentian Project Manager, with assistance from the RDO/C Project Officer, will prepare the RFP's. It is anticipated that a technical assistance team will arrive in St. Vincent by September 1984.

The Project Coordinator's first task upon arrival will be to prepare a detailed Implementation Plan with critical dates for initiation and completion of Project activities. To assure close

monitoring on a daily basis, the Project Coordinator's tour of duty will terminate with the PACD.

The Project Coordinator will be responsible for supervising the other two contract team members and facilitating overall coordination among the Project elements.

The Project Coordinator will supervise:

- (1) The long-term technical advisor (Survey Statistician) to the MTA/SU, who will execute an agricultural census, assist with developing special purpose sample surveys focusing on crop production forecasting system.
- (2) Long-term technical advisor (Produce Expert) to the SVMC who will assist traders in improving postharvest handling of fresh produce, developing a standardized grading and packing system, establishing forward contracting, assist with implementing the price information system and monitoring on-site progress of the short-term storage facilities.
- (3) Short-term technical assistance in such specialized fields as fresh produce packing and handling, production and varietal selection criteria, evaluation of varietal trial data, data collection and survey techniques.

Under the overall management responsibilities, the Project Coordinator will:

- (1) Assist the MTA with the operational and implementation activities of the Project. The advisor will be counterparted to the Agricultural Economist in the MTA, and will assist this individual with procurement activities, assuring the functional responsibilities of the long- and short-term technical advisor are being completed and help develop improved management capabilities within the MTA.
- (2) Assist the MTA with the financial management of Project activities, assuring that AID procedures are followed, develop and monitor a tracking system for Project funds and assist with financial planning.

The Project Coordinator will also assist the Agricultural Economist and the Statistical Unit of the MTA perform special analysis of data with special reference to policy implications, and provide these analysis to the Central Planning Unit and other officers of the GOSV as appropriate.

The Project Coordinator will have as his primary counterpart the Agricultural Economist. These two individuals will have overall responsibilities for managing the day-to-day operations of all Project activities. General policy guidance will be provided by the Minister of Trade and Agriculture or his designee.

The Survey Statistician will be counterparted to the Head of the MTA's Statistical Unit. The MTA's Statistical Officer is directly responsible to the Permanent Secretary in the Ministry. The Project Coordinator will be responsible for assuring that the Survey Statistician activities are incorporated into the Ministry's overall operational activities through direct supervision over this technician. The Produce Expert Advisor will have as his counterpart, the General Manager of the St. Vincent Marketing Corporation. This Advisor will report directly to the Project Coordinator.

2. Commodities

a. Equipment and Vehicles

The Project Coordinator, with assistance from the two long-term advisors and in collaboration with the MTA Project Manager, will be responsible for the procurement of equipment and materials required by the Project. This includes preparation of any necessary specifications, development of necessary documentation, and as appropriate be the responsible agent for procurement and acquisition. Prior to the arrival of the Project Coordinator, the RDO/C Project Officer will assist the Project Manager (Agricultural Economist) to procure vehicles and other essential start-up equipment for the Project under Host Country Contracting Guidelines. This is to assure the vehicles arrive approximately at the same time the contract team does.

Procurement of right-hand drive vehicles has been requested by the GOSV. RDO/C has concluded that because (1) traffic moves on the left, which requires right-hand drive vehicles; and (2) the availability of spare parts is generally inadequate to properly service American made vehicles, a source/origin waiver be issued under FAA Section 635 (i) to allow procurement by the GOSV of three right-hand drive vehicles from countries in AID Geographic Code 935 for a total estimated cost of \$40,000.00.

b. Production Inputs

ORD will be responsible for the procurement of production inputs. Based on the production cycle and characteristics of each specific crop, the amount of fertilizer, pesticide and seed will be estimated by ORD based in field visits with participating farmers. The four target crops have varying lengths of production cycles, but on the average, ORD will procure supplies about once each 3 months.

ORD will determine input requirements based on the acreage of each specific crop through visitation by field workers to each farmer registered in the program. This information will be prepared by ORD's Administrative Assistant, into a request to the MTA's Project Manager, who will evaluate the proposal under Project Guidelines and with RDO/C concurrence issue approval for ORD to initiate procurement.

ORD under a Pro-Forma System, will solicit bids from suppliers and traders in Kingstown and within the Region. An award will be made based on an evaluation of bids received. RDO/C will reimburse directly to the supplier based on a Pro-Forma invoice for inputs received and delivered to ORD.

Inputs will be delivered by ORD to warehouse (depots) which are maintained in eight major crop production areas in St. Vincent. These depots are rented by ORD and current capacity is approximately 2,000 sacks of fertilizer or 10,000 cubic feet. It is anticipated that an approximate volume equivalent (including pesticide and seeds) of 1,500 sacks of fertilizer will be ordered every three months. Farmers wishing to purchase inputs from ORD are responsible for taking delivery of inputs at the appropriate depot in their Region. ORD will sell inputs at actual cost (CIF of imports, transport, storage & handling) plus 10 percent to allow for administration and shrinkage loss.

3. Construction

Construction of the SVMC storage shed and the MTA building expansion is expected to begin about November 1984. In July of 1984 architect and engineer services will be obtained through a request for proposals. The firm awarded a contract will complete detailed plans and a list of materials. The contract will also provide for engineering services to certify supervised construction activities. All construction will be by a local private sector firm in accordance with standard GOSV practices and in conformity with Host Country Contracting Guidelines. Construction work is expected to be completed within one year following award of the contract.

4. Procurement Plan

All procurement for goods and services will be conducted by the Government of St. Vincent in accordance with Host Country contracting procedures as provided for in AID Handbook 11.

a. Technical Assistance: The three long-term advisors and associated short-term personnel will be procured under one contract.

Interested firms will be evaluated and short listed based on a statement of qualifications regarding relevant factors such as Caribbean experience, qualified and available personnel in the needed disciplines, past experience in similar activities proposed in the Project, Project implementation experience with AID and/or other U.S. Federal Agencies, as well as managerial, financial and specific technical experience required for the Project. Firms will be invited to submit prequalification data to be evaluated by the MTA through a notice in the Commerce Business Daily.

The GOSV will form an evaluation committee which will be comprised of the MTA Agricultural Economist (Chairman), the Head of the MTA Statistical Unit, the General Manager of the SVMC, a technical representative for the MTA, i.e. the Chief Agricultural Officer or his Deputy and the Permanent Secretary of the MTA. USAID will be represented by the Project Officer as a non-voting observer.

The evaluation committee will quantifiably evaluate each of the qualifying statements submitted using an evaluation chart to determine relevant prior performance, applicable experience and the capacity to implement the Project. The firms will be rank ordered and short listed based on their total scores received during the evaluation process. Each of the short listed firms will be asked to respond to a RFP.

RFP's will be evaluated using a similar process as described above. The evaluation committee, whose composition will remain basically the same as for the prequalification statements, will rank order firms based on their proposals submitted in response to the RFP's. The first rank order firm will be asked to submit a cost proposal and invited to negotiate a contract with the Government of St. Vincent. The outcome of the negotiations will provide the basis for contract award.

During each major step in the procurement process, the Contracting Agency (MTA) will prepare a memorandum explaining the basis for selections of firms on the short list, the evaluation of RFP's, and final contract award and provide a copy of the memorandum(s) to RDO/C which will be used for obtaining Mission approval as required in Handbook 11.

b. Commodities: The primary responsibility for commodity procurement under the Project will rest with the long-term technical team and will be incorporated into the statement of work. With the exception of vehicles which are discussed below, the procurement for all other materials, equipment and commodities will be conducted in the following manner.

(1) Production Inputs

The Project Coordinator will assist ORD to prepare a Request for Quotations to be advertised in St. Vincent for the procurement of fertilizer. In order to develop a system that will sustain after Project assistance has been completed, RDO/C feels that the most appropriate manner is to procure fertilizer through existing supplier in St. Vincent. Fertilizer is available Regionally and RDO/C proposes that this be the source for fertilizer to be financed under the Project. This will require the issuance of a source/nationality waiver. The materials used in the formulations of fertilizer available through Regional suppliers originates in the United States, however the mixing and bagging of these materials produces a commercially recognized new product which is substantially different from the original materials which necessitate a waiver.

The reasons for proceeding with this mode of procurement for the fertilizer is based on the following rationale: (i) In order to best serve the "developmental process", RDO/C feels that a system that is sustainable in the context of Vincentian conditions should be established. ORD over the life of Project will make several (approximately 10 which will average less than \$10,000 U.S. each), small procurements of fertilizer. This scale of operations can be readily handled through suppliers in St. Vincent who do this type of procurement on a routine basis. Through this system ORD will over the life of Project gain the necessary experience in conducting procurement actions that can be sustained after AID financed technical assistance has been completed. (ii) The price of fertilizer Regionally is approximately US\$110 per ton as compared to U.S. supplies of approximately US\$350 per ton on a CIF basis. These prices, the latter based on information obtained from suppliers on St. Vincent and the former based on price quotations received in January of 1984 in connection with another AID financed Project, supports the issuance of a waiver in accordance with AID Handbook 1B when the delivered price from the U.S. would be at least 50 percent more than from another source (AID Geographic Code 935).

Other production inputs such as seed and approved pesticides will be procured through informal competitive procedures. These procurements will occur in small quantities

during the Project in dollar amounts estimated to be less than \$5,000 each. The Government of St. Vincent will issue a Request for Quotations which will be reviewed and approved by RDO/C prior to distribution. The RFQ will be advertised in the Commerce Business Daily and the Procurement Information Bulletin. The RFQ will be forwarded by the MTA to all firms requesting it and other firms identified by the MTA which they may wish to solicit. The MTA (evaluation committee) will open all qualifications in a public form at the time and place indicated in the RFQ. Negotiations will be conducted with the offeror or offerors that fall within a competitive range based on price, terms of delivery and timely availability.

(2) Project Support Commodities

These commodities comprise office equipment, micro-computers, and packaging materials. Each of the long-term advisors will be responsible for developing the specifications for any equipment and materials to be procured under the Project. The advisors will also assist with the preparation of RFQ's. The Project Coordinator will be responsible for monitoring this process and assuring that activities are carried out in a timely manner.

The MTA will issue the RFQ's to interested firms who respond to advertising in the Commerce Business Daily and the export opportunities. Bids received will be evaluated by the evaluation committee described in 4(a) above and award of contract made to the lowest responsive and responsible bidder.

(3) Vehicles

Three vehicles are to be procured with Project funds. In order to have vehicles available in St. Vincent to carry out Project activities, as soon after Grant Agreement execution as possible, the RDO/C Project Officer will assist the MTA Project Manager to develop specifications and prepare IFB's. The MTA will issue RFP's to interested firms who respond to an advertising notice. The bids will be evaluated by a committee comprised of the MTA Project Manager, the Permanent Secretary (MTA), and the General Manager of the St. Vincent Marketing Corporation. The RDO/C Project Officer will be a non-voting observer. A contract will be awarded to the lowest responsive and responsible bidder.

(4) Waiver

A source and origin waiver is requested from

AID Geographic Code 000 to AID Geographic Code 935 to allow procurement of the three four-wheel drive vehicles required to carry out the effective implementation of this Project.

During the design of the Project it was determined that American made vehicles are generally not suitable for conditions in St. Vincent for the following reasons:

(i) Traffic flows on the left, thus requiring right-hand drive vehicles. Left-hand drive vehicles are permissible under the laws of St. Vincent, but their intensive use, as is envisioned under the Project, could be hazardous. St. Vincent is a mountainous country with narrow, winding roads which present less than optimal driving conditions, even with right-hand drive vehicles.

(ii) The availability of spare parts is generally inadequate in St. Vincent for the proper services and maintenance of American made vehicles. Dealerships are exclusively tied to British, German, and Japanese vehicles. Because of poor road construction and conditions, particularly in rural areas, it is the opinion of the RDO/C Agriculture Office that the lack of adequate maintenance capability for American made vehicles could be a major impediment to implementation of the Project.

Although Section 636(i) of the Foreign Assistance Act of 1961, as amended, requires that AID financed motor vehicles be of U.S. origin, it further specifically provides for waivers of the U.S. - origin requirements - where special circumstances exist. AID Handbook 1, Supplement B, Chapter 4C2(d) specifically cites the inability of U.S. manufacturers to provide right-hand vehicles and a projected lack of service facilities and spare parts supply, as special circumstances which may merit waiver of the provisions of Section 636(i). Authority has been redelegated to waive the U.S. origin requirement for motor vehicles when necessary to carry out the purposes of the FAA. Pursuant to Redelegation of Authority No. 1 of April 28, 1982, the Mission Director has the authority to approve vehicle waivers up to \$50,000.

For the reasons discussed above, and pursuant to the special circumstances cited in Handbook 1B, Chapter 4C2(d), it is requested that a waiver of the source and origin requirements of Section 636(i) of the FAA be approved to allow procurement of up to three vehicles and spare parts from countries included in AID Geographic Code 935. The estimated cost for this procurement is \$40,000 and is within the Mission Director's redelegation authority to issue the waiver requested.

(5) Construction

The Contracting Agency (MTA) will employ a consulting architect/engineer who will be responsible for design work, preparation of construction schedules and cost estimates required to determine the reasonableness of bids, preparation of any prequalification questionnaires and the evaluation of responses, development of any IFB's and assistance in the evaluation of bids; and supervising the work of the contractor. The services of the consulting architect/engineer will be obtained through a Request for Proposals from interested firms and individuals by public advertisement. A committee consisting of the MTA Project Manager, the Project Coordinator, and the Permanent Secretary (MTA) will evaluate and rank order the RFP's. An RDO/C Engineer and the RDO/C Project Officer will be non-voting observers on this committee. The consulting architect/engineer first ranked will be awarded a contract to carry out the procedures to competitively award a construction contract and supervise the contractor work. The consultancy architect/engineer will evaluate bids and proposals submitted by potential contractors and recommend to the committee (discussed above) a rank ordering. The committee will be responsible for final selection with a contract award for construction services made by the MTA.

During each major step in the procurement process the MTA will provide documentation explaining the process completed which will be the basis for obtaining Mission approval.

(6) Agricultural Census

The MTA Statistical Unit will be responsible for conducting the national Census of Agriculture. In order to complete this activity, additional personnel will be required on a short-term basis to provide field supervision and to conduct the required interviews for collection of data.

The Contracting Agency (MTA) will procure the services for short-term personnel in accordance with Handbook 11, Chapter 1, Annex A, Contracting with Individuals for Services. Two types of personnel, field supervisors and enumerators will be required to conduct census activities. Field supervisor will be selected through an advertised announcement stating duties, responsibilities, duration of assignment and other relevant factors. This announcement will be prepared by the Statistical Unit with assistance from the long-term advisor and Project Coordinator. The announcement will request interested individuals to submit responses to the Ministry of Trade and Agriculture indicating

technical and academic qualification, salary history, relevant experience and other factors considered important and/or commensurate with the required description of duties and responsibilities included in the announcement.

A committee consisting of the Head of the Statistical Unit (Chair Person), the MTA Project Manager, the Permanent Secretary (MTA), the Project Coordinator and the MTA/SU long-term advisor, will evaluate the responses received, selecting the individuals considered to be the best qualified to complete the duties, basing the evaluation on the qualifications presented. The MTA will enter into negotiations with the selected candidate and will finalize the terms and conditions of the contracts. Upon completion of negotiation, and prior to signing, the MTA will submit for review with any appropriate documentation, the contracts for Mission approval.

Given the nature of the information that will be requested from respondents involved in the census and the reluctancy of rural residents to provide personal information, requires enumerators to be well-known within the local community. School teachers, health workers and other individuals who are respected within a given area, will be identified by field supervisors as potential enumerators. In addition, an announcement will be advertised to obtain the widest possible number of potential candidates. It will be the responsibility of the field supervisors to evaluate and recommend to the evaluation committee described in this section, the best qualified candidates based on an evaluation of the qualifications presented. Interested candidates will present biographical data summaries to the field supervisors for this evaluation. The MTA will award contracts to the individuals recommended by the field supervisors subject to review and recommendation of the evaluation committee. Given that approximately 30 field enumerators will be hired and the terms and conditions of the contract will be standardized, RDO/C approval will be based on the recommendations of the evaluation committee which will be given ad hoc authority after RDO/C has reviewed the draft contract and its conditions. After award of contracts to enumerators, the MTA will notify the Mission as to the number of contracts issued and provide any other relevant information to monitor this activity.

The collection of data during the census will require the contracting of data entry operators. These individuals will be hired using the procurement arrangement described for the field enumerators. Announcements will be advertised for individuals having appropriate qualification as data entry operators. Those interested individuals submitting responses will be evaluated by the committee. The long-term advisor to the MTA/SU will be responsible for developing the qualifications for data entry operators. The MTA will issue contracts to those best qualified candidates as

recommended by the evaluation committee. The terms and conditions of these contracts will be standardized and therefore RDO/C can provide ad hoc approval by reviewing and agreeing prior to issuance of the contracts.

C. Project Operations

1. GOSV Responsibility

The Ministry of Trade and Agriculture (MTA) and the St. Vincent Marketing Corporation (SVMC), a parastatal agency, are the two major Vincentian public sector institutions responsible for implementation.

a. MTA

The MTA will be responsible for overall financial and operational management of the Project. A Project Manager, the Agriculture Economist, will be the direct counterpart to the long-term Project Coordinator funded by the Project. The Project Coordinator together with the Project Manager will report directly to the Ministry of Agriculture (or his designee) on all matters related to the operational activities of the Project.

The Head of the MTA Statistical Unit will be counterparted to a second long-term advisor, the Survey Statistician. This Unit will be responsible for supervising and conducting the agriculture census, conducting special surveys and studies, and publishing these data on a routine basis. The Survey Statistician will report directly to the Project Coordinator.

The Research Officer of the MTA will be responsible for directing varietal trial and selection activities. Short-term technical assistance financed by the Project will be provided to develop selection criteria and evaluate experimental trial data. CARDI will implement actual field experiments under the general direction of the MTA Research Officer.

b. SVMC

The SVMC will be responsible for implementing the marketing activities under the Project. The General Manager of the corporation will be counterparted to the long-term advisor (Produce Expert). The SVMC will manage the short-term storage shed to be

financed under the Project, initiate sales of standardized packing materials, and publish current market price information. The Produce Expert will report directly to the Project Coordinator.

2. St. Vincent Private Sector

ORD will be responsible for the procurement, distribution, and sales of production inputs to be financed under the Project. This will involve ORD arranging for all necessary transportation, handling, and storage of the inputs, as well as actual sales to participating farmers. It is envisioned that ORD will in many cases extend credit-in-kind to farmers using established ORD procedures to monitor and collect loan repayments.

3. CARDI

CARDI will collaborate with and assist the MTA to implement the varietal trials to be conducted under the Project. CARDI will finance almost all consumable inputs associated with experimental trials and provide technical support to the MTA Research Officer in identifying and acquiring seed material, set-up experimental design and evaluate trial data.

4. RDO/C Responsibilities

The RDO/C Office of Agriculture and Rural Development will provide overall monitoring of Project activities to include regular Project site trips to St. Vincent. During the initial implementation phase, and prior to the approval of technical advisors, the RDO/C Project Officer will make frequent trips to St. Vincent to assist the GOSV in meeting conditions precedent, coordinate Mission approval of consultants, contracts and development of appropriate documentation to procure commodities. Backstop support will be provided by the Capital Project Development Office and the Controller's Office. The Mission will also take active participation in the mid-term and final evaluation.

V. COST ESTIMATE AND FINANCIAL PLAN

A. Donor Contribution

The total estimated cost of this Project is \$2,354,000 to be disbursed over a period of 30 months. Of this amount, AID will provide \$2,000,000 in Grant funds including approximately \$1,200,000 for technical assistance, \$530,000 for equipment and supplies, and \$270,000 for construction.

The Government of St. Vincent and the Grenadines will provide an in-kind contribution estimated at \$209,000. The major portion of this contribution consists of personnel from the Ministry of Trade and Agriculture: a full-time Agricultural Research Officer, two full-time laborers and, within the Statistical Unit, the full-time services of an Economist, Statistician and Statistical Assistant. Part-time services of Agricultural Extension Agents will also be contributed throughout the Project, as will secretarial and office support.

The following organizations will also provide assistance estimated at \$145,000 for various Project activities:

1. CARDI will provide assistance for the Production Support Component, including a full-time technician, about 6 months of short-term T.A. from its core staff, and almost all of the consumable supplies and casual labor required to accomplish the varietal trials and experiments.

2. The UNDP is financing a one year contract for an expert in economic/agricultural planning. This advisor will be assigned to work in the Finance and Agriculture Ministries, and will work part-time on the Project.

3. The Peace Corps has a volunteer with an Agriculture Economics background assigned to the St. Vincent Marketing Corporation. The PCV will assist full-time in marketing information activities under the Project.

B. Recurring Costs

A specific objective of the Project design is to improve production of selected crops, upgrade marketing services and increase agriculture data gathering capabilities without adding to the operating costs of the MTA. The major inputs for this Project are long- and short-term technical assistance services which will not be needed after the Project is completed.

The cost of maintaining the short-term storage facility constructed under the Marketing Component of the Project will be adequately covered by the revenue generated rental fees collected by the SVMC.

The equipment provided under the Project that will cause an increase in GOSV recurrent costs include office equipment, micro-computers, air conditioners and vehicles. The following list identified the specific items and outlines the potential increase in recurrent costs of each:

1. Three Typewriters - Cost of ribbons, maintenance and repair should not exceed US\$20.00 for each machine per year, US\$60.00 total recurrent costs per year.
2. Photocopy Machine - The per copy cost, including maintenance, is US\$0.03, with an estimated 5,000 copies each year for a total recurrent cost of US\$150.00 per year.
3. Three Micro-Computers - The operating expense, for maintenance contract and miscellaneous supplies, is US\$420.00 per year each, for a total recurrent cost of US\$1,260.00 per year.
4. Two Air Conditioners - The electrical cost of operating two 8,000 BTU units for ten hours per day to maintain a 70 degree F temperature, is US\$6.73, for a total recurrent cost increase of US\$3,362.00.
5. Three vehicles - Gasoline and maintenance expense is US\$30.00 per 100 miles, each vehicle is estimated to travel 7,500 miles per year for a total recurrent cost of US\$6,750 per year.

The total increase in recurrent costs for the GOSV resulting from the implementation of the Project should be approximately US\$10,000 per year. This represents less than one percent of the MTA annual budget. The effect of this increase is not significant.

The MTA will be the major institution responsible for financial management of the Project. The MTA will establish a separate account for management of the Project funds. The Project Coordinator will assist the MTA Financial Manager by developing a tracking system which will provide information on obligations and disbursement against Project budget line items. This system will be separate from the MTA's overall accounting procedures to provide close monitoring of Project funds and allow forward planning regarding financial considerations of the Project.

The MTA has the in-house capabilities to establish a cost accrual system for financial accountability. The MTA will establish a separate account and will provide quarterly reports on obligations, disbursements of Project funds to provide relevant financial information.

C.

SUMMARY COST ESTIMATES
All Years (\$'000)

<u>ACTIVITY</u>	<u>AID</u>	<u>GOSV</u>	<u>OTHER</u>	<u>TOTAL</u>
1. <u>Production:</u>				
a. Research Facilities & Support	76	46	-	122
b. Research Field Operations	-	19	50	69
c. Short-Term T.A. (6 mons.)	60	-	25	85
d. Production Inputs for Farmers	100	-	-	100
SUBTOTAL	<u>236</u>	<u>65</u>	<u>75</u>	<u>376</u>
2. <u>Marketing:</u>				
a. Short-Term Shortage		25	10	35
i. Export Trade Shed	130			130
ii. Pilot Sweet Potato Storage	50			50
b. Packing	25	-	3	28
c. Marketing Info.	9	5	5	19
d. Produce Expert (24 mons.)	240	-	-	240
e. Short-Term T.A. (6 mons.)	60	-	-	60
f. Vehicle	12	6	-	18
SUBTOTAL	<u>526</u>	<u>36</u>	<u>18</u>	<u>580</u>
3. <u>Data Gathering & Analysis:</u>				
a. Personnel	65	100	-	165
b. Long-Term T.A.				
* Project Coordinator (27 mons.)	270	-	-	270
* Survey Statistician (21 mons.)	210	-	-	210
* Senior Agr. Planner	-	-	50 ^{1/}	50
c. Short-Term T.A. (12 mons.)	120	-	-	120
d. Micro-Computers	40	-	-	40
e. Expendable Supplies	15	5	2	22
f. Vehicles Rent/Purchase	25	-	-	25
g. Office Refurbishing & Equipment	165	-	-	165
h. Pesticide Safety	15	-	-	15
SUBTOTAL	<u>925</u>	<u>105</u>	<u>52</u>	<u>1,082</u>
4. <u>Project Evaluation:</u>	<u>40</u>	<u>3</u>	<u>-</u>	<u>43</u>
PROJECT SUBTOTAL	1,727	209	145	2,081
5. <u>Inflation:</u>	<u>223</u>	<u>-</u>	<u>-</u>	<u>223</u>
6. <u>Contingency:</u>	<u>50</u>	<u>-</u>	<u>-</u>	<u>50</u>
PROJECT TOTAL	2,000	209	145	2,354

^{1/} Financed by UNDP.

D. PROJECTION OF AID EXPENDITURES
BY PROJECT YEAR

(\$'000)

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3^{1/}</u>	<u>Total</u>
1. <u>Production:</u>				
Research Facilities	58	18	-	76
Research Field Operation	-	-	-	-
Short-Term T.A.	30	20	10	60
Farm Inputs	<u>60</u>	<u>40</u>	<u>-</u>	<u>100</u>
SUBTOTAL	148	78	10	236
2. <u>Marketing:</u>				
Storage	180	-	-	180
Packing	25	-	-	25
Marketing Info.	9	-	-	9
Produce Expert	60	120	60	240
Short-Term T.A.	30	30	-	60
Vehicle	<u>12</u>	<u>-</u>	<u>-</u>	<u>12</u>
SUBTOTAL	316	150	60	526
3. <u>Data Gathering & Analysis:</u>				
Personnel	10	55	-	65
Project Coordinator	90	120	60	270
Survey Statistician	60	120	30	210
Short-Term T.A.	60	60	-	120
Micro-Computers	40	-	-	40
Office Renovation/Equip.	165	-	-	165
Vehicles & Supplies	20	25	-	40
Pesticide Safety	<u>5</u>	<u>5</u>	<u>5</u>	<u>15</u>
SUBTOTAL	450	380	95	925
4. <u>Project Evaluation:</u>				
	<u>10</u>	<u>-</u>	<u>30</u>	<u>40</u>
PROJECT SUBTOTAL	924	608	195	1,727
5. <u>Inflation:</u> (12% Per Annum Compounded)				
	<u>107</u>	<u>82</u>	<u>34</u>	<u>223</u>
6. <u>Contingency:</u> (3%)				
	<u>26</u>	<u>18</u>	<u>6</u>	<u>50</u>
PROJECT TOTAL	1,057	708	235	2,000

^{1/} Project Year 3 includes six months only.

ST. VINCENT AGRICULTURE DEVELOPMENT PROJECT

E. DETAILED COST ESTIMATE

1. Production

a. Research Facilities and Support - US\$

I. Renovation - Camden Park

1. Main Building	8,000.00
2. Storage Building	7,000.00
3. Storage Area (Dairy Bldg.)	<u>3,000.00</u>

\$18,000.00

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II. Office Equipment

1. Main Building

a) 1 typewriter	\$ 300.00
b) 4 filing cabinets	800.00
c) 4 storage cabinets	1,480.00
d) 4 desks	1,400.00
e) 4 desk chairs	400.00
f) 6 work chairs	210.00
g) 1 lab table (soils room)	<u>410.00</u>

\$5,000.00⁹

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III. Vehicle

4 WD, 1/2 ton capacity truck -	\$12,000.00
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US\$

IV. Equipment

1. Soils Lab

a) Soil testing apparatus, with reagents	\$1,695.00
b) Metric/English analytical balance 2,000 gram capacity	400.00
c) Scale - 10 lb. capacity	85.00
d) Soil auger	125.00
e) Sample bags	600.00
f) 4X Lense	35.00
g) 2 - ten gallon water tanks with spigot	<u>60.00</u>
	\$3,000.00 =====

V. Field Site Improvements

1. Keartons

a) Fencing, 1,800 ft.	\$12,000.00
b) Storage shed	<u>3,000.00</u>
	\$15,000.00 =====

2. Camden Park

a) Fencing, 400 ft.	\$ 3,000.00
b) Storage shed	<u>3,000.00</u>
	6,000.00 =====

3. Irrigation Equipment - Keartons

a) pump	\$ 4,000.00
b) PVC pipe, 1,000 ft 1/2 inches	1,000.00
c) water tank	3,000.00
d) Drip system	7,000.00
e) Other	<u>2,000.00</u>
	\$17,000.00 =====

	US\$
b. <u>Short-term T.A.</u>	
1. 6 months @ \$10,000/month	\$60,000.00 =====
c. <u>Production Inputs for Farmers</u>	
1. Peanuts - 250 acres @ US\$153.48	38,370.00
2. Onions - 30 acres @ US\$214	6,420.00
3. Carrots - 132 acres @ US\$126	16,632.00
4. Sweet potatoes - 500 acres @ US\$64	32,000.00
5. Seed Material	
a) Peanuts 5,000 lbs. @ \$.74/lb. =	3,704.00
b) Onions 150 lbs. @ \$7.40/lb. =	1,111.00
c) carrots 240 lb. @ \$7.40/lb. =	<u>1,776.00</u>
	\$100,000.00 =====
Total for Production Component	236,000.00
2. <u>Marketing</u>	
a. <u>Short-term Storage</u>	
1) <u>Covered Work Area</u>	
a) Site preparation and foundation	\$ 27,535.00
b) Pre-fabricated building components plus freight	76,406.00
c) Construction	16,750.00
d) Lighting	9,309.00
2) <u>Pilot Sweet Potato Storage</u>	<u>50,000.00</u>
	\$180,000.00 =====
b. <u>Packing Material</u>	
1) Cartons, 50 lb. capacity, 20,000 @ \$1.00	20,000.00
2) Misc. Packing items	<u>5,000.00</u>
	\$ 25,000.00 =====

US\$

c. Marketing Information

Office Equipment

1) Desks, 2 @ \$350	\$ 700.00
2) Filing cabinets, 2 @ \$400	800.00
3) Desk chairs, 2 @ \$100	200.00
4) Work chairs, 2 @ \$35	70.00
5) Double cabinets, 2 @ \$370/each	740.00
6) 1 typewriter @ \$300	300.00
7) Book cases, 2 @ \$150	300.00
8) Work tables, 2 @ \$100	200.00
9) Desk top calculator with scientific functions and hard copy	<u>1,005.00</u>

\$4,315.00

=====

2) Publishing Material

a) Photocopy, plus supplies	\$ 2,200.00
b) Mimeograph, plus stencils	800.00
c) Expendables, paper products, etc. 10,000 commodity reports @\$.20/each	<u>2,000.00</u>

\$5,000.00

=====

d. Technical Assistance

1) Product expert 24 months @ \$10,000/month	\$240,000.00
2) Short-term 6 months @ \$10,000/month	<u>60,000.00</u>

\$300,000.00

=====

e. Vehicle

\$ 12,000.00

=====

Total for Marketing Component

\$526,315.00

US\$

3. Data and Gathering Analysis

a. Personnel

Census Advisor (1 year)	\$ 11,000.00
Census Director (1 year)	9,000.00
80 Enumerators, 6 wks	33,600.00
10 Supervisors, 7 wks	6,600.00
4 statistical assistants, 4 mths	1,600.00
4 data entry assistants, 4 mths	<u>3,200.00</u>
	\$ 65,000.00
	=====

b. Technical Assistance

Project Coordinator, 27 mths	\$270,000.00
Survey Statistician, 21 mths	210,000.00
Short-term, 12 mths	<u>120,000.00</u>
	\$600,000.00
	=====

c. Micro-computers

3 micro-computers with floppy disk drives and printers @ \$7,000/each	\$21,000.00
3 ten megabit hard disk drives @ \$1,000/each	3,000.00
3 power regulators @ \$200	600.00
3 replacement part bits @ \$1,000/each	3,000.00
3 survey statistics soft ware @ \$200	600.00
3 word processing soft ware @\$200	600.00
3 graphing software, @ \$400	1,200.00
3 warranty contracts @ \$1,000	3,000.00
2 - 8,000 BTU air conditioners @ \$600	1,200.00
Miscellaneous	<u>3,000.00</u>
	\$40,000.00
	=====

	US\$
d. <u>Expendable Supplies</u>	
- Printing material for census, training material	\$15,000.00 =====
e. <u>Vehicles</u>	
Rent/Purchase	\$25,000.00 =====
f. <u>Office refurbishing and Equipment</u>	
MTA Building Expansion	150,000.00
Desks, tables, space dividers, filing cabinets, etc.	\$ 15,000.00
g. Pest safety	<u>15,000.00</u>
Total for Data Gathering and Analysis	\$955,000.00 =====
4. Evaluation	\$ 40,000.00 =====
Production	\$ 236,000.00
Market	526,000.00
Data Analysis	<u>965,000.00</u>
SUB-TOTAL	\$1,727,000.00
Inflation & Contingency	\$ <u>273,000.00</u>
TOTAL	\$2,000,000.00 =====

VI. SUMMARIES OF ANALYSIS

A. Technical Analysis

The basic analysis and rationale for the proposed Project was accomplished and conceived as an outcome of an Assessment to the St. Vincent Agricultural Sector performed by the Midwest Universities Consortium for International Activities. The Assessment pointed out two fundamental characteristics constraining Vincentian Agriculture, namely: (a) high per unit cost of production and distribution; and (b) high risk. While these two generalizations are applicable to all crop enterprises, the relative importance of contributing factors vary according to different crops. Thus, it is recommended that a "commodity focused" approach be used to design assistance, and therefore four commodities believed to have the best market potential have been selected for emphasis.

The work elements to be accomplished in the Project involve: (a) increased availability of input supplies to farmers, (b) testing and selection of improved planting material, (c) improved marketing services to export traders, and (d) improved production and price information availability. All of these work elements address a particular set of technical constraints utilizing known methods. Indeed, all of these activities are already being done in St. Vincent, albeit at a very modest level. The point is that no exotic or unproven approaches are proposed, and the technology itself is suitable in the context of St. Vincent. In essence, this Project will support important incremental improvements in what is already familiar to the Vincentians.

As a result of investigations during Project design work, one important modification from the Project Identification Document was made. The use of environmental storage for sweet potatoes on a large commercial scale is not recommended without further country specific experience. The consulting plant pathologist advised that the specific gravity of Vincentian sweet potatoes and the endemic problem of potatoes weevils may be corrected or minimized with the use of improved varieties in combination with appropriate storage facilities. Therefore, rather than a large commercial storage building envisioned in the PID, the Project will finance a modest investment in a pilot storage facility to test and evaluate improved sweet potato varieties under actual Vincentian conditions. Recommended cultivars identified by the research component of this Project will be stored on a pilot basis to determine the feasibility of storage in the St. Vincent context. Based on the information developed regarding cost and market acceptability a determination will be made for possible expansion of the pilot storage facilities on a commercial basis.

B. Institutional Analysis

This Project involves direct participation by three St. Vincent Organizations:

1. The Ministry of Trade and Agriculture (MTA);
2. The St. Vincent Marketing Corporation (SVMC); and
3. The Organization for Rural Development (ORD).

In addition, substantial direct Project assistance will be provided by the Caribbean Agricultural Research and Development Institute (CARDI).

Consistent with the size and resources of St. Vincent, all of these organizations are relatively small in terms of staff and budget. Nevertheless, each of them have demonstrated capability to direct and manage specific services of modest proportions. For example, the MTA Research Unit and the MTA Statistical Unit, both of which will have major Project responsibilities, are directed by well trained individuals. These units only have three or four staff members and very modest facilities with which to work. Still, these units work on limited assignments that fit these resources. Likewise, the SVMC (a parastatal agency) and the ORD (a non-Governmental farmers' association) have a record of six or more years of administrative and financial solvency. Both of these organizations have previously received grants from other donors and have acquitted themselves well in the use of these grants.

In regard to ORD, of the total amount of Grant funds received in 1982, EC\$130,000 or over fifty percent were allocated to an Agricultural Revolving Loan Fund. Items included in the fund were vegetable seed, chemicals, fertilizer, lime and rat poison. The Organization appears to have gained from experience over the last three years and is increasing the percentage of repayment of loans from an initial low of 24 percent at the beginning of the program to 86 percent during the last production season, 1983. The most recent audit, by Coopers and Lybrand, Ltd., indicates that ORD's financial monitoring system is adequate and that the Revolving Fund will be maintained by the 10 percent surcharge and interest charges, currently required of participants.

Common to all institutions in St. Vincent is the relatively low number of senior administrative personnel. This is true in the MTA where existing management staff is already stretched very thin; similarly in SVMC and ORD the number of seasoned management personnel are limited to two or three individuals. It is for this reason that the Project design purposefully includes AID

Grant funding of a Project Coordinator over the life of Project, in addition to area specific technical assistance in data gathering and marketing.

In no case does the project design envision increases in the number of staff or inordinate increases in other recurrent cost items. Instead, the thrust of the Project is exactly to get greater productivity from existing resources, in both the public and private sectors.

With the technical assistant and commodities provided under this Project, the organizations directly affected are able to effectively implement the work elements proposed and able to sustain and build on these elements in the future.

C. Economic and Financial

The financial analysis describes the cost and benefits accruing to the individual parties participating or directly affected by the Project. The parties considered are the producers, the traders, the consumers, the MTA, the SVMC, and the ORD. The producers will increase yields through increased use of purchased inputs and improved varieties. The increased costs, principally the inputs, are small compared to increased revenues. The price of carrots, peanuts and sweet potatoes would have to fall respectively to 30%, 53%, and 64% of present levels not to have an increase in per acre, net returns. Per farmer increases in net returns are expected to be about EC\$1,000 for carrots and sweet potatoes and double that for peanuts. The traders as a group stand to benefit from increasing their margins, through cutting losses and delivering a better product and from handling increased volumes. The costs incurred will be minimal and will include payment for storage space and packing materials. Increases in net returns per trader are anticipated to be about EC\$500 annually. The consumers stand to benefit from the increased availability and quality of the four commodities. Prices may tend to increase for better quality produce and fall for lesser quality. The MTA will benefit from the improved information availability by better matching its programs to the farming population and by responding to problems and opportunities identified by monitoring the production of the four commodities. The MTA will not incur additional operating costs. The SVMC will benefit by taking advantage of an opportunity to change the character of its operations, moving from an area of inherent disadvantage, i.e. direct trading of commodities, to an area of advantage, i.e. providing services to private traders. One of those services, providing regular market price information will incur limited costs, but no revenue. ORD will benefit by increasing the reliability of its supply of the four commodities to the market,

improving its ability to forward contract and thus expand its operations. All costs incurred should be covered by interest on the in-kind loans.

The economic analysis is limited to a summation of the costs and benefits over the affected parties. Based on the limited data available, i.e. budgeted net returns to producers and traders as well as direct Project costs, an internal rate of return of 33 percent is calculated for a twenty year stream of benefits. The assumptions behind the calculations are considered to be quite conservative.

D. Social Soundness Analysis

The Project is designed to improve the lives of small holder farmers and others associated with agriculture in St. Vincent by enhancing the productivity of both labor and land in the production of a small number of agricultural commodities which have important export potential; improving the marketing system for these commodities; and to strengthen the capability of units of the Ministry of Trade and Agriculture in gathering and disseminating information on agricultural production and marketing, and in program planning and monitoring.

Rationalization of the production process for the selected initial focus commodities (carrots, peanuts, and sweet potatoes) is designed to have widespread benefits for small holder agriculture. The principal focus of the Project is on improvement of productivity (labor and land) for small producers of the selected commodities, with possibility of spread effect if successful techniques are extended to additional products.

There is potential for altering the structure of agriculture as production methods are changed, due to the fact that some producers may be unwilling or unable to capitalize on the change process. Increasing capital intensity of production is intended to enhance productivity and thus, net returns to the producer; it also increases risk to the producer. Although such risk can be reduced by supervision of use of modern inputs obtained with credit financing, careful monitoring of the Project results will have to be attentive to the question of producer risks as well as to possible changes in the existing structure of agriculture.

The risks associated with the use of chemicals for weed, insect, and disease control in crop production have been explicitly considered. Although an information/training program for extension workers, growers and others directly involved in handling and using these chemicals should minimize their misuse, the risk of negative impact of use of these chemicals will be carefully monitored.

Project funds will be used to stimulate formation of the Pesticide Control Board which is specified in the 1973 Pesticide Control Act. The Project will provide funds to train two inspectors for implementing regulations under the Act. In addition, the GOSV shall designate a Pesticide Coordinator, from the Plant Protection Unit, to coordinate the implementation of the initiatives in pesticide monitoring, training and research specified in the pesticide procedures. The GOSV Pesticide Coordinator shall utilize existing expertise in health, and related MTA Agencies (Agriculture, Forestry, Fisheries) to implement programs that safeguard against unsound environmental practices, to ensure the safe and legal use of pesticides. The Pesticide Coordinator will be responsible for monitoring the correct distribution, storage, use and disposal of pesticides used in the Project. Although an information/training program for extension workers, growers and others directly involved in handling and using these chemicals should minimize their misuse, the risk of negative impact of use of these chemicals should be carefully monitored.

The objective of the Marketing Component of the Project is to seek out favorable markets for select commodities (carrots, peanuts and sweet potatoes), rationalize the movement of these products through the market channel to reduce losses in quality and quantity. As success is achieved with these initially selected commodities, it is the intent that the same procedures be applied to other commodities, so that the possibility for a spread effect is built in.

Rationalization of the marketing process is intended to increase returns to those small holders participating, and those benefits should be widespread, although not necessarily equally distributed.

The possibility of structural change exists and must be monitored. It is highly unlikely that either the production or marketing systems will shift significantly toward aggregation into larger firms in the short-run; the proposed new Census of Agriculture, will provide a benchmark for monitoring any such changes.

Since women constitute a substantial minority of producers, and virtually all of the traders (hucksters) who move produce from farms into the local and export markets; they (women) will figure centrally as beneficiaries of Project efforts; they will also be subject to risk as change occurs.

An unintended, but potential consequence of rationalizing the marketing and production processes may be that a significant fraction of the production of given commodities will be shifted in the direction of middle and upper income consumer markets. This could reduce the availability of lower quality but relatively cheaper produce to poorer consumers.

All these and other potentially negative impacts will have to be carefully monitored in the periodic evaluations of the Project.

The Data Gathering and Analysis Component of the Project will provide basic data to monitor Project activities. In particular, benchmark information will assist with determining the progress being made in meeting Project goals as well as monitoring potential negative impacts.

E. Environmental Assessment

An Environmental Assessment has been completed for the Project and is available as a background document.

The Assessment examined the potential environmental impacts for activities proposed under the Project. A detailed investigation of pesticide use was completed as part of the Assessment. The report recommends that safeguards be established regarding the use of pesticides to ensure against unreasonable environmental impacts. A comprehensive program for pesticide management is outlined and included the following:

1. identification and provision of specific pesticide products, application procedures, and safety precautions for incorporation in the Project;
2. appointment of a Pesticide Coordinator to monitor pesticide use in the Project and to coordinate training, extension, and other Project activities required to ensure correct and safe use of pesticides;
3. development of a series of new in-country short courses in pesticide management and integrated pest management for agricultural extension workers, health officers, nursery crop protection workers and others; and
4. recruitment of two inspectors/trainers to assist in the development and implementation of pesticide regulations and enforcement procedures provided in the Pesticide Control Act.

These activities will be developed throughout the Project in cooperation with the Government of St. Vincent. Utilizing the provisions of the Pesticide Control Act of 1973, the Government will establish a Board to develop regulations and enforcement procedures for pesticide use.

The Project will provide resources and the opportunity to implement the activities provided for by the Pesticide Control Act, through training of enforcement personnel.

VII. EVALUATION ARRANGEMENTS

During the course of the Project a progress evaluation and financial audit will be conducted at the end of the first year and a more comprehensive evaluation will be conducted immediately preceding the completion of the Project. The purposes of the first evaluation and audit will be : (1) to assess the progress of each of the three Project elements in terms of the criteria set out in the log frame, particularly with respect to purpose, outputs and inputs; (2) to examine the suitability of these criteria for the later final evaluation and to prepare a final evaluation plan; (3) to recommend mid-course corrections; and (4) to assess that acceptable record keeping and financial management procedures are being maintained by ORD and other implementing agencies and make appropriate recommendations regarding improvement to the accounting systems being used for financial management of Project funds. The purpose of the final evaluation will be to: (1) critique the design and implementation of the Project; and (2) to draw implications for future projects in St. Vincent and the Grenadines and the Eastern Caribbean.

The first evaluation will be managed by the Project Coordinator and will be an in-house review facilitated by regional experts in applied research, marketing and information systems, possibly involving 'WI, CARDI, CATCO, private importers in Trinidad, and IICA. US\$10,000 is budgeted.

The second evaluation will be managed by RDO/C and will incorporate Project staff, some of the regional experts mentioned above, and possibly experts from outside the Region. US\$30,000 is budgeted.

ACTION AID INFO AMB DCM CERON

ANNEX A
PAGE 1 OF 3

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FP RUEHWN
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P 220207Z JAN 83
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BT
UNCLAS STATE 020002

22 JAN 83
TOR: 0451
CN: 01837
CHRG: AID

JAN 24 1983

ADM AID

E.O. 12356: N/A

TAGS:

SUBJECT: ST. VINCENT AGRICULTURAL PROGRAM (538-0101) PID

THE BUREAU'S DAEC CONVENED ON JANUARY 13, 1983 TO REVIEW SUBJECT PID. THE PID IS HEREBY APPROVED AND PP MAY BE DEVELOPED AND APPROVED IN THE FIELD SUBJECT TO GUIDANCE SET FORTH BELOW.

2. USE OF THE PRIVATE SECTOR: THE FINAL PROJECT DESIGN DEVELOPED BY THE MISSION SHOULD ENSURE THAT THE PRIVATE SECTOR IS RESPONSIBLE FOR IMPLEMENTING AS MANY OF THE PROJECT COMPONENTS AS POSSIBLE. SPECIFICALLY, THE MISSION SHOULD ASSESS THE FEASIBILITY OF:

--A.-- INVOLVING PRIVATE FIRMS IN THE INTRODUCTION AND DISSEMINATION OF AGRICULTURAL TECHNOLOGY AS AN ALTERNATIVE TO THE EXCLUSIVE RELIANCE ON GOVERNMENT EXTENSION ACTIVITIES. THE MODELS OF THE LAAD ALCOSA PROJECT AND THE BRITISH AMERICAN TOBACCO COMPANY WERE SUGGESTED AS MERITING PARTICULAR STUDY FOR POSSIBLE REPLICATION IN THE PROPOSED PROJECT.

-P. MINIMIZING THE MONOPSONY ROLE OF THE ST. VINCENT MARKETING CORPORATION IN THE EXPORT OF CARROTS AND SWEET

POTATOES AND ENCOURAGING THE EQUITABLE PARTICIPATION OF PRIVATE TRADERS IN THE EXPORT MARKETING SYSTEM. IF THESE TRADERS ARE UNABLE TO FULLY PARTICIPATE BECAUSE OF THE UNIQUE GOVERNMENT TO GOVERNMENT COMMODITY ARRANGEMENTS OF THE AGRICULTURAL MARKETING PROTOCOL, THE MISSION SHOULD: (1) INDICATE HOW WORKING WITH THE MARKETING CORPORATION WOULD NOT ENCOURAGE THE EXTENSION OF ITS ROLE TO OTHER CROPS; (2) OFFER A PLAN FOR PHASING OUT ITS EXCLUSIVE ARRANGEMENT IN THE MARKETING OF CARROTS AND SWEET POTATOES; AND (3) IDENTIFY AN INTERIM MECHANISM FOR ASSURING THAT FARMGATE PRICES ARE NOT NEGATIVELY AFFECTED BY THE MARKETING CORPORATION'S MONOPSONY POWER AND THAT CONSUMER PRICES ARE NOT INCREASED TO COVER ITS ELATED MARKETING COSTS.

--C. IMPLEMENTING THE CREDIT COMPONENT THROUGH THE EXISTING PRIVATE MARKETING SYSTEM. IF THIS IS NOT POSSIBLE, THE MISSION SHOULD PROVIDE A JUSTIFICATION WHY

ACTION	INFO
Dir	<input checked="" type="checkbox"/>
A/Dir	<input checked="" type="checkbox"/>
PROG	
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DI	1/25/83
TAM	N/A
SP	WR
	1/24/83

62

THIS ISN'T FEASIBLE.

ANNEX A
PAGE 2 OF 3

3. SUSTAINABILITY OF THE CREDIT PROGRAM: THE EXISTING EVIDENCE OF NEGATIVE REAL INTEREST RATES AND A POSSIBLE DEFAULT PROBLEM AT THE NDE RAISES QUESTIONS ABOUT THE LONG-TERM VIABILITY OF THE CREDIT SYSTEM OUTLINED IN THE PID. DURING INTENSIVE REVIEW, THE MISSION SHOULD ANALYZE THESE PROBLEMS AND INDICATE ACTIONS TO MITIGATE THEM.

4. CREDIT MECHANISM: THE DESIGN OF THE CREDIT MECHANISM SHOULD FOR EXAMPLE: EMPLOY SIMPLIFIED LOAN APPLICATION PROCEDURES, BE CLOSELY COORDINATED WITH EXTENSION PROCEDURES, BE CLOSELY COORDINATED WITH EXTENSION ACTIVITIES, AND, WHERE POSSIBLE, WORK IN CONJUNCTION WITH THE PRODUCER ASSOCIATIONS.

5. SOCIO/ECONOMIC ANALYSIS: DURING INTENSIVE REVIEW, THE SOCIO/ECONOMIC ANALYSIS SHOULD BE REFINED TO REFLECT THE ROLE OF WOMEN IN THE AGRICULTURAL SECTOR. THIS ANALYSIS SHOULD INCLUDE INFORMATION ON HOUSEHOLD INCOME AND CONSUMPTION PATTERNS, THE SEXUAL DIVISION OF LABOR, AND POSSIBLE IMPACTS OF AN INCREASE IN FARM INCOME AND AN UPGRADING OF THE MARKETING MECHANISM ON SMALL FARMERS AND MARKET TRADERS.

6. PROJECT AUTHORIZATION: IF THE MISSION AND GOSV ARE UNABLE TO REACH SATISFACTORY AGREEMENT ON THE ROLE OF THE PRIVATE SECTOR IN THE MARKETING SCHEME AND ON THE SUSTAINABILITY OF THE CREDIT PROGRAM (DISCUSSED IN PARAS. 2 & 3 ABOVE), IT SHOULD CONFER WITH THE BUREAU PRIOR TO AUTHORIZING THE PROJECT IN THE FIELD.

7. AS MISSION AWARE, BUREAU HAS ESTABLISHED JUNE 30, 1983 AS DEADLINE FOR AUTHORIZING/OBLIGATING FY 83 PROJECTS. THEREFORE, MISSION SHOULD MAKE EVERY EFFORT TO COMPLETE INTENSIVE REVIEW AND AUTHORIZE/OBLIGATE PROJECT PRIOR TO THIS DEADLINE.

8. FYI: ALL IAC MISSION APPROVALS ARE SUBJECT TO BUREAU REVALIDATION IF POST-PID PROJECT DEVELOPMENT PROCESS EXTENDS BEYOND ONE YEAR. END FYI. SHULTZ
PT

UNCLASSIFIED

STATE 041268

ACTION AID INFO AMB DCM CHRON

ANNEX A
PAGE 3 OF 3

VZCZCWNO296
RR RUEHWN
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UNCLAS STATE 041268

FEB 13 1984

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CN: 01739
CHRG: AID
DIST: AIDA

AIDAC

E.O. 12356: N/A
TAGS: N/A
SUBJECT: REVALIDATION OF PID: ST. VINCENT AGRICULTURAL
DEVELOPMENT PROJECT NO. 538-0101

SINCE NO SUBSTANTIAL CHANGES HAVE OCCURRED IN SUBJECT
PID, LAC REVALIDATES BUREAU APPROVAL FOR PROJECT
AUTHORIZATION AT THE MISSION. SHULTZ
BT
#1268

UNCLASSIFIED

STATE 041268

ACTION	INFO
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DIR	✓
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AGRI	
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TAKER:	NAR
SIGN:	Trilles Bawean
	2/22/84

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: St. Vincent Agricultural Development Program

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><u>SV Agricultural Sector Goal</u></p> <p>- To strengthen and diversify small farm agriculture and increase agricultural production and foreign exchange from a diversified base.</p>	<p>1/</p>	<p>1/</p>	<p>- Agricultural sector development remains high priority of GOSV.</p>
<p><u>Project Goal</u></p> <p>- To increase net incomes of small farmers and increase foreign exchange earnings from agriculture.</p>	<p>1/</p>	<p>1/</p>	<p>- GOSV will adopt policies for incentives to support private initiative in expanding agriculture and marketing improvement activities.</p>
<p><u>Project Purpose</u></p> <p>1. To increase productivity of small farm agriculture and to assure that the producers participate in economic benefits therefrom.</p> <p>2. To improve efficiency in marketing and to expand markets for commodities produced in small-holder systems.</p> <p>3. To strengthen the capability of the agricultural sector to perform more effective program planning, implementation, and monitoring.</p>	<p>1/</p>	<p>1/</p>	<p>1. Growers will respond to incentives to adopt improved technology.</p> <p>2. Grower organizations will be able to effectively supervise production.</p> <p>3. Private sector will respond to marketing improvement incentives, and will adapt individual operations to take advantage of benefits.</p> <p>4. Regional and export markets will be found for commodities produced.</p>
<p><u>Outputs</u> 1/</p>	<p>1/</p>	<p>1/</p>	<p>1/</p>
<p><u>Inputs</u> US\$'000</p> <p>Production Support 393</p> <p>Marketing Support 530</p> <p>Policy & Planning 1,155</p> <p>Inflation & Contingency 276</p> <p>TOTAL 2,354</p>			

1/ See relevant component sub-log frame

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: St. Vincent Agricultural Development: Agricultural Production Component

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS														
<p><u>Project Component Goal</u></p> <ul style="list-style-type: none"> - To increase productivity of small farm agriculture and to assure that the producer's share in the economic benefits therefrom. 	<ul style="list-style-type: none"> - Increased production (yield) per acre for project commodities. - Increased net return for producers. 	<ol style="list-style-type: none"> 1. Annual Statistics of St. Vincent MTA. 2. Project monitoring activities. 	<ul style="list-style-type: none"> - CARDI and MTA Research identifies appropriate technology (varieties, soil amendments, pesticides) for St. Vincent conditions. - Growers will respond to incentives to use improved technology. - Growers will be able to sell all products produced. 														
<p><u>Project Purposes</u></p> <ul style="list-style-type: none"> - To increase productivity of onions, peanuts, sweet potatoes and carrots grown by small farmers. - To assure that participating producers realize economic benefits from increased productivity. 	<ul style="list-style-type: none"> - Increased pounds per acre harvested by growers for peanuts, sweet potatoes and carrots. - Increased producer net returns per acre for onions, peanuts, sweet potatoes and carrots. 	<ol style="list-style-type: none"> 1. GOSV annual statistics. 2. Grower Organization records. 3. Project records and evaluations. 	<ul style="list-style-type: none"> - Improved technology and inputs are available to farmers on timely basis. - Growers use production inputs properly. - Growers cooperate with post-harvest handling, grading requirements. 														
<p><u>Outputs</u></p> <ol style="list-style-type: none"> 1. Acreage planted of carrots, peanuts and onions will increase by over 30 percent. 2. Yields per acre of sweet potatoes, carrots, peanuts and onions will increase by over 75 percent. 	<ol style="list-style-type: none"> 1. Number of acres planted by crop. 2. Pounds of product harvested by crop. 3. Pounds and value of products marketed. 	<ol style="list-style-type: none"> 1. GOSV (MTA) annual agricultural statistics. 2. Grower Organization records. 3. Project records and evaluations. 															
<p><u>Inputs</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="text-align: right; border-bottom: 1px solid black;">US\$ '000</th> </tr> </thead> <tbody> <tr> <td>1. Research Facilities & Support</td> <td style="text-align: right;">139</td> </tr> <tr> <td>2. Research Field Operations</td> <td style="text-align: right;">69</td> </tr> <tr> <td>3. Short-Term T.A.</td> <td style="text-align: right;">85</td> </tr> <tr> <td>4. Production Input For Farmers</td> <td style="text-align: right;">100</td> </tr> <tr> <td>5. Contingency & Inflation</td> <td style="text-align: right; border-bottom: 1px solid black;">86</td> </tr> <tr> <td style="text-align: right;">TOTAL</td> <td style="text-align: right;">479</td> </tr> </tbody> </table>		US\$ '000	1. Research Facilities & Support	139	2. Research Field Operations	69	3. Short-Term T.A.	85	4. Production Input For Farmers	100	5. Contingency & Inflation	86	TOTAL	479			
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3. Short-Term T.A.	85																
4. Production Input For Farmers	100																
5. Contingency & Inflation	86																
TOTAL	479																

69

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project _____
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: St. Vincent Agricultural Development: Marketing Component

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS														
<p><u>Project Component Goal</u></p> <p>- To increase foreign exchange earnings from small-holder system agricultural exports.</p>	<p>- The volume and value of non-traditional agricultural commodity exports.</p>	<p>- National export records and statistics.</p>	<p>- St. Vincent continues to have access to CARICOM markets.</p>														
<p><u>Purpose</u></p> <p>- Expand markets; and</p> <p>- Improve marketing efficiency for commodities produced in these systems.</p>	<p>1. St. Vincent products (project commodities) are regularly supplied to CARICOM markets.</p>	<p>1. CARICOM nations; and</p> <p>2. Project records and evaluations.</p>	<p>1. Growers will respond to incentives to use recommended technology.</p>														
<p><u>Outputs</u></p> <p>1. Improved packing facilities constructed.</p> <p>2. Improved packaging and handling of fresh production.</p> <p>3. Market prices system in operation.</p>	<p>1. Certification of construction completed.</p> <p>2. Produce being shipped by improved methods.</p> <p>3. Number, frequency, and quality of reports and prime information published.</p>	<p>1. Official documents.</p> <p>2. Records of Growers Organization.</p> <p>3. Project records and evaluations.</p>															
<p><u>Inputs</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: right;"><u>US\$'000</u></th> </tr> </thead> <tbody> <tr> <td>1. Packing Facilities</td> <td style="text-align: right;">165</td> </tr> <tr> <td>2. Commodities</td> <td style="text-align: right;">46</td> </tr> <tr> <td>3. Marketing Info.</td> <td style="text-align: right;">19</td> </tr> <tr> <td>4. Technical Assistance</td> <td style="text-align: right;">300</td> </tr> <tr> <td>5. Inflation & Contingency</td> <td style="text-align: right;"><u>90</u></td> </tr> <tr> <td style="text-align: right;">TOTAL</td> <td style="text-align: right;">620</td> </tr> </tbody> </table>		<u>US\$'000</u>	1. Packing Facilities	165	2. Commodities	46	3. Marketing Info.	19	4. Technical Assistance	300	5. Inflation & Contingency	<u>90</u>	TOTAL	620			
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TOTAL	620																

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PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Life of Project: _____
 From FY _____ to FY _____
 Total U.S. Funding _____
 Date Prepared: _____

Project Title & Number: St. Vincent Agricultural Development: Data Gathering & Analysis

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																				
<p><u>Project Component Goal</u></p> <p>- To increase net incomes of small farmers and increase foreign exchange earnings from small-holder agriculture.</p>		<p>1. GOSV statistics record. 2. Project monitoring activities.</p>																					
<p><u>Purpose</u></p> <p>- To strengthen the capability of the agricultural sector to more effectively carry out program planning, implementation and monitoring.</p>																							
<p><u>Outputs</u></p> <ol style="list-style-type: none"> 1. Sample Frame. 2. Agriculture Census. 3. Forecast Reports. 4. Special Studies & Surveys. 5. Imple. & Monitoring of This Project. 6. Improved Professional Skills. 7. Improved Working Facilities. 	<ol style="list-style-type: none"> 1. Sample Frame Documentation. 2. Census Documentation. 3. Forecast Reports. 4. Survey & Study Reports. 5. Summation of Rest. of Indicators. 6. Improved Quality of APU Products. 7. Space & Quality of Space Avail. 	<p>1. Project records and evaluation official documents.</p>																					
<p><u>Inputs</u></p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: right;">US\$ '000</th> </tr> </thead> <tbody> <tr><td>1. Personnel</td><td style="text-align: right;">215</td></tr> <tr><td>2. T.A. (Long-Term)</td><td style="text-align: right;">510</td></tr> <tr><td>3. T.A. (Short-Term)</td><td style="text-align: right;">120</td></tr> <tr><td>4. Equipment</td><td style="text-align: right;">87</td></tr> <tr><td>5. Office Expansion</td><td style="text-align: right;">165</td></tr> <tr><td>6. Project Evaluation</td><td style="text-align: right;">43</td></tr> <tr><td>7. Pesticide Safety</td><td style="text-align: right;">15</td></tr> <tr><td>8. Inflation & Contingency</td><td style="text-align: right;">100</td></tr> <tr><td>TOTAL</td><td style="text-align: right;">1,255</td></tr> </tbody> </table>		US\$ '000	1. Personnel	215	2. T.A. (Long-Term)	510	3. T.A. (Short-Term)	120	4. Equipment	87	5. Office Expansion	165	6. Project Evaluation	43	7. Pesticide Safety	15	8. Inflation & Contingency	100	TOTAL	1,255			
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TOTAL	1,255																						

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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.

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;

(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

(a) A Congressional Notification has been prepared

(b) 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?

(a) Yes.

(b) 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 further legislation action is required

4. FAA Sec. 611(b); FY 1982
Appropriation Act Sec.
501. If for water or water-related land

N/A

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. **The project is not appropriate for regional execution**
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) **The Project will promote an integrated production and marketing program for selected commercial food crops and develop institutional planning capabilities within the Ministry of Trade and Agriculture. As such it will encourage Governments efforts in (a), (b) and (c).**

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). U.S. goods and services will be used in the project as appropriate.
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 host country is contributing staff, facilities and related support for the project.
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 No.

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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?

An Environmental Assessment has been prepared.

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)?

N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

N/A

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

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,

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
Criteria (loans Only)

N/A

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

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? N/A

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 No.
Is recipient country a communist country? 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?

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5. ISDCA of 1981 Secs. 724, 727 and 730. N/A
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
(a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters? No.
(b) If so, has any deduction required by the Fishermen's Protective Act been made? N/A
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 resources 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.) Yes.
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

bilateral assistance agreements been negotiated and entered into since such resumption?

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.) St. Vincent and the Grenadines payment status is current.
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.
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 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.) No

17. ISDCA of 1981 Sec. 721. See Special requirements for assistance to Haiti. N/A
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? N/A

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.

- 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.? N/A

- 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? N/A



ANNEX D

OFFICE OF THE PRIME MINISTER
SAINT VINCENT AND THE GRENADINES
WEST INDIES

19th June, 1984.

Mr. Ludlow Flower, III
Charge d'Affaires
US Embassy
P.O.Box 302
Bridgetown
BARBADOS

Dear Mr. Flower:

The purpose of this letter is to request that the United States Government assist the Government of St. Vincent and the Grenadines in its program of agricultural development by providing financial support for the St. Vincent Agricultural Development Project. The total project is estimated to cost US\$2,354 million of which we are requesting that the United States provide US\$2.0 million.

Agriculture is a major economic sector in St. Vincent and the Grenadines accounting for a large share of our exports, and most importantly, provides employment and livelihood for many of our people. My Government places a high priority on increasing the production and productivity of the agricultural sector which in turn will increase incomes and employment opportunities of rural families.

The elements of the Project for which we are requesting

/Grant

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Grant assistance include:

(a) Export Marketing:

Assistance is requested to construct a short-term storage shed for use by exporters awaiting ship loading, to make appropriate packaging materials available for sale to small volume traders, and to establish a small scale facility for medium-term storage of sweet potatoes.

(b) Production Technology:

Assistance is requested to enable an accelerated effort of testing improved varieties of selected crops, and to expand input availability to farmers through non-government producer organizations.

(c) Institutional Support:

Assistance is requested to conduct a national census of agriculture, to initiate crop forecasting services, and to expand the building facilities of the Ministry of Trade and Agriculture.

In conclusion, I wish to stress the importance my Government places on sustained agricultural growth as well as my Government's concern regarding the outlook for our traditional export crops. I believe our farmers will produce a more diverse range of commodities if they perceive reasonable market opportunities. The project for which we are requesting assistance will address key problems associated with marketing as well as those associated with production. In addition, essential services provided by the MTA will be strengthened to facilitate the efforts of the thousands of individuals engaged

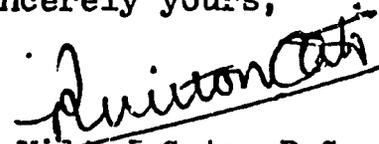
/in

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in the production and trade of agricultural commodities.

The Government of St. Vincent and the Grenadines assures the United States Government of its full cooperation in carrying out the Agricultural Development Project and its commitment to provide the direction, manpower, and other inputs required of us to achieve the objectives of the Project.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "R. Milton Cato", written over a horizontal line.

R. Milton Cato, P.C.
Prime Minister/Minister for
Finance.

ANNEX E

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. Vincent and the Grenadines 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. Vincent Agriculture Development Project.

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

(Signed)



William B. Wheeler
Director

(Date)

25 June 1984

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TECHNICAL ANALYSIS

1. Overcoming Constraints

The basic design of this project was conceived as part of the St. Vincent and the Grenadines Agricultural Sector Assessment written for RDO/C by the Midwest Universities Consortium for International Activities, Inc, and provides the technical rationale for the project elements.

In the analysis which follows the findings of that assessment are summarized. The nature of the technical constraints for each major project component are identified, the general feasibility of breaking the constraint will be addressed, and the design of an effective project component will be developed. The requirement which each component design must meet will be spelled out, a design recommended, and issues and alternatives considered will be discussed where appropriate.

2. Technology Generation

A. Varietal Constraints

Vincentian farmers are faced with many obstacles in attempting to optimize crop yield. Production must be undertaken on steep slopes and, in many instances, marginal soils having high acidity and phosphate deficiencies. Labor is sometimes in short supply and when available is relatively expensive (37% of total production cost in sweet potatoes, 55% in carrots and 46% in peanuts). While fertilizer and other inputs are sporadically available, the supply is limited and based on a parallel market with growers of banana and arrowroot selling their commodity specific fertilizer to farmers engaged in the production of other crops. In 1982 the Banana Growers' Association supplied over 3000 metric tons of NPK fertilizer to their members and the Arrowroot Association supplied 300 tons to their growers. This supply, in effect, comprised almost all of the commercially available fertilizer in St. Vincent. Insect and disease problems persist to different levels of severity in all crops and nematodes are an especially serious constraint in carrot production. Inadequate post harvest handling is a continuing problem in marketing, and especially apparent in sweet potatoes and carrots. These varied constraints interact to cause low yields and low commodity quality.

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Given the existing situation in St. Vincent, it is believed that a common barrier to improve productivity among the four commodities which are the focus of this project (peanuts, carrots, sweet potatoes and onions) is an absence of the proper, most suitable planting material. There is a high probability that 'better' varieties already are available internationally and can be identified for use in St. Vincent. In many cases currently used seed varieties and planting material are the same as was in use in the 1950's. For example, the most widely planted varieties of carrot are Danver's Half Long and Danver's 126, these were adopted after trials in St. Vincent conducted in 1959 - 60. Texas Grano and Granex varieties of onions developed in the U.S. in 1955 are presently being used in an MTA effort to increase local onion production. Sweet potato planting slips are generally passed from farm to farm and consist of mixture of 30 or so pure lines obtained from Barbados more than 20 years ago and now serve as the local planting material. Present work is showing the potential results from testing and selecting varieties having resistance to crop pests while also retaining a capacity to produce high yields of a superior quality. For example, peanut variety selection initiated by CARDI has shown that on-farm yields can be increased up to 75% by using an improved variety and providing adequate inputs. Evidence to support this finding has been recorded by CARDI and ORD in work with over fifty farmers. Greater productivity increases may still be possible through further collaboration with the world research community. Informed individuals have stated that carrots varieties currently exist which, through resistance to disease and nematodes, could substantially increase both yield and quality of production. There are similar possibilities in onion and sweet potato production. With the assortment of problems facing the farmer, the first step towards minimizing these constraints should include work to identify improved varieties for each crop.

B. Feasibility of Screening Activity

The screening of varieties of each commodity will be a key activity funded under the Project and will be a joint effort by the MTA Research Unit and the CARDI Country Team. The project will fund the upgrading of research facilities at the Camden Park Experiment Station. Office and storage space will be renovated, with one room to serve as the soil sample preparation and analysis area to determine first-order estimates of fertilizer requirements for field plots and on-farm demonstration lands. Soil testing equipment will be purchased and installed, storage space for orderly handling of samples will be provided. Mr. Charles Gunsam, the MTA Research Officer, has a B.S. degree in plants and soils from the University of Tennessee and will be responsible for conducting soil testing

activities. Fencing will be constructed to enclose the field trial sites at the Camden Park Station and at one other site, tentatively identified to be located at Keartons.

The project design calls for initial identification of improved varieties within 18 months after the project is mobilized. The time frame is feasible in that three growing cycles (five months per growing cycle) will be within this timespan and will allow planting and observation of three trials with each commodity. The three growing cycles during which field trials will be conducted over the life of the project will be as follows: 1st cycle - June/84 to October/85; 2nd cycle - November/84 to March/85; 3rd cycle - April/85 to August/85. The identification of one or two potentially superior varieties in each commodity group by March/85 will allow commencement of on-farm testing of these varieties in April of 1985 corresponding with the traditional start of crop planting activity. These demonstrations, which will be a form of extension of the research results to local farmers, will be integrated into the ongoing activities of the CARDI Farming Systems Project and MUCIA/UWI Agriculture Extension Project. By September of 1985, varietal recommendations for general use will be made by the MTA Research Unit and CARDI personnel. At this time, the MTA Extension Unit will begin a campaign to inform the producers of the new varieties, and commercial seed supply stores and farmer organization distributing seeds will be encouraged to stock these new varieties. In this way, widespread use of new varieties will be initiated during the last 12 months of the project.

C. Design of Research Activity

The screening program will be divided in three phases, a) planning and selection of technology, b) testing and analysis and c) analysis of data and recommendation. The planning phase will include identification and acquisition of seed material and upgrading of MTA research facilities and equipment purchases. Testing will involve designing field trials for each commodity, specifying the desirable characteristics to be screened for and conducting the trials through at least three growing cycles of five months each. The analysis of data will be reviewed at the completion of each trial and the number of suitable varieties narrowed so that by the end of the second growing cycle only one or two varieties remain for use in on-farm trials.

Requirements

The MTA will allocate research personnel, land and office space at Camden Park for this activity. The role identified for the

CARDI country team is to provide technical expertise, to assist the MTA Research Unit to identify and acquire seed material for testing, to help identify desirable characteristics for screening in each commodity, to select the experimental design for statistical analysis of the data and to implement the actual experimental trials including the cost of consumable supplies and casual labor. The CARDI country team consist of the following staff:

- 1) Country Team Leader
- 2) Agronomist
- 3) Plant Pathologist
- 4) Postharvest Technology Advisor
- 5) MTA Extension Counterpart
- 6) Two Agricultural Technicians

The Three individuals identified by CARDI to assist most closely in this project are the agronomist, the plant pathologist and the Country Team Leader.

These CARDI personnel are also involved with other on-going activities of CARDI that complement the project proposed research. These activities include weed control techniques in carrots, crop rotation for nematode control in carrots, control of sweet potato weevil, off season production of sweet potato and crop protection for carrots and other vegetables. CARDI will be responsible for the actual conduct of field plots during the first and second growing cycles, as well as on-farm trials as appropriate. Demonstrations of improved varieties under farmer management will be the responsibility of the MTA Extension Unit. As the technology investigation moves from station trials, to on-farm trials, to farmer demonstration, the needed collaborative linkage between research personnel, extension personnel, and farmers is well established. The first trial should be underway by June of 1984 and timely completion of a trial every five months is expected to be maintained.

Desirable varietal characteristics are described below.

Sweet Potatoes

Red skin, long storage life, firm white flesh for Trinidad market, high yield, resistance to sweet potato weevil (long stalk will help prevent attack) and cropping ability throughout the year.

Onions

Medium size, white flesh, not too pungent, long storage life, high yield and short growing season.

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Carrots

Resistance to nematodes, blight and crown rot, high yield, long cylindrical root, orange flesh with resistance to storage loss.

Peanuts

High yield and short growing season.

Anticipated Schedule of Events

March - June, 1984

During the first two years of the project, four major activities will be undertaken;

a) Seed Material

CARDI, MTA and short-term technical assistance will identify and acquire varietal material for each commodity,

b) Essential Fencing and Equipment

Field sites at Camden Park and Kertons will be fenced. Soil testing and research equipment will be specified and ordered,

c) Design

The trials will be designed and statistical analysis planned by CARDI and MTA, and

d) Varietal Characteristics

The criteria of the desirable varietal trials will be determined by CARDI and MTA.

July - November, 1984

The first series of station trials will be conducted at Camden Park. The MTA Research Officer will collaborate with CARDI in laying out field plots and establishing methodology for data collection during the trial. Analysis of the data will be used to narrow the number of varieties to be used in the second cycle.

Renovation and organization of office space at Camden Park will be accomplished.

December, 1984 - April, 1985

The second series of station trials will begin with a smaller number of varieties. The MTA Research Officer in consultation with CARDI personnel select one to four varieties for use in on-farm trials.

May - September, 1985

On-farm trials will be collaboratively conducted by CARDI and the MTA Extension Unit. This activity will be the beginning of extending the results of the first two station trials. Analysis of the data from the first on-farm trial will be the basis of recommending a particular variety for islandwide use.

3. Inputs Provision

A. Constraints

Vincentian farmers, producing crops other than bananas and arrowroot, are faced by two constraints in regard to production inputs; a) physical unavailability of the proper inputs, (principally fertilizer), and b) limited access to small scale production credit.

There is very limited private activity to import and sell fertilizers or pesticides. Geddes Grant, Ltd., Greenfingers and the St. Vincent Marketing Corporation sell small quantities of fertilizer and seed, but the volume is very low. The major importer of inputs is the BGA, which, in 1982, imported and sold over 80,000

bags of fertilizer. Other major sources of fertilizer that year were the Arrowroot Association and ORD, supplying 6,000 bags and 700 bags, respectively. The chemical formulation of these fertilizers was designed for optimal banana and arrowroot production. This formulation does not generally correspond to the fertilizer requirements of other crops and in the case of onions and carrots does not provide the necessary amounts of phosphorous. Improved seed types are also an input that is not readily available to farmers. CARDI trials have demonstrated that the use of proper fertilizer and pesticides can increase crop yields of traditional varieties by 50 to 80 percent. Test results also show that improved varieties used in conjunction with proper inputs can more than double "normal" yields (i.e., peanut fields trials with NC2).

Small farmers involved in vegetable or legume production have limited access to credit due to the scale of their activities. Only small loan amounts, between US\$100 and US\$300, are typically needed by most food crop farmers and these transactions are difficult for traditional lending institutions to effectively service. Other than the commodity associations, credit institutions are limited to the Development Corporation (DEVCO) and commercial banks. During 1983, DEVCO's loans in the agriculture sector averaged over US\$3,000 each. The commercial banks have been reluctant to arrange small loans and while applications are accepted the rate of approval has been low. This situation caused Organization for Rural Development to start a limited program of credit in-kind for small farmers, which provided almost US\$10,000 in loans to over 75 farmers in 1983.

B. Design

The Project will support an expansion of small loan activities by providing US\$100,000 for use by ORD, subject to MTA approval and AID concurrence, to procure agricultural production inputs. The program will be a credit in-kind system for farmers producing peanuts, carrots, sweet potatoes and onions. A memorandum of understanding between ORD and the MTA will be written to: a) outline the role and responsibilities of each entity, b) describe funding and accounting systems to be used, and c) establish guidelines for monitoring the program.

ORD will be responsible for importing and distributing inputs under a credit in-kind system with the approval of the Minister. ORD will detail the amount and type of fertilizer and pesticides to be procured, the acreage of each crop, the pricing of inputs, and the terms of credit. The MTA Chief Technical Officer and MTA economist will review the technical aspects of the proposal

for adherence to current cultural recommendations prior to review by the Minister. ORD will establish a separate bank account for deposit of funds generated from the sale of inputs and provide quarterly reports on loan activity to the Project Coordinator, who will be charged with monitoring the credit program.

The mechanics of the credit program will be the following; a) approved commodities will be imported by ORD and transported directly to their eight storerooms in the interior, b) participating farmers will pay 25% down on inputs needed and be charged 1% interest each month of the loan, c) ORD field workers will secure loan repayments at harvest time, and d) all funds generated will be placed in a separate account to fund the purchase of more inputs. The US\$100,000 budgeted for initial purchase of fertilizer, pesticides and seed, will be sufficient to provide inputs for the targeted acreage in each crop. The revolving credit program will be initiated in the first year of the Project and provide the inputs and credit required for the increased acreage to be obtained by the end of Project activities. Once new seed varieties have been identified, midway through the project time frame, ORD will purchase the improved seed for inclusion in their established inputs provision program.

C. Requirements

For planning and design purposes an approximation of the amount of inputs needed will be based on current CARDI and MTA recommendations for each crop. The following tables list three inputs per acre and their cost in St. Vincent.

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ONIONS

US\$

Pest Control

Weeds	- 1/2 gal. gramoxone @ \$21.00/gal.	\$ 10.50
	- 12 lbs. dacthal @ \$4.50/lb.	\$ 54.40
Insects	- Decis, Besudin or Malathion	\$ 37.00
Fungi	- 2 lbs. of Benlate or Dithane M4J @ \$8.50/lb.	\$ 17.00
Nematodes	- 25 kgs of Furadan	\$ 65.00

Fertilizer

NPK (12:12:17)	250 lbs./acre @ .15/lb	\$ 38.00
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Total Cost for Input/Acre US\$221.50

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93

PEANUTS

US\$

Pest Control

- Weeds - 80 oz. Lasso
@ \$58.00/gal. \$ 30.00
- Insects - Decis, Besudin \$ 19.00
- Nematodes/Soil insects - Primicide
25 ozs. @ \$50.00/gal. \$ 10.00
- Rodent Control (rat baits) \$ 13.00

Fertilizer

- NPK (16-8-16) 220 lbs./acre
@ .15/lb \$ 34.00

Lime

- CaCO_3 280 lbs./acre
@ .13/lb. \$ 36.00

Gypsum

- 120 lbs./acre
@ .13/lb. \$ 17.00

Total Cost for Inputs/Acre US\$159.00

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CARROTS

US\$

Pest Control

- Weeds - 1/2 gal. gramoxone
@ \$21.00/gal. \$ 10.50
- Nematode Control - 1 bag of furadan
@ \$170.00 \$170.00
- Fungi Control - 2 lbs. benelate
@ \$22.00/lb \$ 44.00

Fertilizer

- NPK (12:12:17) - 250 lbs./acre
@ .40/lb. \$100.00

Total Cost of Inputs/Acre US\$341.50
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SWEET POTATOES

	US\$
<u>Pest Control</u>	
- Weeds - 1/2 gal. of gramoxone @ \$21.00/gal.	\$10.50
- Soil Insecticide/potato grub 30 oz. primicide @ \$50/gal	\$ 9.00
- Rodent Control (rat baits)	\$13.00
<u>Fertilizer</u>	
NPK (8-8-16) 220 lbs./acre @ .15/lb.	<u>\$34.00</u>
Total Cost/Acre of Inputs	US\$66.50 =====

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Project funds will be adequate to provide inputs for the following acreage per crop for one season:

- a) Peanuts - 250 acres @ US\$159.38/acre - US\$39,846;
- b) Onions - 30 acres @ US\$221.88/acre - US\$6,654;
- c) Carrots - 132 acres @ US\$131.34/acre - US\$17,338; and
- d) Sweet potatoes - 500 acres @ US\$67.12/acre - US\$33,558

This will provide a total of US\$97,415 leaving a fund US\$7,692 available for purchase of seed of carrots onions and peanuts when improved varieties of these crops are identified. This amount would furnish 132 acres of carrot seed (2 lbs./acre @ US\$8.00/lb., US\$2,031), sufficient onion seed for 30 acres (5 lbs./acre, @ US\$8.00/lb., US\$1,154), peanut seed for 250 acres (20 lbs./acre, US\$.77/lb., US\$3,846). Planting slips of improved varieties of sweet potatoes will be provided through multiplication of the variety in fields during the CARDI on-farm trials. Part of the revolving fund of the farmers groups will be used to purchase and distribute these sweet potato planting slips.

4. Marketing

A. Opportunities and Constraints

St. Vincent has a well established history of fresh produce export to near-by regional markets. More recently, a modest volume of fresh produce has been shipped to extra-regional markets via the schedule "banana boats" as well as on air freight services. For the commodities that are the focus of this project, Trinidad is the most important market. Trinidad is reported to import on an annual basis, more than 8,000,000 pounds of carrots, 5,700,000 pounds of peanuts, 14,000,000 pounds of onions, and 10,000,000 pounds of sweet potatoes. Since the production goals for the commodities under this project represent less than half the Trinidadian import requirements, the market potential clearly exist. Moreover, in the case of carrots and peanuts, St. Vincent has in the past successfully captured a larger share of the Trinidadian market than is currently the case. There is reason to believe that St. Vincent can build on tradition and recapture a larger market share if outstanding constraints are attended.

The major constraints regarding markets involve post-harvest quality deterioration, reliability of supply, and export licencing requirements that restrain free market activity. While there are a number of contributing factors to poor post-harvest quality, a constraint that faces all persons engaged in export produce trade is

the absence of short-term storage in Kingstown in which to assemble commodities prior to shipment. These pre-shipment assembly and preparation activities are carried out in the open weather with no protection from the direct exposure to the sun and rain. These preparations must be carried out in a short period of time due to the inherent lack of keeping quality under ambient conditions. This gives rise to hectic and rough handling which causes further damage, promoting decay and quicker deterioration.

Another problem common to all traders is the ready availability of appropriate packing material. The produce, which is usually not graded, is packed in containers consisting of bags, boxes (wooden and cardboard), cartons, crates and baskets of all various sizes, often of used and condition. These containers are then tightly packed into inter-island schooners, which are poorly ventilated.

With regard to reliability of supply, most traders are "spot-traders" who pay little attention to forward market planning. This is true in part because production forecasting and market price information is not routinely available from any source. This has implications for all traders both individually and collectively. The lack of clear price signals to guide farmers to make marketing decisions contribute to distortion and confusion in the market system. The result is unreliable supplies which at times causes glut and at others complete unavailability of commodities.

For historical reasons related to CARICOM trade agreements, certain commodities (including carrots, sweet potatoes, and peanuts) have been specified as controlled by the GOSV, and private traders can export these commodities only with permission (licenses) of the St. Vincent Marketing Corporation. In effect, this gives the SVMC a monopsony for most of the items with the largest regional export trade volumes.

The monopsony is operated within a fairly ridged structure of administratively determined prices which frequently do not take into account market supply and demand forces. The result has been a decline in trade volumes of these specified commodities because both farmers and market buyers are dissatisfied.

B. Feasibility of Change

Traders of fresh agricultural produce, perhaps more than any other group of merchants, are very sensitive to changes in the market system and are relatively quick to respond to perceived shifts in price, form, time and space utility. Hence, it is

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reasonable to conclude that traders will adopt different behaviors if the perceived benefits are sufficiently attractive. A major problem in adopting different methods to reduce post-harvest quality losses is that it is difficult for any individual trader to sufficiently capture the benefits of the change. This is often cited as a rationale for more control of the market by government or quasi-governmental bodies. An alternative, proposed in this project, is to foster certain services that resolve problems common to all traders and rely on enlightened self-interest to prompt the desired behavioral changes on an individual basis. For example, an absence of short-term storage/assembly area at the port is a common problem for all export produce traders. Likewise, the unavailability of appropriate packing materials forces most traders to rely on used containers of assorted configurations. These two conditions promote rough handling, discourage proper sorting or grading, and inhibit needed stacking to allow optimal air flows. The attending of these two problems is not likely to cause any dramatic reduction in post-harvest deterioration, but it will result in a marginal improvement. This improvement in turn will re-inforce the traders to take greater care in handling produce prior to arriving at the port, and hence an additional small improvement is made. Likewise, consistently sized packages will make it easier for ship personnel to accomplish orderly stacks in the ship hold, and again a small marginal improvement is achieved. Added together, these changes will noticeably improve the quality of produce reaching the market buyers and competitive advantage is enhanced.

During the design of this project, the feasibility of introducing short-term cool storage was considered and rejected. First, the cost of erecting cool storage was relatively high and rental fees would have to be very high relative to ambient storage. Second, informal discussions with traders indicate that in the absence of cool storage aboard ships, cool storage at the port would not be utilized by them. Thus, unlike the two changes discussed previously, the introduction of refrigerated storage is probably feasible if introduced into several links of the market channel.

Experience has demonstrated that state control of export produce marketing through the St. Vincent Marketing Corporation has not achieved the satisfactory results intended. Market share has eroded, market buyers have been very vocal in their dissatisfaction with quality, and farmers have significantly reduced production of some commodities - notably carrots. The GOSV and the SVMC are aware and concerned about this situation, although they are not confident that private traders will perform better if left totally uncontrolled. Nevertheless, there is a willingness to experiment with alternative arrangements. This project proposes to "de-specify" carrots, peanuts, and sweet potatoes from control of the SVMC and allow private traders free range to export. The SVMC

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will not ignore this trade however, instead it will undertake to provide services to assist the private traders by renting improved storage space, selling appropriate packing material, providing practical technical services on sorting and packing techniques, and publishing timely price information from target markets. The GOSV has agreed to this arrangement in principal and is willing to experiment with assistance through this project.

C. Recommended Design

The marketing component will consist of executive action by the GOSV Cabinet to "de-specify" SVMC control of carrots, peanuts, and sweet potatoes; actions by the SVMC to construct and operate a 10,000 ft² covered short-term storage/necessary area; action by the SVMC to stock and sell appropriate packing material for export commodities; action by the SVMC to establish weekly publication of market price information from Trinidad and other regional markets; and action by the GOSV to secure the services of an experienced export trade expert to work directly with private traders to solve practical problems related to export sales.

All of these actions are feasible and suitable to the situation in St. Vincent. Preliminary engineering drawings and specifications for planned construction is on file in RDO/C offices. The SVMC has sufficient existing facilities and capability to perform the packing sales and market information services.

Recurrent cost of storage and packing sales will be covered by revenue generated by these services. Technical services will be funded by the AID Grant for a period of 24 months and discontinued thereafter. The market news services will be indicated by a Peace Corp volunteer already in place, and the SVMC has already budgeted resources to continue this service over the longer run. Thus, the provision of the market news services is the only recurrent expense that will need sustained support from the budget of the SVMC after the project is finished.

5. Agricultural Data Gathering and Analysis

A. Data Constraints to Integrated Production and Marketing

The production and marketing of bananas, and arrowroot, are fairly well integrated in St. Vincent and are carried on at level of sophistication which has allowed the state to participate in the world market for these commodities. For procedures and traders in a

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small state to become and remain competitive is a demanding task, one which requires ingenuity, flexibility, and a market orientation. As an instructive example, a banana breeding program, conducted in Jamaica for about thirty years, had been breeding bigger bananas and bananas resistant to a variety of diseases. A few years ago when marketing tests were conducted on the forty plus varieties developed over thirty years, it was found that consumers preferred smaller fingers and that none of the varieties could survive the handling and/or taste requirements of the market. The value of the whole research program is now called into question because it was not market oriented.

The regional market for agricultural commodities is characterized by transient and informal channels, inadequate communication, ill-defined grades and standards, a CARICOM Agricultural Marketing Protocol which does not function well, and serious competition from the United States.

This project assumes that the best way to develop a production/marketing system geared to exports is to move into nearby regional markets first, gain experience, and then move into the more difficult extra regional markets as experience permits and as opportunities present themselves. In the context of St. Vincent, a crucial element of developing the production/marketing system is to enhance the capability of the agricultural sector to adapt quickly to changing market condition and opportunities. A necessary condition for achieving this capability is basic reliable descriptive data on production and marketing potential.

Establishing this data by:

- 1) Conducting a national census of agriculture;
- 2) Indicating routine crop production forecast for selecting commodities; and
- 3) Creating the capacity of the MTA Statistical Unit to perform special surveys to support project planning and design activities.

Documentation and data pertaining to agricultural operations in St. Vincent are mostly limited to ad hoc efforts based on anecdotal testimony. Social systems and the lack of a tradition of record keeping also contribute to the difficulties involved in documentation and data acquisition. The prevailing land tenure systems, job multiplicity, and marketing systems do not lend themselves to categorization of many established census procedures. Because of the lack of a tradition of record keeping, even recently created institutions such as the Marketing Corporation keep incomplete information on their transactions. Many persons, from farmers to institutional managers, see little need for records and consequently attach little importance to data-gathering procedures.

In the absence of an organized data base, policies, plans, and programs may be based on impressions, hearsay, or commonly accepted notions that are not documented. Without basic data, the relative importance of plans cannot be determined; the available resources for project development cannot be estimated and the amount of materials or supplies needed for implementation is difficult to calculate. Currently little reliable information is available in St. Vincent on crop production (other than for banana and arrowroot), the agricultural labor force, market prices obtained by farmers, or fishing or forestry resources. As the fisheries officer states, "We cannot even estimate what the possibilities are". There is no complete list of farmers. The last agricultural census survey, done in 1972-73, remains the primary source for program planning. The inadequacy of basic, up-to-date data limits the ability to plan marketing arrangements, to optimise credit allocation, identify production weaknesses, etc. While the ad hoc collection of data by CARDI and other projects are useful, these efforts are not sufficient. Minimum data needs should be determined and a data collection system be established and maintained. Physical facilities limit access to data which is collected. Reports and past records are frequently stored in an unorganized fashion, piled in cabinets, on shelves, or on the floor wherever there might be space. Copies of reports and documents are usually limited. The few available to the public soon disappear.

1) Design Requirements

Efforts to improve agricultural data gathering and analysis in St. Vincent should be attentive to two strategic requirements. First, whatever is attempted must be relevant and reliable. Second, the activities must have the explicit support of decision makers. The point here is that care be taken to ensure priority data needs are taken care of first, reliability of data is not specified for quantity, and there exist in fact an effective demand for these data by key decision makers.

From the operational point of view, efforts to improve data must take into account the physical and staff resources available, the recurrent cost associated with sustaining proposed activities, and appropriate liaison with data users including Central Planning Unit personnel as well as elected officials of the Government.

2) Recommended Design

It is proposed that agricultural data collection and analysis remain the responsibility of the MTA Statistical Unit.

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This Unit should in the first instance establish and maintain fundamental descriptive data on the resources, production, and economics of the agricultural sector. Analysis of data would be limited to identifying and describing relationships among data vis-a-vis geographical districts, seasons, size of farm holding, and other basic attributes. Once a reliable basic description of the agricultural sector has been established, the Statistical Unit should have the capacity to perform special purpose surveys. A priority need here is forecasting of production for key crops. Reliable indications of likely supplies of crops at future dates will enhance the ability of farmers to plan harvest and negotiate sales, and it will enhance te deliveries. Fundamentally, reliable crop forecasting helps to reduce risk for farmers and traders alike. The capacity to perform crop forecasting surveys would also be available to collect special purpose data, as for example, to support project design exports by donors, accomplish loan appraisals by the CDB, or quickly document the effects of a natural disaster in the rural areas.

3) Outputs

a. Sampling Frame

An area sampling frame (as opposed to a list sample frame) will be constructed. It will be multi-purpose and include both rural and urban areas of the state. It will be suitable for the agricultural "census" and follow-on agricultural surveys, but it will also be suitable for other surveys as the CPU may determine, e.g. housing, health, and education. It will be based on the 1:2,500 scale maps produced by the British Directorate of Overseas surveys. Existing enumeration districts will be drawn on the 1:2,500 maps, using boundaries that can easily be identified in the field. Each of the 161 enumeration districts would have an average of about 125 household, which one enumerator could list in two or three days. Arrangements will be made so that in the next population census, an agricultural supplement will be administered to each household so that a combined list and area frame can be used for the 1990 decade census.

b. Agricultural Census

The previous two agricultural censuses were conducted under regional programs. The 1961 census was conducted with the assistance of the Statistical Office of the Federal Government of the West Indies. The 1972/73 census was conducted with the assistance of the Agricultural Statistics Unit of the British Development Division.

To the extent possible, the census funded under this project will be a repetition of the 1972/73 census, with the following exceptions: an area sampling frame will be combined with a list frame based on full enumeration of all household in each enumeration district; complete census of all farms above 25 acres rather than above 50 acres; and micro-computer tabulation of the data. For further details of the census design, refer to excerpts of the 1972/73 "Census of Agriculture ..." attached to this Annex.

c. Regular Monitoring and Forecasting of Production and Marketing Volumes

Based on the sampling frame developed, a regular survey of producers will be conducted to determine, areas and varieties planted of the four commodities, and expected timing quantity and quality of the harvest. This may require a separate survey for each commodity. The Statistical Unit will collaborate with the Marketing Corporation in monitoring and forecasting market volumes of the four commodities. A regular survey of traffickers will be conducted to determine volumes, quality, source and destination and market outlooks of the four commodities. This information will be combined with information obtained from larger traders including the SVMC to present an overall review and forecast the marketed volumes.

d. Special Surveys and Studies

Issues frequently arise which could be greatly clarified current data were available. The Statistical Unit will under this project be able on short notice to prepare a limited number of special studies related to the production and marketing of the four commodities or alternative commodities. The value of the Statistical Unit may well be judged by key decision makers on the timeliness and quality of this particular output.

4) Inputs

a. Technical Assistance

A Survey Statistician will be supported by the project for a period of 24 months. The Survey Statistician will be trained and experienced in designing and conducting surveys. This person's initial and continuing responsibility will be the technical management of the census, including development of the sample frame;

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the enumeration instruments; the enumerators manuals; the editing manuals; the adaptation of the micro-computer software to edit, tabulate, and produce tables; and prepare final report. The statistician will also be responsible for the design of the procedures for regular monitoring and forecasting of production and market volumes and for the design of procedures for special survey and studies based on survey. This long-term person will be supplemented by up to 12 months of short-term assistance for work requiring special skills. It is anticipated that about 4 weeks of a Mathematical Statistician will be required to design the sampling methods, 2 weeks of a forms designer, 12 weeks of data analysis, 12 weeks of a Computer Programmer, and about 20 weeks of training personnel for workshops in St. Vincent.

b. Local Personnel

The project will cover the cost of the services of a part-time Advisor to the census and a full-time Census Director. The Advisor will be a previous Director of the Agricultural Census and who will provide assistance in the design of the sample frame, the design of the instruments and the manuals, the recruitment, training and direction of the enumerators and supervisors, and the interpretation of the results. The Census Director will handle the day to day logistics of the census.

The project will cover the cost of employing the supervisors and the enumerators, as well as, coding personnel, and data entry assistants.

The GOSV will provide the services of the current personnel in the Statistical Unit, including the Statistical Officer, two Field Officers, and a Clerk, as well as the Economist.

c. Micro-Computers

Three micro-computers will be purchased under the project complete with replacement parts, power supply regulators, and the software required to handle the statistics associated with the census survey, follow-on surveys and present data management needs. One of the three micros will be transferred to the Central Processing Unit after the Census is completed and will enhance linkages between the two units.

d. Vehicle Rent/Purchase

The project will provide one vehicle to the Statistical Unit and will cover the cost of car rental during 6 weeks the census enumeration period.

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e. Expendible Supplies

Supplies required for the census, such as printing of questionnaires and manuals and reports, training material, will be funded by the project.

f. Office Expansion and Equipment

The project will fund the refurbishing of offices to be used by the APU, space dividers, desks tables, chairs, shelves, filing cabinets, chalk boards, telephones etc. deemed necessary for the efficient operation of the APU.

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INSTITUTIONAL ANALYSIS

A. Ministry of Trade and Agriculture

1. The Structure of the Government, the Ministry and Organizational Relationships

The Ministry of Trade and Agriculture (MTA) is one of eight Ministries and five entities of the GOSV, responsible for Government operations and administration. The Ministries include Finance, Planning and Development; Home Affairs, Housing, Local Government; Community Development and Electrical Division; Communication and Works; Health; Education and Youth Affairs; Legal Affairs; and Foreign Affairs and Tourism. The entities are Police; Governor General; Prime Minister's Office; Prisons; and Overseas Representation. The structure of Ministry responsibilities is subject to change over time with changes in Government and personalities within the Government. Functionally, the three Ministries most closely related to the MTA are Education and Youth Affairs, because agriculture is included in the curriculum, Finance, because it directs budgeting and planning, and Health because food and animal health are related to human health.

The MTA is organized into two departments: Agriculture, the larger of the two, and Lands and Surveys. Trade responsibilities are minimal and consist of price control surveillance, export and import licensing, and trade statistics recordkeeping. The Land and Surveys Department consists of eleven surveyors or survey technicians, six draftsmen and several assistants and is charged with maintaining updated land records.

The Agriculture Department (AD) consists of a number of small service/extension/regulation units (or divisions) plus the extension field staff. The Statistical Unit and the Economist report directly to the Permanent Secretary. The Extension Service incorporates the Propagation Unit, the Engineering Unit, the Crop Protection Unit, the Information Unit, and the Home Economics Unit. These units report through the Extension Officer to the Chief Agricultural Officer (CAO). The other units report directly to the CAO. These include the Research Unit; the Forestry Division; the Fisheries Division; the Animal Health Unit; the Livestock Production Unit, and the Camden Park Experimental Station.

The AD is represented on the Boards of several Statutory Bodies. The representation allows the communication of plans and programs but does not guarantee the pursuit of joint or mutually

beneficial projects. These bodies include the Development Corporation (DEVCO), the Marketing Corporation (SVMC), the Banana Growers' Association (BGA), the Arrowroot Association and the Agricultural Development Corporation (ADC).

Outside interests have a voice in the affairs of the AD through the National Agricultural Planning Committee (NAPC) which consists of the Parliamentary Secretary; the CAO; the Heads of Extension, Forestry, and Fisheries; two farmer representatives, and representatives from Women and Development (WAND), National Farmers' Union (NFU), WINBAN, CARDI, the Organization for Rural Development (ORD), DEVCO, SVMC, BGA, Arrowroot Association and ADC. Research and extension sub-committees have been formed. NAPC presently meets as issues arise.

The AD participates in and/or benefits from a number of regional and international programs: the Caribbean Regional Rural Development Advisory and Training Service Project (CARDATS), CARDI, CDB, Peace Corps, Caribbean Agricultural Extension Project (CAEP) through UWI-St. Augustine, WAND, UWI Extra-Mural Department, FAO, Farmer Training Institutes, the Eastern Caribbean Institute for Agriculture and Forestry and the Jamaica and Guyana Agricultural Schools.

CARDI inputs into the Project will provide the improved adaptive research that is a key factor to increasing agricultural productivity. CARDI is responsible for conducting agricultural research on a regional basis to such solutions to agricultural problems that are common among the Eastern Caribbean states. This regional approach gives individual islands access to specialized research skills that cannot be sustained or financed on a full-time basis by each country. St. Vincent will benefit from CARDI's strategy as will the proposed Project by providing specialized researchers to assist the MTA to conduct varietal selection trials and the required production inputs. CARDI will take an active role in working with the MTA's research officer to determine the best performing varieties under St. Vincent conditions. By identifying and adapting improved production technology to Vincentian conditions and farmers, the fundamental task of stimulating agricultural sector growth will be addressed.

The AD works in cooperation, with or parallel to local non-Governmental organizations including ORD, NFU and perhaps five to ten small farmer groups.

Bilateral donor programs have been limited. The principal donor has been the British Development Division (BDD) which has sponsored a number of small and medium sized projects: pineapple, black pepper, livestock, mango, agricultural stations, arrowroot expansion and diversification, and the agricultural census, inter alia.

2. Resources

The 1983/84 estimate of GOSV recurrent expenditures is EC\$86,060,065, with MTA recovering EC\$4,276,682 or 5 percent of the total. The projected GOSV 1983/84 capital expenditure is EC\$57,189,220, with MTA claiming EC\$8,976,730 or 16 percent of this total.

While GOSV recurrent expenditure estimates increased 44 percent since 1980/81, MTA estimates increased 49 percent. Over that same period GOSV capital expenditure estimates decreased 4 percent and MTA estimates have decreased 20 percent.

The 1983/84 recurrent expenditures of the MTA are handled by three accounts: Administration - EC\$506,093, Agriculture - EC\$3,269,396, and Lands and Surveys - EC\$501,193.

Figure 1, shows the organizational and personnel structure of the MTA. The technical staff generally conforms to three levels of experience. In order of increasing experience these are Agricultural Instructors (AI), Agricultural Assistants (AA) and Agricultural Officers (AO). Diploma training for the agricultural staff is supported by the Ministry which will send an AI for training after a two year probationary period. By definition the AA must have diploma training. All have diplomas in either general agriculture or animal health. A B.Sc. degree is recommended as part of the qualifications for an AO position.

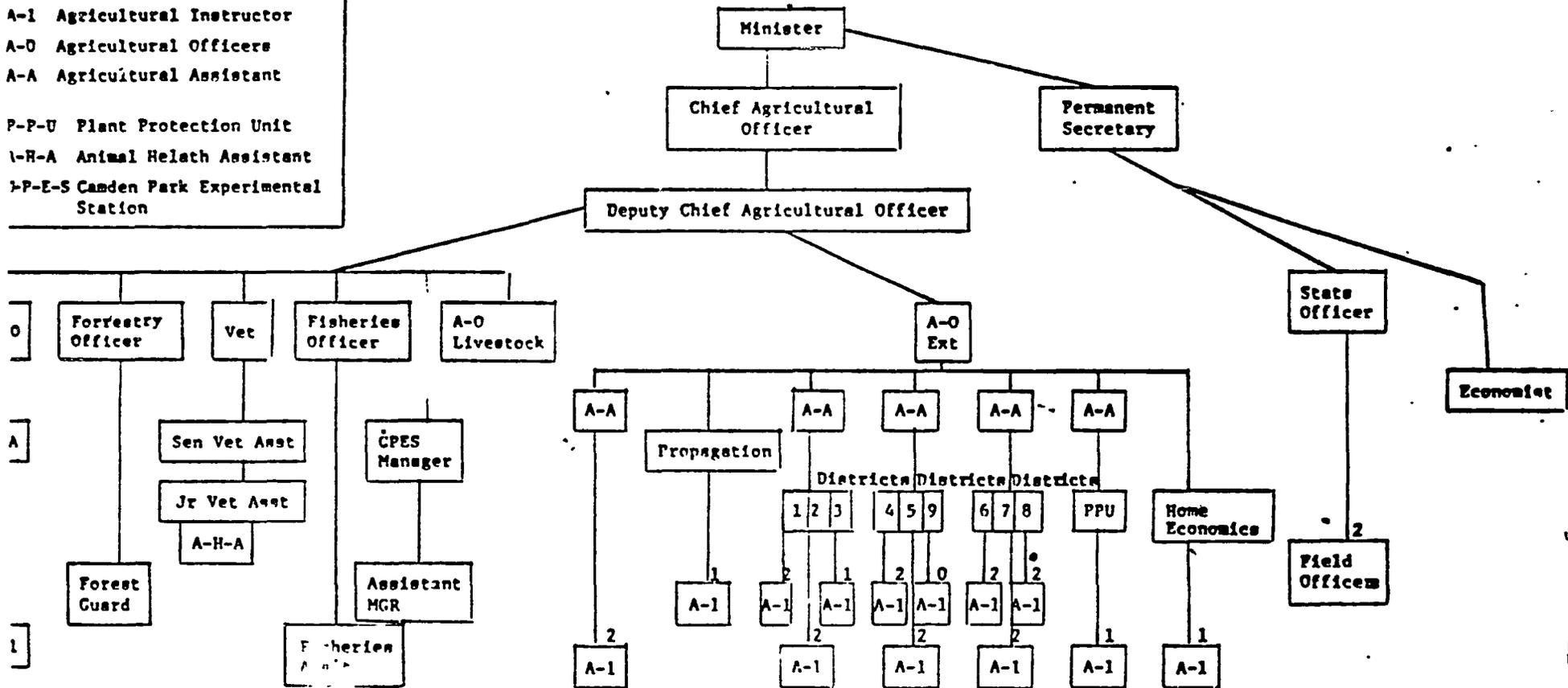
The MTA lacks the financial and human resource base to carry out an effective varietal selection trial program. The organization and management of the Ministry requires that assistance be provided to sustain the activities proposed under the Project.

Due consideration should be given to the complexity and resources required to coordinate and implement the four major components proposed under the Project. The MTA, lacking sufficient financial support, appropriate organization and management systems including personnel, administrative and office procedures and project implementation, monitoring and evaluation capabilities, will require assistance to undertake the Project.

Technical assistance in the form of long-term advisors as well as selected short-term personnel are proposed to provide the needed human resources to manage and implement the Project. This will assist the MTA to improve its overall operations through counterpart training, as well as provide the necessary skills to implement the Project. With the assistance of CARDI, AID financed technical assistance under the Project will allow the MTA to carry out Project activities and increase institutional capacities.

ORGANIZATIONAL STAFF CHART - Agriculture Department

KEY
 A-1 Agricultural Instructor
 A-O Agricultural Officers
 A-A Agricultural Assistant
 P-P-U Plant Protection Unit
 A-H-A Animal Health Assistant
 P-E-S Camden Park Experimental Station



As a whole, the physical facilities of the MTA do not provide minimal or adequate space for technical employees to effectively complete their work. The Ministry building is congested with as many as 3 to 4 desks occupying an office space of 100 square feet. The various units within the MTA have inadequate operating and storage space. A study prepared by the Central Planning Unit (C.P.U.) in 1981 for Government wide office space, indicated that the MTA facilities provided net office space of 41 square feet per public servant. Usual office accommodation of 75 square feet per person are considered to be their minimum standard. In particular, the Crop Protection, Fisheries, Home Economics, Information, and Veterinary Units need improved physical facilities which would provide basic requirements.

Financing by USAID of technical assistance is planned for the project. There is literally no office space which could be utilized by the advisors in the MTA Facilities, other than the conference room. Even there facilities lack sufficient seating for agricultural staff who use it regularly for meetings and conferences. The space constraint is recognized as being critical to effective overall operations of MTA activities. The addition of technical advisors to the existing overcrowding at the MTA will aggravate the situation to a point where the effective utilization of such assistance is seriously questioned. A case in point is the UNDP Planning advisor who has arrived in St. Vincent. She currently has not been formally assigned to the MTA due to a lack of space for her.

Financing of USAID technical assistance must be considered in light of the space constraint. The effectiveness of an advisor can partially be measured by the degree of direct communications and contact they have with counterpart staff. The more direct and continuous the contact over a given period of time, the greater degree of influence and training an advisor can provide. Any technical assistance provided under the project should allow for the provision of space within the MTA or in close proximity to the Ministry's facilities.

Each of the nine agricultural districts in St. Vincent ideally have a district office to be used by extension workers as a contact point with farmers, for storage of supplies and equipment, for work on records, and for more formal farmer/extension meetings and seminars. However, three of the nine districts have no district offices and one district has the structures for an agricultural station, but it has never been completed.

Field extension workers are expected to live in the districts in which they work, but housing is frequently difficult to find at a reasonable price. Six of the nine districts provide some form of housing, but two of the houses are in need of repair before they are inhabitable.

Equipment, including transportation and communication means, is a part of any operational unit. Several of the MTA units have no equipment other than office desks. For the most part, MTA staff must rely on their private vehicles or on public transportation for their field work. Because much of the interior and northern part of the island is accessible only by four-wheel drive vehicles or by foot, the work done by the MTA staff is limited both geographically and by time.

The CAEP is addressing equipment needs and to a limited extent, facility needs for field extension workers, but other units within the Ministry remain poorly housed and supplied.

B. Growers' Organization

The Project will provide assistance to the Organization for Rural Development (ORD) modest expansion of in-kind credit activities already being carried out by this group. Small farmers in St. Vincent have been associated with agriculture associations/organizations for a considerable number of years and their acceptance by the target group should prove no major problems for utilizing ORD to channel Project assistance and conducting implementation activities. Two such groups which provide this historical perspective but will not be direct benefits of Project funds are the St. Vincent Banana Growers' Association (BGA) and the St. Vincent Arrowroot Association. A farmer oriented rather than commodity specific organization that will potentially benefit from the Project is the Organization for Rural Development (ORD). A second group, the Georgetown Area Farmers Group (GAF), have also been identified and may be considered for inclusion in the Project at a later date. It has been determined this organization currently does not have the institutional capacity to carry out an in-kind credit program as proposed under the Project. They lack any historical experience in administering and managing in-kind credit programs, as well as lacking personnel who can monitor and keep records to assume pay back on loans. If during the life of Project GAF and NFU or other farmers' associations become capable of administering in-kind credit programs, due consideration will be given for inclusion into the Project. A description and discussion of possible impact of each group is presented below.

1. St. Vincent Banana Growers' Association

The BGA is a statutory body incorporated by the St. Vincent Parliament in 1951, with the purpose of assisting and managing the production and marketing of bananas. The day-to-day activities of the association are the responsibility of the General Manager, who

directs a professional and clerical staff, providing a range of services to BGA members including extension, input supply, credit, pest and disease control, packaging and transportation of bananas to shipside.

The Association has 9,139 registered growers of which 2,154 sold bananas in the year ended on December 31, 1982. Total acreage in banana production amounted to 6,000 acres. This crop represents more than one half of the total value of exports from St. Vincent and is the single most important agricultural commodity produced.

The governing body of the BGA is a Board of Directors having elected producer representatives, and appointed members by Government from the Ministries of Finance and Agriculture. The BGA interacts with other producer groups and Government agencies in the coordination of development activities in the agricultural sector. The association contributed to the design of the National Agricultural Extension Plan and is presently involved with the Ministry of Agriculture and Trade in a dialogue concerning implementation of MTA's Agricultural Program for 1984.

The annual budget for the BGA in 1982 amounted to EC\$655,260.00. This budget supported a staff of 17 people, a majority of which have primary responsibility for conducting extension education activities targeted toward increasing yield per acre and quality of production, and provided production credit to registered members.

a. Extension Activities

The association provided extension training to banana producers by means of field visits and group discussions. Topics covered included proper methods for fertilizer placement; sleeving and deflowering; nematode, leaf spot and borer control; and recordkeeping. The field agents were also involved in a leaf spot monitoring program. The Windward Islands Banana Growers' Association (WINBAN) provided backstop support in disease identification and control. WINBAN was also involved in leaf and soil analysis with subsequent results reported to the participating growers.

b. Production Credit

Annual production credit amounts to over EC\$3 million per year with approximately 70% of the credit in the form of withholdings from individual banana grower sales followed by subsequent liquidation of the amount withheld by providing the

grower with production inputs. The credit system is a revolving fund with loans made on the basis of funds available due to projected monthly repayments of outstanding accounts.

2. St. Vincent Arrowroot Association

Arrowroot is the second most important agricultural product in St. Vincent. Membership in the Arrowroot Association varies from year to year with about 300 registered members.

The Arrowroot Association has been in existence since the 1930's and assists its members with improving production, securing credit, extension activities and marketing of the starch. A Board of Directors elected from the membership and appointed representatives from the Government provide general policy direction. A General Manager is responsible for daily operations and supervises a professional and clerical staff which provides services to the membership.

The Arrowroot Association, together with the BGA, represent 70 to 75 percent of all known agricultural producers in St. Vincent. This involvement of producers within the institutional framework of a formal organization such as the BGA and the Arrowroot Association, provides the majority of the project beneficiaries with the experience and knowledge in dealing with credit in-kind activities that will be implemented under the project. The Arrowroot Association members will also be potential participants in the commodity production program, since the majority of farmers in St. Vincent multi-crop their fields.

3. Organization for Rural Development

The Organization for Rural Development (ORD) is a voluntary, non-profit private statutory body incorporated in the St. Vincent House of Assembly in 1978, with the goal of assisting rural Vincentians to improve their quality of life. The organization has obtained funding from several foundations, including the Inter-American Foundation and the Rockefeller Brothers Fund, which has enabled it to introduce improved varieties of local crops, establish village level tool banks, develop a small farm credit scheme, create a revolving bank fund, and provide a number of nutrition, family life, and agricultural related seminars. The organization is committed to an integrated practical approach to development in which rural peoples are active participants in all phases of the development programs.

Budget figures for the year ending January 31, 1983, show an income of EC\$319,152.00 with expenses of EC\$311,153.00.

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Expenditures were made on staff salaries, allowances for voluntary field workers and rural leaders, training, credit for a revolving fund of agricultural supplies, and seed propagation and experimental plot expenses. Income to ORD was primarily through support by the Inter-American Foundation in the form of a EC\$242,395.00 Grant and through smaller contributions by the Canadian International Development Agency and the Rockefeller Brothers Fund. Receipts from agricultural supplies sales resulted in revenues of EC\$18,867.00.

There are 8 full-time staff members with 25 volunteer workers involved in field activities. ORD development projects are active in 26 villages involving 900 farmers. Professional and technical people, including CARDI personnel, MTA officials and local business leaders, provide voluntary technical assistance on an as needed basis. These personnel resources provide the means for executing ORD activities, which have included: (a) assistance to 164 farmers in the production of 64 acres of peanuts, resulting in yields of 1,500 to 2,000 pounds per acre; (b) conducting village education programs consisting of 28 training sessions on recordkeeping, peanut production, vegetable production and nutrition in 15 villages, benefiting approximately 700 people; (c) assisting farmers with in-kind loans for the production of vegetable crops, legumes and corn; and (d) establishing Futures contracts for farmers' production of yams and ginger.

The loan program represents a substantial portion of ORD's expenditures in recent years. For example, in 1982, over EC\$130,000.00 was spent to fund various items in the revolving fund. Items included in the fund are vegetable seed, chemicals, fertilizer, lime, gypsum and rat poison. Fifty pounds of vegetable seed, consisting of tomatoes, carrots, cabbage and cucumber, were sold to 150 farmers covering an estimated 54 acres of production. Over 72,800 pounds of fertilizer was sold to 600 farmers. Production inputs were distributed from eight supply centers in operation at Fancy, Choppins, Riland Hill, Peniston, Barrouallie, Rose Hall and Troumaca. An example of the Loan Agreement used in the credit system is attached in Appendix 1. ORD appears to have gained from experience over the last three years and is increasing the percentage of repayment of loans from an initial low of 24 percent in 1981 to 79 percent during the last production season, 1983. This repayment percentage can rise further if ORD is successful in implementing Futures contracting and sale of farmers' production with a deduction of outstanding loans at the time of the sale. An example of the Futures contract is attached in Appendix 2. Over 100 farmers are already involved with ORD in forward contracting of yams and ginger. The organization is also under consideration for a USAID SDA Grant to purchase plastic boxes to be used for improved packaging to transport fresh produce to market.

A recent audit, 1982, of the organization by the accounting firm, Coopers and Lybrand, Ltd., indicates that ORD's financial monitoring system is adequate. The audit outlined areas of weakness

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Saint Vincent and the Grenadines
DATED THIS DAY OF

1983

THE ORGANISATION FOR RURAL DEVELOPMENT

AND

EASTERN CARIBBEAN AGENCIES LIMITED

AGREEMENT.

PREPARED BY

BERNARD H. V. JONES

BARRISTER-AT-LAW

THIS AGREEMENT is made the _____ day of _____ in the year.....

of Our Lord One Thousand Nine Hundred and Eighty-three BETWEEN

THE ORGANISATION FOR RURAL DEVELOPMENT of Saint Vincent and the Grenadines.....

(hereinafter referred to as "The Vendor") of the One Part and EASTERN CARIBBEAN AGENCIES LIMITED of St. Vincent and the Grenadines(hereinafter referred to as "The Purchaser") of the Other Part.

The Vendor and the Purchaser have agreed that the Vendor will sell and the..... Purchaser will buy a quantity of yams and ginger at the times and under the conditions hereunder stated:-

1. The produce must be clean without bruises and must be in good marketable..... condition fit for export.
2. No yam must weigh less than two(2) pounds.
3. The total quantity of yams to be offered and accepted is to be not more than 500,000 pounds.
4. The purchaser will supply yam plants as needed before 11/1st, 1983.
5. The sale and purchase of the yams will take place between 15 January,1984..... and 31, May 1984.
6. The Vendor will transport at its own costs the produce(both yams and ginger)..... to the Purchaser's place of business in Kingstown, or such other place as may be agreed on by both parties.
7. The produce (yams and ginger) must not be packed in bags at the time of delivery to the Purchaser.
8. The Purchaser shall give the Vendor at least five(5) clear days notice of the amount of yams and/or ginger required for each week.
9. The Purchase price of the yams will be fifty cents(50 cents) per pound.
10. The total quantity of ginger to be offered and accepted for sale and purchase is to be not more than 200,000 pounds.
11. The Purchaser will supply ginger plants as needed before May 31, 1983.

cont'd 2.....

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12. The sale and purchase of ginger will take place during the 1st February, 1984.....
to 31st May, 1984.

13. The purchase price of the ginger will be 50 cents per pound for ginger.....
classified by the purchaser as Grade 1 and 30 cents per pound for ginger
classified as Grade 2 by the Purchaser in accordance with criteria accepted by the
parties herein. In the event of dispute over this or Clause 1 or 2 the matter will
be referred to a recognized marketing authority agreeable to both parties whose
ruling would be binding on both parties.

In case of any wilful default or negligence in the terms of this contract.....
the offending party shall pay to the aggrieved party compensation in damages for loss
incurred to be settled by a senior official from a competent firm agreeable to both
parties and this failing by the Courts of Saint Vincent and the Grenadines

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and affixed their
seals the day and year herein first written.

SIGNED SEALED AND DELIVERED BY
EASTERN CARIBBEAN AGENCIES
LIMITED in the Presence of,

[Signature]

SIGNED SEALED AND DELIVERED BY
THE ORGANISATION FOR RURAL
DEVELOPMENT in the Presence
of,

[Signature]

[Signature]

[Signature]
J. H. G. T. G. 2

ORGANISATION FOR RURAL DEVELOPMENT

LOAN AGREEMENT

A LOAN AGREEMENT made this _____ DAY OF _____ 198 BETWEEN the ORGANISATION FOR RURAL DEVELOPMENT(ORD) having its Registered Office at Kingstown hereinafter called "the Creditor") of the One Part and _____ of _____ hereinafter called "Debtor" of the Other Part.

1. WHEREBY IT IS AGREED as follows:-

The total Loan Agreement received by the Debtor as shown in Appendix 1. The total Loan to be repaid by the debtor is the Principal as shown in Appendix 1, plus one(1) percent interest per month on the unpaid balance.

2. a.

The debtor on or prior to the execution of this agreement shall pay to the Creditor the sum of \$1.00 for each One Hundred Dollars(\$100.00), or portion thereof, credit extended as partial compensation for administrative, storage, distribution and instruction costs. Payments of the debt plus accrued interest shall become due immediately upon the sale of the last crop, which is expected to occur during the month of _____ 198 _____. In case of hardship regular payments may be arranged with the approval of ORD's Chief Financial Officer.

b.

All sums payable to the Creditor under this agreement shall be paid to it at its office at Kingstown or at such other address as the Creditor may from time to time specify. Payments made by post shall be at the risk of the debtor.

3. No relaxation forbearance or indulgence by the "Creditor" in enforcing any of the terms and conditions of this agreement or granting of time by the Creditor to the Debtor shall prejudice or restrict the rights and powers of the Creditor hereunder nor shall any waiver of any breach interpreted as a waiver of any subsequent or continuing breach hereon.

4. This agreement shall not come into force until signed on behalf of the Creditor and until the requisite fee has been paid by the buyer.

5. The signing of this agreement by the debtor gives the ORGANISATION FOR RURAL DEVELOPMENT(ORD) having its registered office at Kingstown, the right to insist and take action to ensure that the debtors salary, crops, gratuity, pension or other monies which may become due from any source during the time the Loan Agreement is enforced, be deposited with the ORGANISATION FOR RURAL DEVELOPMENT or its bankers whichever is convenient, to ensure proper debt settlements are made.

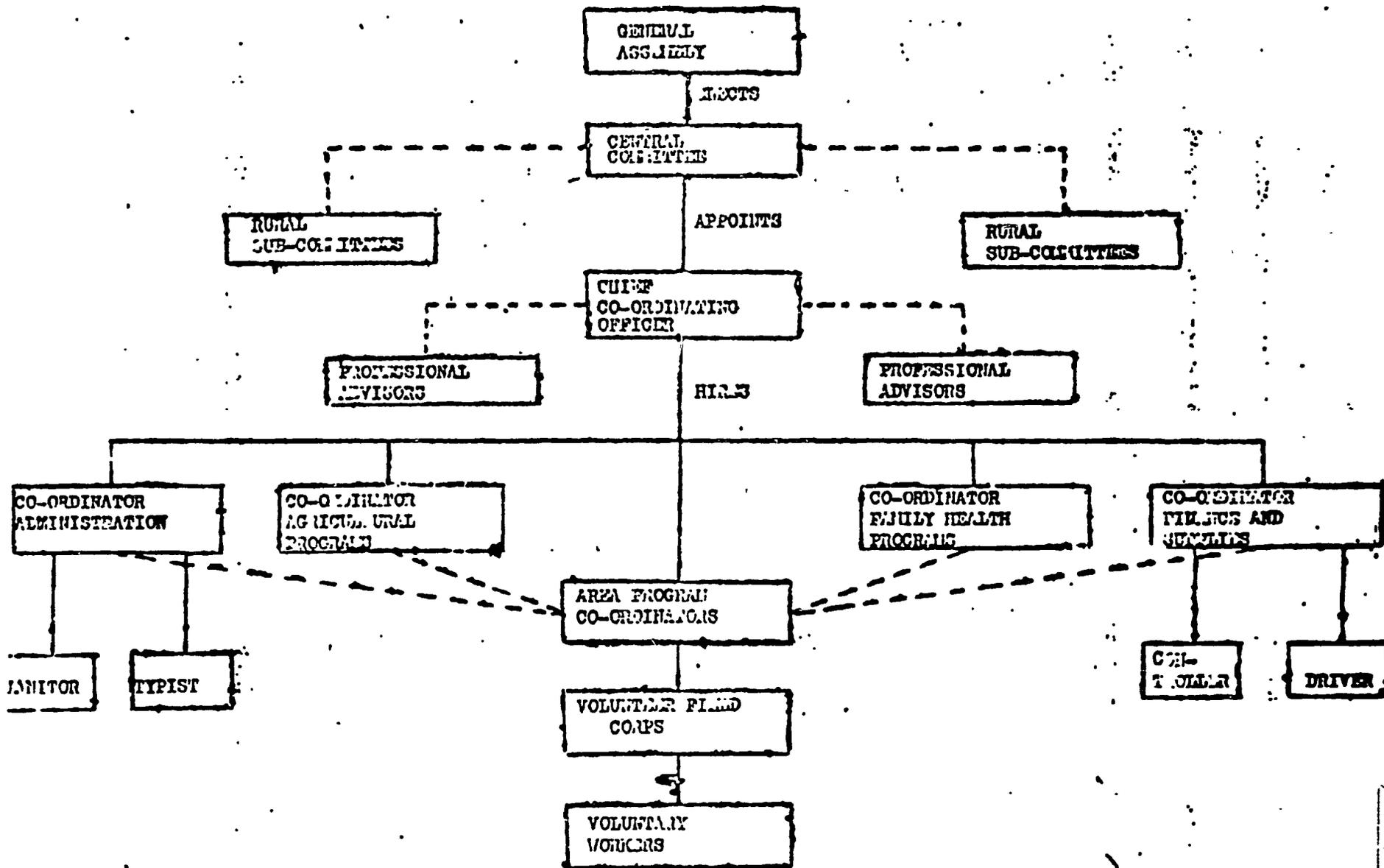
AS WITNESS WHEREOF the parties hereto have set their hands and affixed their seals the day and year indicated above.

SIGNED BY: _____)
For and on behalf of the)
ORGANISATION FOR RURAL DEVELOPMENT(ORD))
In the presence of:-)

Signature of Debtor;

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ORGANISATION FOR RURAL DEVELOPMENT - ORGANISATIONAL CHART



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in ORD's accounting system, such as general improvement in the accounting system and format of its account books. Specifically, the firm recommended improvement of the monitoring of credit sales, more secure procedures for authorization of checks for expenditures and a permanent record of cash receipts in place of the present use of loose leaf worksheets. The audit concluded that ORD was in compliance of the terms of its Grant Agreement with the Inter-American Foundation, which required adequate accounting of all Grant funds spent.

ORD is in a position to become actively involved in the project. Their in-kind revolving loan system is a good example of the type that should be included in proposals by farmers' organizations to the MTA for grants of agricultural production inputs under the project. The organization is presently operating a system which while not yet self-financing has the potential of becoming so. It is expected that ORD will be a major factor in the distribution of production inputs to farmers under the project.

4. Georgetown Area Farmer Group

A second organization which in the past has been active in the Georgetown vicinity, has been the Georgetown Area Farmer Group (GAF).

GAF has a membership of about 53 farmers which represents the active agricultural producers in the Georgetown area. The organization was formed in June of 1979. The objectives of GAF are to develop and implement a program of agricultural activities. These projects concentrate on assisting members to: (a) improving the quality and quantity of producers' crops; (b) improving the nutrition of farmers and consumers; (c) making recommendations to Government concerning agricultural policy; (d) developing programs for in-kind credit, tool rental and other agricultural inputs needed to improve production; and (e) developing and improving the marketing of members' crops.

GAF has sponsored seminars conducted by ORD staff members which covered improved agricultural production practices, recordkeeping and budgeting of resources, scheduling of planting and weed cycles and other various production practices, as well as improving soil and water conservation on members' farms.

The organization has held discussions with the Ministry of Agriculture, the Chief Agriculture Officer and the Manager of the Marketing Corporation, to improve the marketing of members' commodities. The outcome of these discussions has been closer cooperation between the traffickers and GAF membership in improving the packaging of various commodities for export. Through the

standardization and improvement of packaging, the organization's members were exporting produce to Barbados worth \$1 - 2,000 a week. These activities have ceased due to the Barbados exporter's non-payment for delivered produce.

GAF has also organized the purchase of fertilizer, seeds and other agricultural inputs in bulk for sale through their outlet in Georgetown. This allows members to purchase in their immediate vicinity, eliminating the need to travel to Kingstown. GAF has not had experience in administering an in-kind credit program. GAF lacks the basic organization for administering an in-kind credit program. They require assistance, beyond the parameter of this Project, which would develop the appropriate administrative and management expertise to be responsible for Project inputs.

C. St. Vincent Marketing Corporation (SVMC)

1. Organization

The St. Vincent Marketing Corporation (SVMC) was established in June of 1975 by Parliamentary Act No. 26 (Attached Appendix F-1). The corporation functions under the policy guidance of a Board of Directors. The Board which consists of nine members is appointed by the Cabinet. Members of the House of Assembly are excluded from being appointed. The Chief Agricultural Officer is an ex-officio member. The Chairman and the Deputy of the Board are also appointed by Cabinet.

The Corporation being a Government statutory institution takes general policy direction from Cabinet. Although the Act provides for Government funding, the SVMC has been paying operating expenses from revenues generated through its activities.

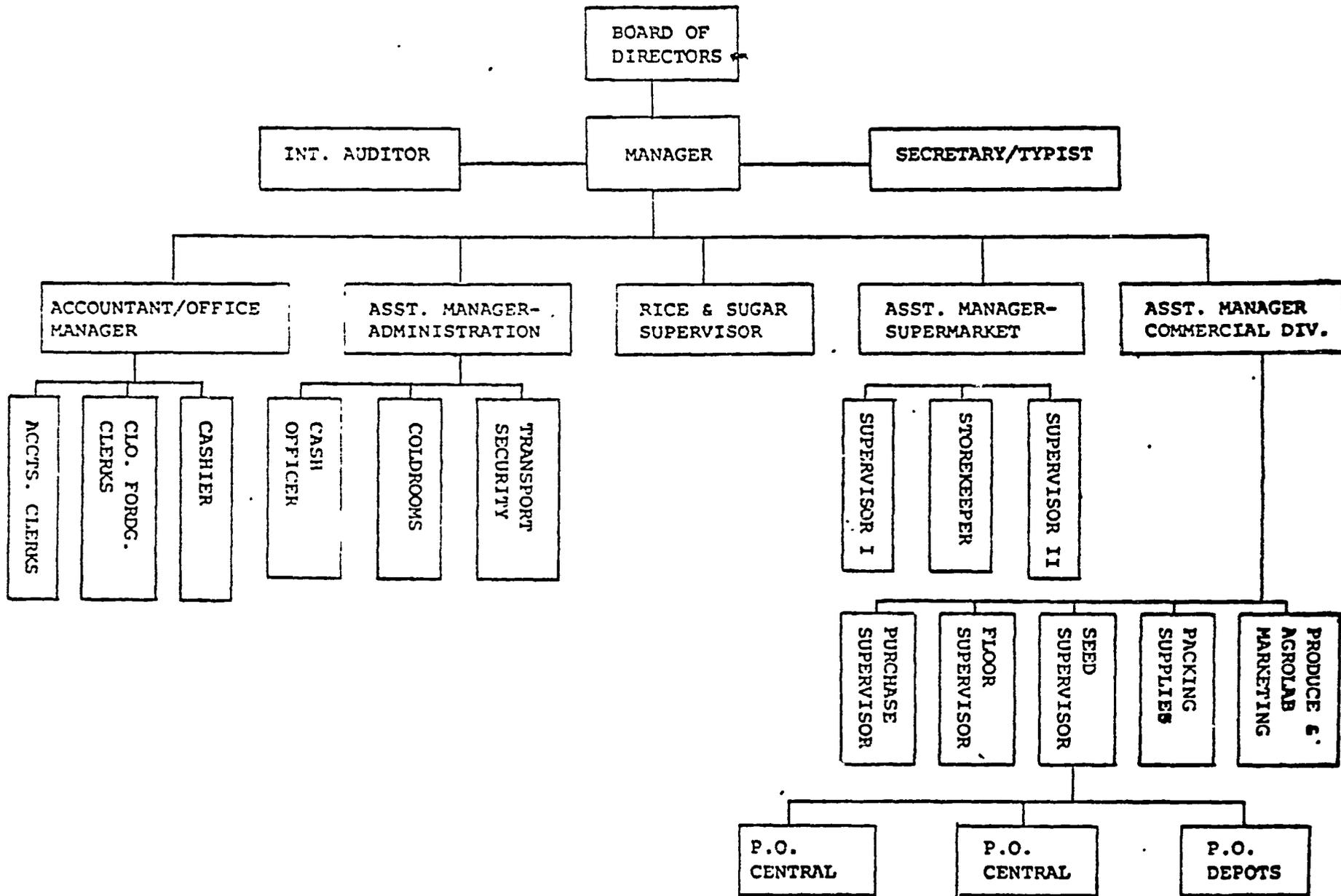
The SVMC is organized to effect the marketing of imported commodities; stimulate, facilitate and improve the production, marketing and processing of Vincentian produce; secure favorable arrangements for purchasing, handling, transportation and exporting fresh produce; provide storage; and promote St. Vincent commodities.

The SVMC has approximately 60 permanent employees. During peak seasonal trading of commodities, as many as an additional 60 to 80 temporary employees may be hired to handle increased volumes. Employees of the SVMC are paid from revenues of the Corporation and are not considered Civil Servants. The day-to-day operations are carried out by a Manager (Figure 2) who is directly responsible to the Board. The Board currently consists of nine members with representation from Government, private business and farmers/producers.

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FIGURE 2

ST. VINCENT MARKETING CORPORATION



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The current Manager, who was appointed on January 1, 1984, sees the Corporation as taking general policy direction from Government but operating on a free market basis. Major problems which he has identified include developing and expanding the SVMC markets, grade and quality control, post-harvest loss control, and market price information.

2. Operations

The SVMC operates three collection depots throughout St. Vincent. One is in the carrot producing Region, the second where the majority of sweet potatoes are grown and a third for general produce. Buyers of the Corporation, on a weekly basis visit these depots and purchase commodities on a spot market basis. On occasions, the Corporation may advertise on the radio for special order commodities or when a large order has been placed which cannot be met with supplies on-hand or available through the depots. The Corporation sells produce through a retail supermarket, with mark-up established by the Board.

The SVMC is the major purchaser of sweet potatoes, mangoes, ginger, tannia, eddoes, and pumpkins in St. Vincent. Recorded purchased volumes for the latest available years are shown in Table 1 below.

TABLE 1
Volume and Value of Purchases - SVMC

	1979		1980	
	EC(000)	MT	EC(000)	MT
Sweet Potatoes	387	675.0	577	1137.8
Carrots	149	270.5	150	212.7
Peanuts	15	7.4	71	33.8
White Yam	15	16.7	12	10.5
Coconuts	385	698.0	228	413.8
Pumpkins	25	47.2	26	48.4
Tannias	82	82.4	67	67.6
Portugese Yam	11	11.3	8	7.5
Christophenes	1	2.7	6	1.4
Ginger	412	374.1	270	222.7
Eddoes	108	139.9	97	97.7
Mangoes	121	72.6	82	95.4
Other Fruit/Veg.	123	N/A	110	N/A

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Approximately 90 to 95 percent of the fresh produce handled by the SVMC is exported. Traffickers deal with peanuts, plantains, oranges, carrots and sweet potatoes. The export of AMP produce of which (carrots, sweet potatoes, and peanuts are a part) requires that private traders obtain an export license from the Corporation.

For the year beginning July '81 and ending June '82, the value and volume of Traffickers' exports are shown in Table 2.

TABLE 2

Value and Volume of Traffickers' Exports From St. Vincent
(July '81 - June '82)

	<u>Value (EC)</u>	<u>M.T.</u>
Root Crops	10,085,555	7,137
Plantains	2,282,513	2,055
Other Fruit/Veg.	<u>764,623</u>	<u>708</u>
TOTAL	13,132,691	9,900

3. Assessment

The latest financial statement (Appendix 1) which is available for the year, ending December 1978 indicates the SVMC made a net profit of EC\$377,214.

The SVMC is involved in providing services which are usually carried out by private organizations. The purchasing and retailing of fresh fruits and vegetables is a major function of the organization in St. Vincent. The Corporation usually buys an amount equal to its expected export and retail sales. However, it has acted as a buyer of last resort when there have been major market gluts, particularly of root crops.

The profitability of the Corporation over the years can be attributed to a large part to its authority to set price controls for selected imports such as sugar and rice.

The Corporation has the potential to be a leader in assisting the private sector market and export St. Vincent's produce. For example the SVMC can provide packaging and storage facilities to improve and maintain the quality of produce and decrease post-harvest loss. The corporation can provide packaging services and sell materials, set quality standard guidelines to

improve export market acceptance which will develop market reliability and consistent quality for St. Vincent produce. The corporation is in the process of publishing market price information to producers and traffickers, which will provide a much needed service. The SVMC by utilizing its extensive existing facilities with the above services, can assist in reducing risk to farmers and traffickers in the production and marketing of Vincentian produce.

The Corporation when acting as a buyer of last resort has not been able to market high quality produce which results in lower expectations when buyer must purchase sight unseen. As a result, the SVMC may not be able to sell these commodities at any price, and takes on added storage costs or must move the commodities at a loss.

4. SVMC Participation in the Project

The marketing activities to be financed under the project will provide resources to the Government of St. Vincent to resolve one of its most pressing constraints. The assurance of reasonable markets has been identified by the Government and RDO/C as requiring sustained investment. The marketing problem is composed of two major interrelated elements. The first elements involve price formulation and the flow of that information to the active participants. Prices serve as a guide to farmers, particularly at planting time, as to the expected returns they can expect for their efforts. At harvest time, the farmer based on expected price, decides when to harvest. The process of transmitting price information essentially matches production and consumption for a given season and crop. Poor information or the lack of it creates risk which a Vincentian farmer may not be willing to take.

The second major element in the St. Vincent marketing problem is the actual physical movement of produce from the farm gate to the consumer. This includes a completed, interrelated set of activities which must be accomplished, including transportation, selection/grading, packaging and storage.

The marketing of export and domestic food crops in St. Vincent is an unorganized system which is handled by traffickers/hucksters and the SVMC. The traffickers/hucksters handle a major share (estimated at between 70 to 80 percent) of agriculture commodities in St. Vincent. These private individuals are often in competition with the SVMC since they usually offer higher prices at the farm gate than does the marketing corporation at the depot. The result is the SVMC has difficulty in fulfilling commitment for exports. The complexity of providing a base for effective marketing of St. Vincent produce is a difficult task. To initiate the process requires assistance to a nationally recognized

marketing institution, the St. Vincent Marketing Corporation. Project financed activities as proposed below will begin to provide the rationalization of the marketing process in St. Vincent.

It is proposed that the Project finance facilities to provide a covered packing shed which will be operated by the SVMC. This will provide for a high quality product to be shipped from St. Vincent and decrease the post-harvest loss while in transit.

The other services intended to increase trading volumes for traders while increasing the demand for St. Vincent produce in the regional market are also proposed. The project will finance the cost of assistance to provide improved packaging, and technical assistance to increase quality and promote forward supply contracts and improve and expand the existing information and pricing system to farmers and traders.

The SVMC has sufficient permanent staff and facilities to carry out these activities. The new Manager is willing to provide office space to the technical advisor. It will be necessary to provide furniture consisting of one desk, chair and file cabinet to make the office functional.

The SVMC has sufficient space within its facilities to store the package materials that will be financed under the project. The warehouse at any time will have several hundred square feet of space which can be used for the package materials.

The SVMC, under the new Manager, has recognized the need to provide better services to the farmer and trader. The Corporation has moved ahead and developed the terms of reference for a marketing expert to assist with promoting the export of fresh produce regionally and extra-regionally.

The Government and the SVMC have recognized that marketing is a synchomatic constraint to agricultural sector growth. Project activities proposed for financing will assist the SVMC to take the initial steps to incorporate major innovations and a coordinated effort to alleviate or remove the important constraints in marketing which are inhibiting sector growth. The SVMC giving high priority to efficient handling and storage, forward contract growing and price information is initiating the establishment and operation of an efficient marketing system, that will focus on private sector responsibilities and emphasize its function in the process. Marketing organized along a business enterprise model will provide for greater profitability to the farmer and trader. This will create the internal financing and provide incentives for sustaining the growth needed in the agriculture sector.

FINANCIAL AND ECONOMIC ANALYSES

The financial and economic analysis are presented principally in qualitative terms principally for two reasons: 1) although the direction (increase or decrease) of most of the changes described can be anticipated, estimates of the magnitudes of the changes are very difficult to make, and 2) using estimates for the largest anticipated changes (increased yields and acreages) the benefits so outweigh the costs that refinements are unnecessary. The calculations are presented with the economic analysis.

1. Financial Analysis

A financial analysis describes the costs and benefits accruing to the individual parties participating or directly affected by the project. It is impossible to quantify all aspects, but this analysis will describe the nature the impacts and supply numbers where available. The main parties affected are the producers, the traders, the consumers, the MTA, and farmer organizations.

The producers stand to benefit in several ways resulting in increased returns to management, land, and labor and in decreased risk with respect to those returns. Refer to Tables VII-H. Increased use of purchased inputs will increase yields and quality during the first two years of the Project. (The increased yields shown in Tables VII-H-1&2 are due exclusively to input use). New varieties, introduced in the second and third years, will decrease losses from nematodes, perhaps increase yields in non-infested fields, improve the quality of the harvested produce, and improve the ability to store the produce in the case of sweet potatoes and yams. (The increased yields shown in Table VII-H-2 are due to varietal improvement). The new varieties may or may not increase the level of inputs required. Although the commodities are aimed at export markets, with the exception of onions, it is anticipated that the increase in overall production of a commodity will increase the level of non-exportable quality produce which will increase the supply on the local market, perhaps depressing local prices. Prices for onions should not fall until local production replaces imports. The export prices will be tied to quality of the produce delivered and to suppressed personal income in Guyana and Trinidad, two principal outlets. The producer, by being able to store sweet potatoes and onions will be able to wait out seasonal fluctuations in price and obtain high returns. Similarly, by regularly reading the

market information reports which will be published by the SVMC, producers will be able to anticipate price fluctuations and arrange their planting schedule to harvest when prices are relatively higher. Rational decisions about irrigation and storage can be made on the basis of historical data. Finally, by providing an opportunity to engage in a profitable alternative to banana and arrowroot production, the project will foster diversification by the producer, which although it may not increase average income from farming, will increase the producers welfare.

The traders also stand to benefit several ways resulting again in increased returns and decreased risk. As production increases, volumes marketed in both the domestic and export markets will increase. The number of remunerative tasks which the traders can engage in will increase. Efforts to properly grade, pack, store, and time pick-up and delivery should all be rewarded by differentiation of the product and the attendant price premium. The traders face decreased losses with improved packing, storing and timing of transactions. Improved market information will eventually alert the traders to alternative markets. Improved information may allow some traders to begin to contract for production, helping assure themselves of more consistent supply and more consistent remuneration. Even with increased volumes it is difficult to predict whether the number of traders will increase or decrease and therefore whether the average trader will benefit or suffer.

The consumers in the region and in SV&G will benefit through increased availability of higher quality fresh produce at probably relatively unchanged prices, the premium paid for timeliness and quality offsetting what might have been a decrease in price.

The data gathering and analysis activities will benefit the MTA in helping it more efficiently to direct and monitor its programs. The census will provide an up-to-date profile of the farming population which can be used to analyze the "fit" between its programs and the population and to make changes deemed necessary to make the programs more effective. As the MTA develops the capability of routinely monitoring and forecasting production of the four commodities, it will increase its ability to respond to production problems in a timely manner and to monitor the progress of the Project with respect to targeted levels of production.

The St. Vincent Marketing Corporation in acting as a monoposonistic purchaser of sweet potatoes, carrots, and peanuts has been a bottleneck in the export of these commodities. The project provides the means to allow the SVMC to transform the nature of its operations at no direct cost to the SVMC. It will drop direct trade in these commodities and begin to provide services for private

trades of these commodities. The operation and the maintenance and the storage shed will be self financing as will be the source of retailing packing materials. Maintaining the marketing information service will, however, not be self financing but will, after the project finishes and after the Peace Corps Volunteer assigned to it departs, have to be funded out of general revenues. The SVMC will benefit from the work of the long-term marketing advisor as that person promotes the use of the new services and explores new services and explores new areas of services.

The Organization for Rural Development will benefit by being able to facilitate the provision of inputs to its members which will then help assure supplies which are to be sold with forward contracts to larger traders. The role of such an organization as a promoter of improved production and marketing is strengthened, but the benefits are passed on directly to the producers. The interest paid on the in-kind loans should cover the opportunity cost of the funds and the accounting costs and the price charged for the inputs should cover the purchase costs plus the handling costs of the inputs.

2. Economic Analysis

An economic analysis describes the benefits and costs accruing to the larger society. It is in part a summation of the net benefits (or costs) to the individual parties, but three special considerations are included: 1) in economic analysis, taxes and subsidies are treated as transfer payment; 2) efficiency prices are used rather than market prices; and 3) interest on capital never separated and deducted from gross returns. With respect to this project the four commodities are not taxed, and subsidies are not envisioned. The differences between efficiency prices and market prices which are important are the premium on foreign exchange earned by export and the shadow price of producer and trader labor and management inputs. Interest on capital comes into play with respect to payback on the in-kind loans from the farmers organizations.

In calculating the economic benefits to the project a partial analysis is pursued for the reasons indicated in the introduction. The summation of only the benefits to the producers and to the traders will be taken to constitute the benefits to the society. Onions, the one non-exported commodity, are omitted from the calculations. Tables VII-H-1 and VII-H-2 show the projected increase in net returns to farmers (after opportunity costs have been subtracted) for the first, second, and third year of the Project, and for all years after the Project, respectively. These Tables were constructed

assuming that without the Project both acreage and yields for the three crops would remain at their 1980-82 level for the time horizon of benefits (20 years). Production costs include variable and fixed costs only. Therefore returns to land, labor, and management are retained in the analysis as net benefits to the economy. Not included in the Tables, but calculated from the data included, the per acre net returns before and after the Project are: (1) carrots, EC\$1,200 and EC\$3,252; (2) peanuts, EC\$1,584 and EC\$3,878; and (3) sweet potatoes, EC\$1,210 and EC\$2,254. These increases amount to 171%, 145% and 86% respectively.

It was assumed that 50 percent of all acreage increase due to the Project would be from either previously uncultivated land or more intensive use of existing crop-land. Because the other 50 percent was assumed to be acreage taken from other agricultural activities, the net benefits from those activities (opportunity cost) had to be subtracted from the increase in net returns due to the crops in the Project to arrive at a true measure of net benefit to the entire economy.

Marketing firms will also benefit from increased production of these three crops. In order to estimate the net benefits to marketing firms the value added by Vincentian exporting firms, marketing margins for each of the three crops in the major export market (Trinidad) were estimated from conversations with exporting firms. The margins were EC\$2.63 for carrots, EC\$1.00 for peanuts, and EC\$1.08 for sweet potatoes. Domestic consumption of carrots, peanuts, and sweet potatoes was assumed to be 200,000 lbs., 200,000 lbs., and 300,000 lbs. per year, respectively. The export value of these crops was then computed and the value added by Vincentian exporting firms as estimated to be 90 percent of the total export value. Net benefits to these Vincentian exporting firms was then estimated to be 4 percent of their value added. Divided among the 300 traders, the net benefits amount to EC\$366 per trader each of the first two years and EC\$573 each year thereafter.

The aggregate net benefits to marketing firms by year appear in Table VII-H-3, along with yearly aggregate net benefits to farmers and costs of the Project. All net benefits and costs in this Table are shown in U.S. dollars. Conversion from EC\$ was made assuming that EC\$2.6 = US\$1.00.

The internal rate of return which is consistent with these cost-benefit schedules is 33 percent. These are direct benefits only. The Project also has indirect benefits which will accrue to producers and marketers of other crops through improvements in handling technology, market information, and market development. However, the rate of return on Project capital is still quite high when these indirect benefits are not considered.

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TABLE VII-H-1

PROJECTED INCREASE IN NET RETURNS TO FARMERS

FOR THE TWO YEARS OF THE PROJECT^{1/}

	<u>Carrots</u>		<u>Peanuts</u>		<u>Sweet Potatoes</u>	
	<u>Without Project</u>	<u>With Project</u>	<u>Without Project</u>	<u>With Project</u>	<u>Without Project</u>	<u>With Project</u>
	----- (EC\$'000) -----					
Acreage	100	135	250	295	500	500
Yield (lbs/acre)	4,000	7,500	1,400	2,000	4,500	7,600
Production (1,000 lbs)	400	900	350	590	2,250	3,800
Price (EC\$/lb)	.37	.37	1.80	1.80	.32	.32
Gross Returns (EC\$1,000)	148	333	630	1,062	720	1,216
Production Costs (EC\$1,000)	28	61	234	449	115	313
Net Returns ^{1/} (EC\$1,000)	120	272	396	613	605	903
Increase in Net Returns (EC\$1,000)	-0-	152	-0-	217	-0-	298
Opportunity Costs ^{2/} (EC\$1,000)	-0-	29	-0-	40	-0-	-0-
Increase in Net Returns After Opportunity Costs (EC\$1,000)	-0-	123	-0-	177	-0-	298

1/ Net return is the return to land, labor, capital and management.

2/ The calculation of opportunity costs assumes that 50% of the increased acreage resulting from the Project comes from reductions in acreage for other crops. The net return per acre for these other crops is assumed to be EC\$1,800.

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TABLE VII-H-2

PROJECTED INCREASE IN NET RETURNS TO FARMERS
FOR THIRD YEAR AND ALL YEARS AFTER PROJECT TERMINATION^{1/}

	<u>Carrots</u>		<u>Peanuts</u>		<u>Sweet Potatoes</u>	
	<u>Without Project</u>	<u>With Project</u>	<u>Without Project</u>	<u>With Project</u>	<u>Without Project</u>	<u>With Project</u>
	----- (EC\$'000) -----					
Acreage	100	135	250	295	500	500
Yield (lbs/acre)	4,000	10,000	1,400	3,000	4,500	9,000
Production (1,000 lbs)	400	1,350	350	885	2,250	4,500
Price (EC\$/lb)	.37	.37	1.80	1.80	.32	.32
Gross Returns (EC\$1,000)	148	500	630	1,593	720	1,440
Production Costs (EC\$1,000)	28	61	234	449	115	313
Net Returns ^{1/} (EC\$1,000)	120	439	396	1,144	605	1,127
Increase in Net Returns (EC\$1,000)	-0-	319	-0-	748	-0-	522
Opportunity Costs ^{2/} (EC\$1,000)	-0-	29	-0-	40	-0-	-0-
Increase in Net Returns After Opportunity Costs (EC\$1,000)	-0-	290	-0-	708	-0-	522

^{1/} Net return is the return to land, labor, capital and management.

^{2/} The calculation of opportunity costs assumes that 50% of the increased acreage resulting from the Project comes from reductions in acreage for other crops. The net return per acre for these other crops is assumed to be EC\$1,800.

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TABLE VII-H-3

YEARLY BENEFITS AND COSTS OF THE PROJECT

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4-20</u>
	----- (US\$ '000) -----			
AID Costs	980	734	286	0
Other Costs*	118	118	118	0
Benefits to Producers	230	230	585	585
Benefits to Marketers	110	110	154	154
Incremental Net Benefit, (Loss)	(640)	(394)	453	739

IRR = 33%

* The \$220,000 GOSV contribution, and the \$135,000 "other sources" contribution are allocated evenly over the three years.

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SOCIAL SOUNDNESS ANALYSIS

The project is designed to improve the lives of smallholder farmers and others associated with agriculture in St. Vincent and the Grenadines in three ways:-

- a) By improving the marketing system for a small number of agricultural commodities which have important export potential;
- b) By enhancing the productivity of both labor and land in the production of those same commodities;
- c) By enhancing the capability of units of the Ministry of Trade and Agriculture in the areas of:-
 - i. gathering and dissemination of information relevant to both production and marketing;
 - ii. program planning and monitoring.

Each of the program elements has to be fitted into particular socio-cultural contexts, and by that token has implications for those contexts.

A. The Marketing Component

That agricultural marketing is a problem is widely recognized by Government personnel, private businessmen, and farmers. The marketing problem has to do, first, with the process of price formation and communication of price information to farmers, and second, with the assembly and movement of farm products to the consumer. Institutions now in place deal with the several aspects of the marketing problem for the major export crops in a relatively efficient manner. In the case of bananas, the major export crop, price formation is largely determined by the protected U.K. market.

Current prices are communicated to growers through their own association. Assembly of fruit, cleaning, and boxing for shipment are handled through a set of facilities at advantageous locations in the countryside, and the fruit is moved to the port for shipment at predictable intervals when the export vessel calls. No such regularized and predictable institutional and logistic arrangements exist for the currently minor fruit and vegetable crops, or for animal products.

In view of the desirability, from a GOSV policy perspective, of diversifying the export base of Vincentian agriculture, it is essential that rational and predictable marketing arrangements be institutionalized for such commodities as are deemed to have some considerable potential for export earnings as well as potential in the domestic market. This project will initially focus on a small number of products, with other products to be added as institutional capabilities permit, and/or with other commodities to be substituted as market prospects change. Current planning, subject to change as conditions change, calls for attention to carrots, peanuts and sweet potatoes. These crops are all currently grown in St. Vincent and the Grenadines, and both regional and domestic market potential exists.

The recent history of vegetable and fruit market availability has been one of shortages and gluts. Production has not been well coordinated with demand in the market. Traders in both the export and domestic markets have frequently not been able to predict the flow of commodities to the market; consequently they have not been able to assure buyers of delivery at some future date and at a determined price. Farmers have not been able to formulate their production plans to take advantage of market demand, and have therefore tended toward extreme diversification in order to minimize risk. The perishable nature of fruit and vegetable products and the lack of even short-term cool storage, makes it even more difficult to cope with existing market uncertainties.

In addition to market price uncertainty, and the lack of price information on the part of producers, there are some considerable problems in the assembly of most fruits and vegetables from widely dispersed growers, with the establishment of grades and standards to meet market specifications, and with the transport of produce to the central market in Kingstown and to regional markets. The focus of this project on smallholders who diversify their production means that produce for market is derived from many different individuals, in diverse locations and typically in small lots.

Farmers sell some produce to private traders (hucksters), some of whom are producers themselves. The traders purchase relatively small quantities for direct sale in the local fresh market. Traders sometimes have their own transportation but typically arrange for transport on trucks, buses or the more frequently available mini-vans which traverse the countryside. The establishment of prices paid to farmers, the establishment of price incentives for different grades of product and the minimization of loss of quality as the produce moves to market, are all made difficult to achieve by the complexity of the widespread network of small farmers, traders

and transporters, each of the many actors dealing with only a small fraction of the aggregate at any given point in time.

Farmers also sell substantial amounts of produce to traders in the regional market (traffickers). Purchase from farmers, assembly of produce for shipment and transport to Kingstown for export are handled in the same way as described above, though the transactions would tend to involve somewhat larger lots. The problems involved with moving produce to the market are also the same, with the added element of loss in quality as products are moved without protection from the hot sun to regional markets at considerable distances.

Impacts, Both Intended and Unintended:

The objective of the marketing component is to seek out favorable markets for select commodities, rationalize production planning by providing price information to farmers and rationalize the movement of produce through the market channel to lessen losses in quality. As success is achieved with the initially selected commodities, it is the intent that the same procedure be applied to other commodities, thus the potential for a spread effect is built in.

The project is targeted on smallholder producers and small businesses associated with agriculture. Rationalization of the marketing process is intended to increase returns to those participating and those benefits should be widespread. Nevertheless, as improvements in the process are made some participants may be more able or willing to participate to their own advantage than others. Thus the possibility of structural change in both the production and marketing systems exists and must be monitored. It is highly unlikely that either the production or marketing systems will shift significantly toward aggregation into larger firms in the short run, but, to repeat, change must be monitored. Inclusion of a new census of agriculture in the project is highly relevant in this regard is that a bench mark against which changes can be measured, will be established.

Of particular significance for this project is the fact that at least a substantial minority of the producers are women, and virtually all of the traders who move produce from farmers into the local and export market are women. Women will therefore figure centrally as beneficiaries of project efforts, and to the extent that change in the marketing process may involve risk for some participants, women will also be subject to some risk as change

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occurs. Any potentially negative impacts will have to be carefully monitored in the periodic evaluations of the project.

Finally, a potential and unintended consequence of rationalizing the marketing process, and the production process as described below, may be that a significant fraction of the total production of a given commodity will be shifted in the direction of the middle and upper class consumer market. If this were to occur it could reduce the availability of poor quality but relatively cheap produce to poorer consumers. Although such a consequence is unlikely, here again such a possibility should be considered in the project monitoring process.

B. The Production Component

Agricultural production in St. Vincent and the Grenadines is clearly favored by a climate conducive to year-round production, by some good soils, and by an experienced and capable labor force. Production is limited to a degree by the relatively dry conditions of the December to April period, and, in the case of the Grenadines, by more substantial water shortages. Crop production on some of the more steeply sloping land also raises serious questions about soil loss due to erosion. It is also the case that the generally labor intensive production methods can result in periodic labor shortages when peak seasonal demands for labor occur. Nevertheless, the potential for improved production for a range of products clearly exists.

Fresh vegetables and many fruits are for the most part produced by smallholder farmers. Production methods, by and large, do not compare favorably to the methods used for the major export crops and, as a result, production costs are sufficiently high to present problems in marketing. A comparison with banana production may again be appropriate. Varietal selection, production methods, input supply, credit for purchase of inputs, and product handling methods to enhance quality are all handled through the growers' association, which also provides instruction to farmers on the range of problems they face. With some notable exceptions, most of the commodities which are currently less prominent in the export market are lacking the kind of infrastructural support which is in place for bananas.

This project is intended to improve the productivity of smallholder farmers in the production of selected commodities. Those commodities already mentioned for market promotion are to be the initial focus of the production enhancement thrusts. As mentioned earlier, the addition and/or substitution of other commodities is envisioned, thus a spread effect can be anticipated.

Project efforts to increase productivity will necessarily include careful selection of improved varieties from the global stock and local testing of selected varieties to determine whether the selections can in fact perform well under local conditions.

In addition, it will be necessary to provide soil testing capability to determine what kinds of soil amendments are necessary, a means of acquiring and distributing any such soil amendments to growers, and a means of financing the purchase of soil amendments by the grower. Other purchased inputs and means of financing such purchases will also be required. Among those other purchased inputs are chemicals to be used for pest control, and these may serve to illustrate the general need for training for both extension workers and their farmer clients in the proper use of the entire spectrum of inputs and production methods. Chemicals, for both weed and insect pest control, highlight the general need for training only in the sense that the consequences of improper use can be quite serious. In the case of chemicals, the selection of chemicals for use, mixing, and application of those chemicals, as well as disposal of containers must all be carefully monitored.

The project intends to facilitate long-run participation of farmers, many of whom are women, in the improved production program via a farmers' organization. The dissemination of information to farmers, input supply, and supervision of credit use will all be facilitated by such an organization, and the marketing component of the project will also be served by using the organization as a means of communicating price and other market information.

Impacts, Both Intended and Unintended:

Rationalization of the production process for selected commodities, as was indicated for rationalization of the marketing process, is designed to have widespread benefits for smallholder farmers. As was mentioned in the context of marketing, there is also the potential for altering the structure of agriculture as production methods are changed, by virtue of the fact that some producers may be unwilling or unable to capitalize on the change process. Increasing the capital intensity of production even moderately is intended to enhance productivity and thus net returns to the producer. By the same token, increasing capital intensity increases risk to the producer. Such risk can be minimized by supervising the use of credit in the production process. Nevertheless, project monitoring and project evaluation will have to be attentive to the question of risks to the producer as well as to the possibility of change in the existing structure of agriculture.

The risks associated with the use of chemicals for weed and insect pest control in crop production were mentioned above, and such risks need only be noted here again to indicate that they should be considered in the process of project monitoring and periodic project evaluation.

C. The Program Planning, Implementation and Monitoring Component

This third component of the project is concerned with several somewhat discrete elements which serve to enhance the linkage between production and marketing, undergird the planning process for agriculture as a whole, and enhance the Ministry of Trade and Agriculture's ability to implement both the present and other development projects.

A first element of this project component is the provision of a new Census of Agriculture to update the data base for agricultural planning in general and serve as a bench mark against which to measure future change. The last such census, completed in 1972, is no longer useful for current planning though of course it will be useful for trend analysis.

The second element of this component of the project is an enhanced "special studies" capability for the Ministry of Trade and Agriculture, presumably to be located in the Agricultural Statistics Unit of that Ministry. Such studies will involve relatively small samples and will ideally be based on the sample frame designed for the Census. Topics will include periodic estimates of plantings and thus estimates of product volume to be expected in the market at a future date. Other special studies might focus on farmers' perceptions of the price information they receive as well as perceptions of information on production methods.

The third and last element of this project component involves training, mostly of an in-service nature, for personnel of the Ministry of Trade and Agriculture and other agricultural organizations. Project planning and implementation are to be stressed, as well as project monitoring and evaluation, in order to maximize the utility of the scarce resources available for agricultural development. Any such training will be carried out on a continuing basis.

Impacts, Both Intended and Unintended

The primary beneficiaries of this component of the project are those public officials and private business persons directly involved in development planning and project implementation. In the longer run farmers, traders, and input suppliers, as well as consumers will benefit as the goal of more efficient development program implementation is achieved. It is not expected that other than beneficial effects need be considered for this component of the project. Spread effects are to be expected to the extent that project implementation efficiencies are actually achieved.

D. The CARDI Survey of Small Farmers

A 1978/79 random sample, drawn from five of the eight agricultural districts, consist of 120 farmers who controlled a minimum of one acre and a maximum of five acres of farm land and who were willing, if chosen, to cooperate with CARDI field staff in the Small Farm Cropping Systems Research Project. The following are excerpts from the project "Final Report 1978-82," Volume II, pp. 109 - 116.

1. Background

(a) Age, Sex and Ethnic Origin

Seventy per cent of farm operators in the St. Vincent sample were male. The mean age of the sample is roughly 50 years and the modal age slightly less, viz. The majority of the farmers (80 per cent) are of African descent, with nearly seven per cent East Indian and 12 per cent of mixed races. Less than one per cent of the farmers is of Amerindian (Carib) origin.

(b) Literacy, Martial Status and Household Size

The level of literacy among farmers is relatively high. Roughly 72 per cent can read and write while a further seven per cent read but cannot write. No farmer was educated beyond primary school. The majority (65.8 per cent) reached Standard 4 or better (i.e. at least 4 years of primary school). Nine per cent of the farmers had no schooling at all.

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The majority of small farmers are either married (70.8 per cent) or live in common law relationship (15.8 per cent). Only 6.7 per cent are single. The mean household size is six and the modal size is eight. Each farm operator has roughly three dependents.

(c) Stability

Judged by their length of residence in the place at which they were located at the time of the survey, Vincentian small farmers are a relatively shifting or moving group. Although the modal age of the farm operator is 48, the modal length of residence in his present locality is less than 10 years. The number of replacements required for farmers who were selected in the original sample but who had since emigrated supports this observation.

(d) Occupation

The sole occupation of the majority of the sample is farming (64 per cent). Fourteen or 11.6 per cent of the total are also engaged in trades such as carpentry and masonry, and a further eight per cent are also employed in agricultural produce. Fewer still are employed as unskilled laborers in road gangs, in non-agricultural commercial enterprises (shopkeeping) and in fishing.

(e) Family Income

It was anticipated in preparing the questionnaire that small farmers would find it difficult to give a dependable estimate of their annual income from all sources, or even if they could provide such an estimate, might be reluctant in disclosing that information. It was decided to seek this information in a round about manner. First the farmer was asked who besides himself contributes to the total family income. Other questions asked for the proportion of the total income (with a corresponding cash estimate) spent on the various family, farm and other expenses. From responses to these questions it was anticipated that estimated total family incomes could be computed.

Even this design failed to elicit the desired data from most Vincentian small farmers. Only about 20 per cent of the farmers (i.e. 25) provided any figures from which estimates of annual family incomes could be computed. Of these 25 farmers, 10

had annual family incomes of EC\$500* or less, and the remaining 15 (i.e. 60 per cent) had incomes ranging between \$500 and EC\$5,000 per year.

Farmers were more open in disclosing who besides themselves contributed to the income of the household. In more than 40 per cent of the houses, one or more sons contributed to the family income as does the spouse in 25 per cent of the households and the daughters in 28 per cent of the sample. In some cases other relatives and even non-relatives also contribute to the family's total income.

(f) Nutrition

Root crops and rice in that order constitute the staple food of the Vincentian small farmer. Well over three quarters of the sample eat rootcrops and rice very often, i.e. several times a week. Most of the rootcrops consumed in the home are grown by the farmer himself, whereas the rice is purchased. The vast majority of the sample (more than 70 per cent) also eat bananas very frequently.

The figures indicate that a very high proportion of small farmers (more than 80 per cent) consume vegetables very often, and that most of what is consumed is home grown. The validity of these responses is doubtful, taking into account the very low frequency of occurrence of vegetables in the cropping system of these farmers. In many parts of the Eastern Caribbean the staple foodcrops are often referred to as "vegetables". Although this usage is not common in St. Vincent it is suspected that in the interviews some small farmers might have interpreted "locally-grown foodcrops" for "vegetables".

Virtually all respondents eat meat sometimes, but very little of what is eaten was produced by the farmer himself. A high proportion of small farmers reported also consuming eggs, milk, fish and fruits very often.

2. Farm Oriented Factors

(a) Time Spent and Labor Used on the Farm

For the small farmer who is in essence both farm manager and farm worker, the amount of time he spends on the farm largely determines the productivity of his farm. Assuming that the farm is sufficiently large to provide opportunity for his productive

employment, time spent on the farm will indicate the extent of an individual's interest in, dedication to, and belief in the future of agriculture.

The modal Vincentian small farmer spends six to eight hours per day on his farm during the crop season when demands on his time for planting pest and disease control, harvesting, etc., are high. In the out-of-crop season he spends from two hours to four hours daily on the farm. Nearly three quarters of all farm operators (72.5 per cent) are assisted with work on the farm by at least one of the members of the household.

In situations of scarcity of money and/or labor, in an attempt to ensure the more timely performance of critical and labor demanding farm operations such as land preparation, planting and weeding, small farmers sometimes resort to shared labor on each others farms (variously called lend-land, coup-de-main, swap-labor, in the islands). Twenty-eight (28) per cent of the sample used shared labor on the farm.

(b) Use of Farm Records

In St. Vincent less than one in 10 of the farmers sampled kept records and the records kept by those few were rudimentary.

Most farmers did not keep records because they thought it was too time consuming (38.8 per cent) or because they did not consider it necessary (22.5 per cent). Some explained they kept no records because they could not read or write (10 per cent) or because they did not know how to (4.5 per cent).

(c) Innovativeness

In order to get some idea of how alert they were to development taking place in agriculture around them farmers never asked whether they were familiar with any new plan or seed varieties or new agricultural practice. The Windward Islands' banana industry is very dynamic and has over the past year introduced to farmers new chemicals and methods of disease control and new control practices. And yet only two of the 120 small farmers were familiar with what they considered a new variety or practice.

The relative innovative or adoption tendency of a farmer may also be indicated by examining the number of technologically recommended innovations he practises, and the degree

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to which these innovations are transferred from one crop or enterprise to another. Their commodity associations in the Windward Islands virtually force banana growers to use fertilizers in growing that crop. All export fruit is sold through the associations which, as part of the services they provide from a cess levied on all produce sold, supply fertilizers to each producer based on the volume of his sales.

Almost 70 per cent of the farmers growing bananas use fertilizers on the crop. However, the use of other non-fertilizer chemicals by these banana growers is very low indeed. Less than 20 per cent use chemical sprays and none use other agricultural chemicals or organic manure.

The position is virtually identical with the other major crops and groups of crops grown in the island. Nearly 90 per cent of the plantain growers use fertilizer on that crop but use no other type of agricultural chemical. Seventy per cent of root and tuber crop growers use fertilizer while less than one per cent of their number use chemical sprays and other agricultural chemicals. With vegetables, legumes and maize, again relatively high proportions of the growers use fertilizers but not other agricultural chemicals.

It would seem therefore that there has been some transfer of technology from banana growing to the management of other crops. The influence of this industry on technology transfer is even better understood when it is realized that the Banana Association is virtually the sole importer of fertilizers. The fertilizer imported for bananas is used by small farmers on all their crops, and even by non-banana growers who, when they cannot obtain the commodity from the Banana Association, can nearly always depend on getting some to buy from some neighbor willing to trade part of his allocation for cash.

(d) Persons consulted by Farmers

The largest proportion of small farmers (40 per cent) consult no one in arriving at farm planning decisions. The spouse is the person most frequently consulted by those who seek advice (38 per cent). Less than two per cent of the sample consult the extension officer.

In deciding whether or not to adopt a new variety of practice the opinion considered to be most valuable is also that of the spouse. Seventy-nine or nearly 70 per cent of the 118 farm operators with spouses considered that obtaining the opinion of the spouse was important. Others whose opinions were considered important in arriving at a decision were, in descending order, the extension officer, the son or daughter, a relative and the neighbor.

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3. Credit Facilities and Practices

For the year preceding the survey only two farmers from the sample had obtained credit through Commercial or Development Banks. One farmer who used the Production Credit Scheme enthused his preference for this source because they wait until you reap the crop to pay back. However, several farmers who did not use this credit source complained that there is too much red tape and too long a delay before obtaining a loan. One farmer complained that he had applied to the Agricultural Bank for a loan and was getting the run round for a long time, then he approached a commercial bank and obtained immediate credit

4. Marketing Facilities and Practices

More than half of the 97 farmers who could name and estimate the distance of the nearest depot from their home live more than five miles from that depot. In fact, there are some 23 farmers who live, 11 and more miles away from the nearest depot.

In the circumstances the farmers' main suggestions for improving the marketing systems were:

- (a) increase the number of access roads so that farmers could more easily obtain transport to the market,
- (b) increase the number of collection points so that no farmer would be living very far from a depot, and
- (c) the availability of better and more dependable transport to take farmers to the market.

The need for marketing cooperatives was suggested by only one farmer in St. Vincent as a possible way of improving the agricultural marketing situation.

The only market channels not reported as being used by the small farmers were hotels and supermarkets. For the root crops and vegetables there was an expressed preference for selling to the hucksters and traffickers who, it is claimed, pay a better price than the Marketing Corporation although they purchase the produce right on the farm.

5. Communication Channels Used

The largest proportion of the sample was either traditional in trying to solve its problems solely through self-experience, or

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was very sure of (overly so) its technical knowledge, or contained some of both types. Members of this group (36 per cent) stated that they sought advice from no one at all. Twenty-nine per cent of the sample would seek advice from the extension officer and another 23 per cent from either a relative or good friend.

In order to obtain information on improved farming practices more farmers visit their neighbor's farms and demonstration stations (22 per cent). Fifty per cent of the farmers know the extension officer but 37 per cent report that he never visits their farm.

More than 80 per cent of the sample listen to radio and some of the kind of information they would like to receive through that channel includes technical information on crop and livestock production, market information (current market prices) and Government agricultural incentives available to the farmer.

6. Membership in Groups

The degree of group membership among small farmers in St. Vincent is very low, and of those who join groups their spiritual or material benefits. Twenty-four per cent of the sampled farmers belong to a church group and five per cent each belong to a sou-sou or co-operative.

7. Attitudes

Most farmers in the St. Vincent sampled were of the opinion that the single most important factor for one to consider in choosing a job is how much money they can make out of the job (80 per cent). The rest said that personal liking for the job was for them the single most important factor.

The St. Vincent small farmer is thus seen as an almost totally economic oriented individual. Status, long-run potential for self-improvement and such other factors play no part in his decision-making so far as a career choice is concerned. This suggests therefore that in dealing with these farmers stressing the economic benefits (and demonstrating this) of whatever is recommended would be the surest way of influencing their practice adoption.

MTA Office Extension Building

Attached are conceptual sketches and specifications for the proposed MTA Office Extension Building. The building selected is of simple construction: reinforced-concrete foundations, columns, and beams; concrete block walls; and a timber truss roof structure with galvanized iron covering. The total estimated cost of the project is US\$150,000, including costs of A/E services. The location of the building shown on the site plan is tentative; the architectural/engineering (A/E) firm selected to develop project designs should investigate thoroughly alternative building sites and select the location most appropriate for the MTA's requirements. The layout proposed is simple and would provide approximately 2600 sq. ft. of useable office space. This should be ample to meet the Ministry's current needs. Again the A/E firm should consider alternative floor plans and develop one most suitable for the MTA's needs.

Preliminary Cost Estimate

Building Construction (US\$37.50/sq. ft.)	<u>US\$</u> \$129,600
Architectural Engineering Services (approx. 15%)	<u>20,400</u>
Total Project Cost	<u>\$150,000</u>

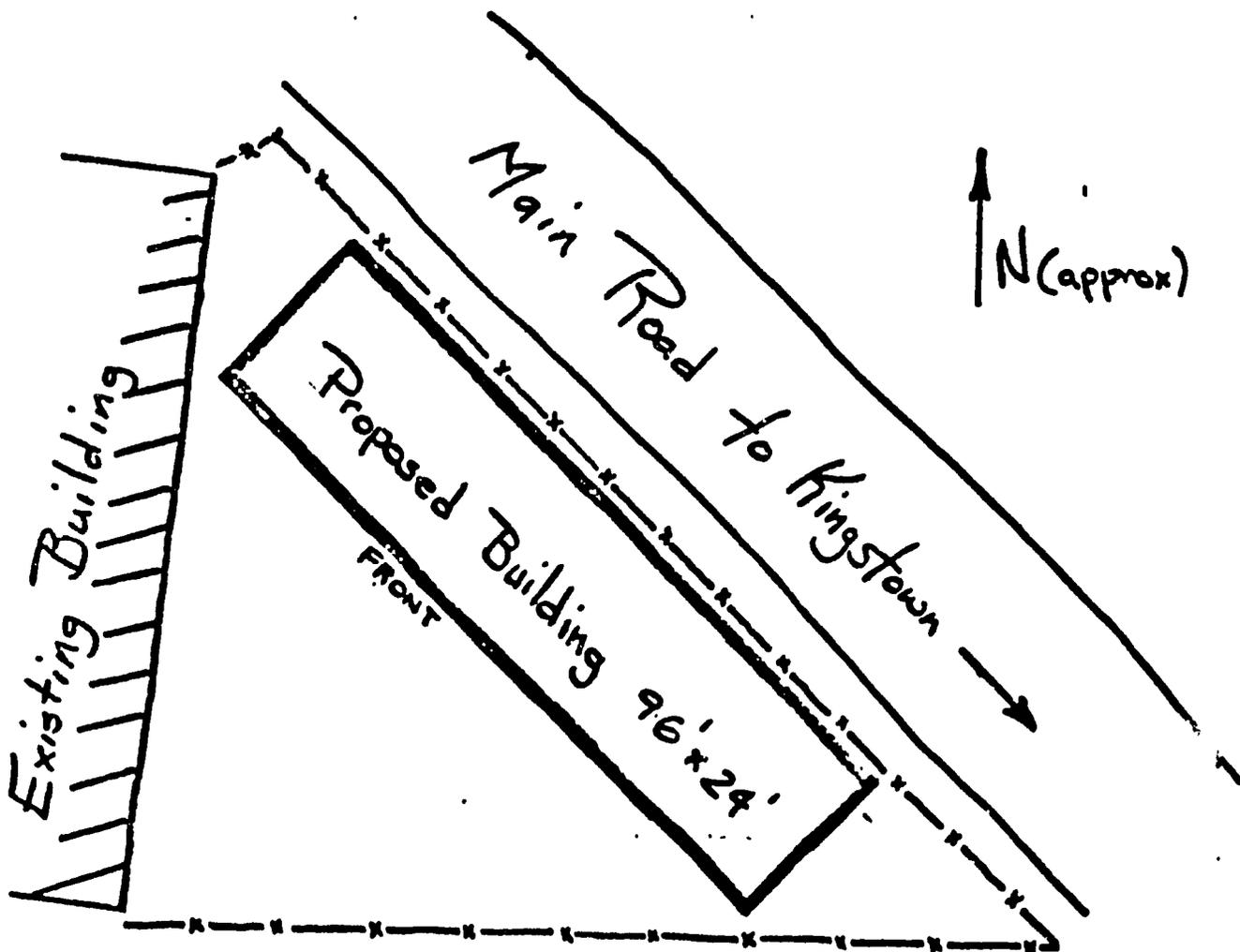
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SPECIFICATIONS FOR PROPOSED MTA BUILDING:

STRUCTURE: REINFORCED CONCRETE FRAME (COLUMNS AND BEAMS)
6" CONCRETE BLOCK EXTERIOR WALLS
4" and 6" CONCRETE BLOCK INTERIOR WALLS AND PARTITIONS

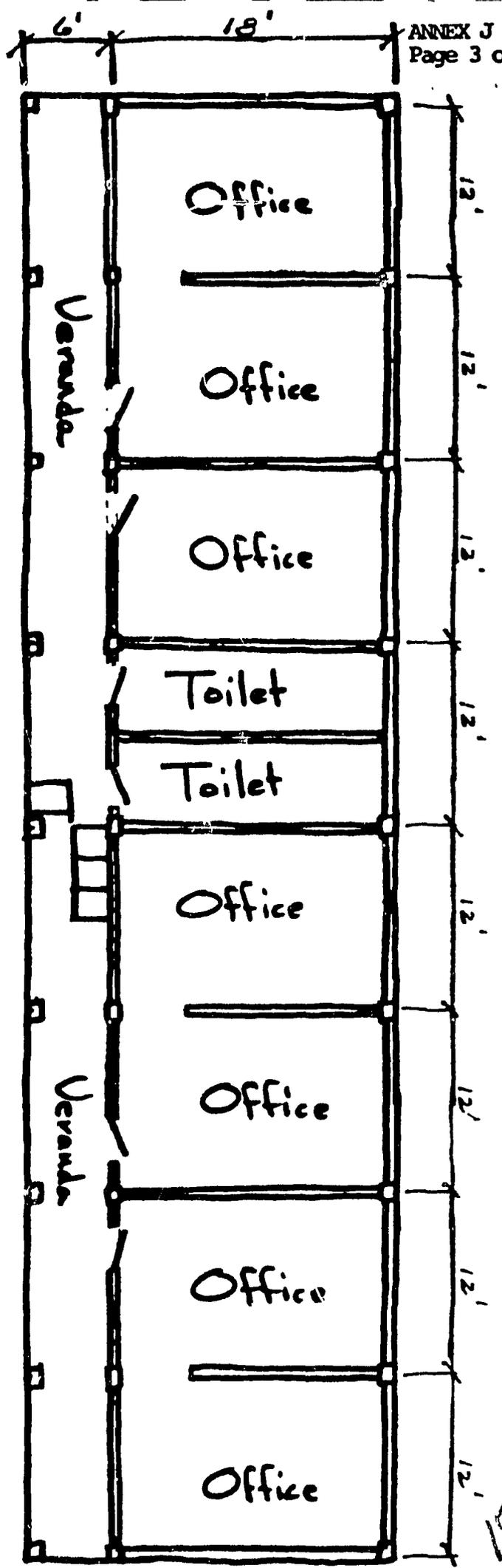
FOUNDATIONS: REINFORCED CONCRETE MAT COLUMN FTGS.
REINFORCED CONCRETE STRIP FOOTINGS FOR ALL
EXTERIOR AND BEARING WALLS

ROOF: TIMBER TRUSS MAIN STRUCTURE (HIPOR GABLE)
GALVANIZED IRON SHEETING
ALL ROOF ELEMENTS TO BE PROPERLY SECURED FOR
HURRICANE-FORCE WINDS



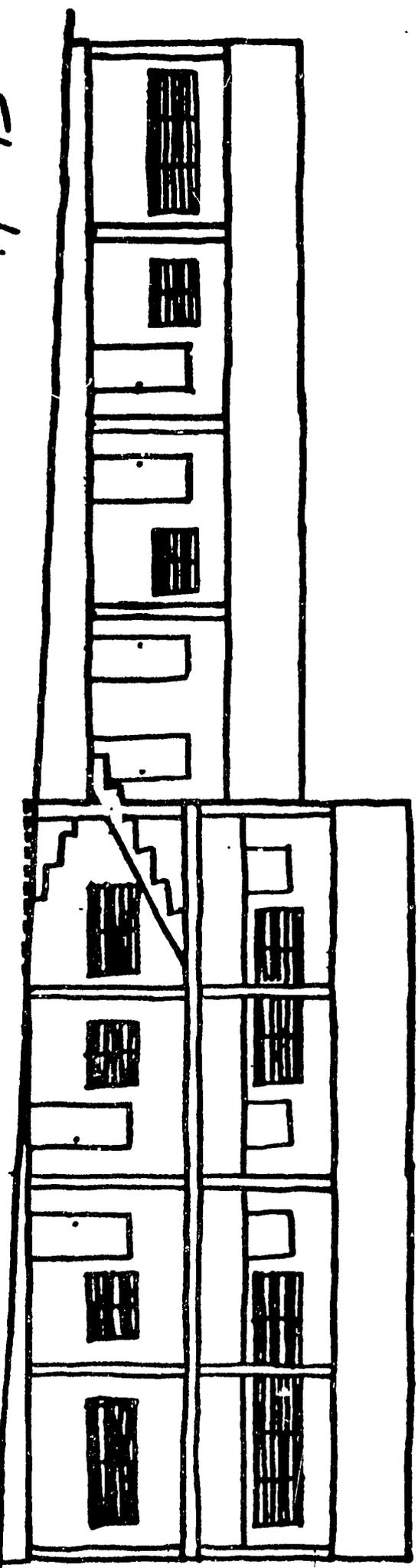
Site Plan

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Floor Plan (first floor only)

Elevation



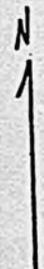
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Covered Marketing Area

A pre-fabricated structural steel building has been selected for the marketing storage area structure. The selected engineering firm will be responsible for the design of the foundations and concrete floor slab, will inspect construction, and develop a set of specifications for the steel building suitable for inclusion in an AID Invitation of Bids (IFB). The construction contractor will be responsible for all site preparation and earthworks, will construct the foundation and floor slab, and erect the steel frame building. A cost estimate for the design, procurement and erection of this structure follows:

	<u>US\$</u>
Site Preparation, Foundation Slab, and Paving	\$ 34,331
Pre-Fabricated Building, C.I.F. St. Vincent	49,249
Building Erection	20,884
Lighting	<u>11,607</u>
SUBTOTAL	116,071
Engineering Services (12%)	<u>13,929</u>
TOTAL SUBPROJECT COST	\$130,000

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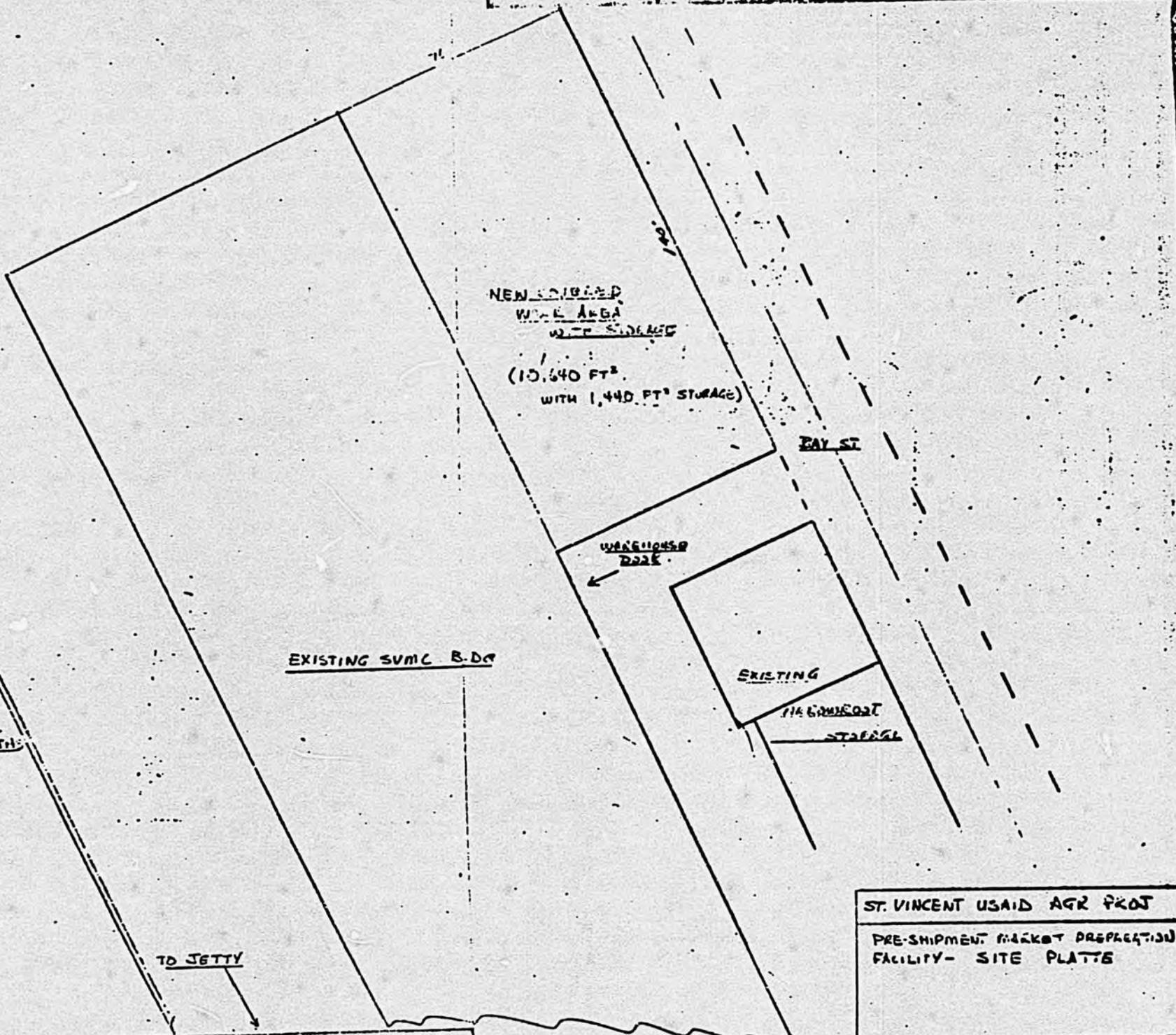


NEW
SAILOUT
BERTH

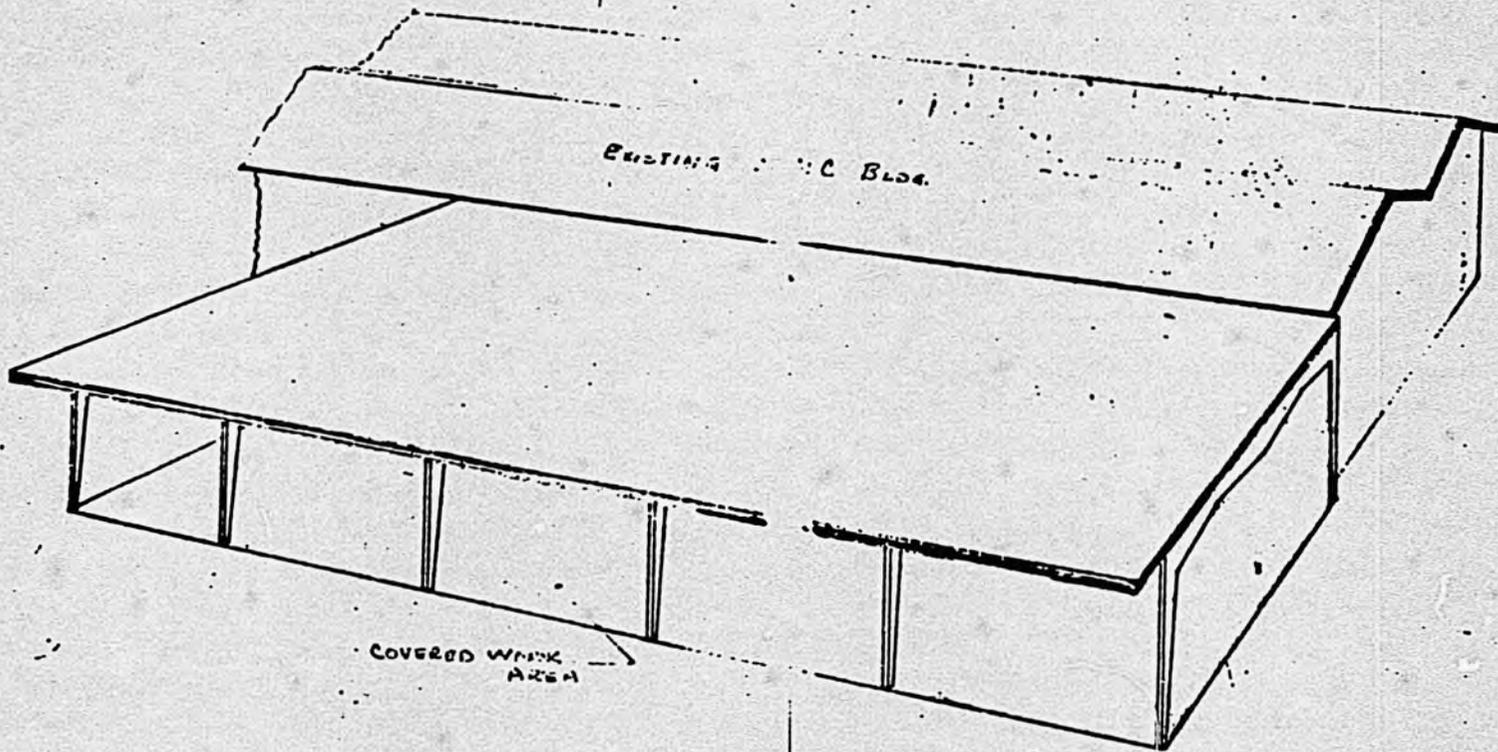
KINGSTOWN BAY

TO JETTY

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ST. VINCENT USAID AGR PROT
PRE-SHIPMENT MARKET PREPARATION FACILITY- SITE PLANS

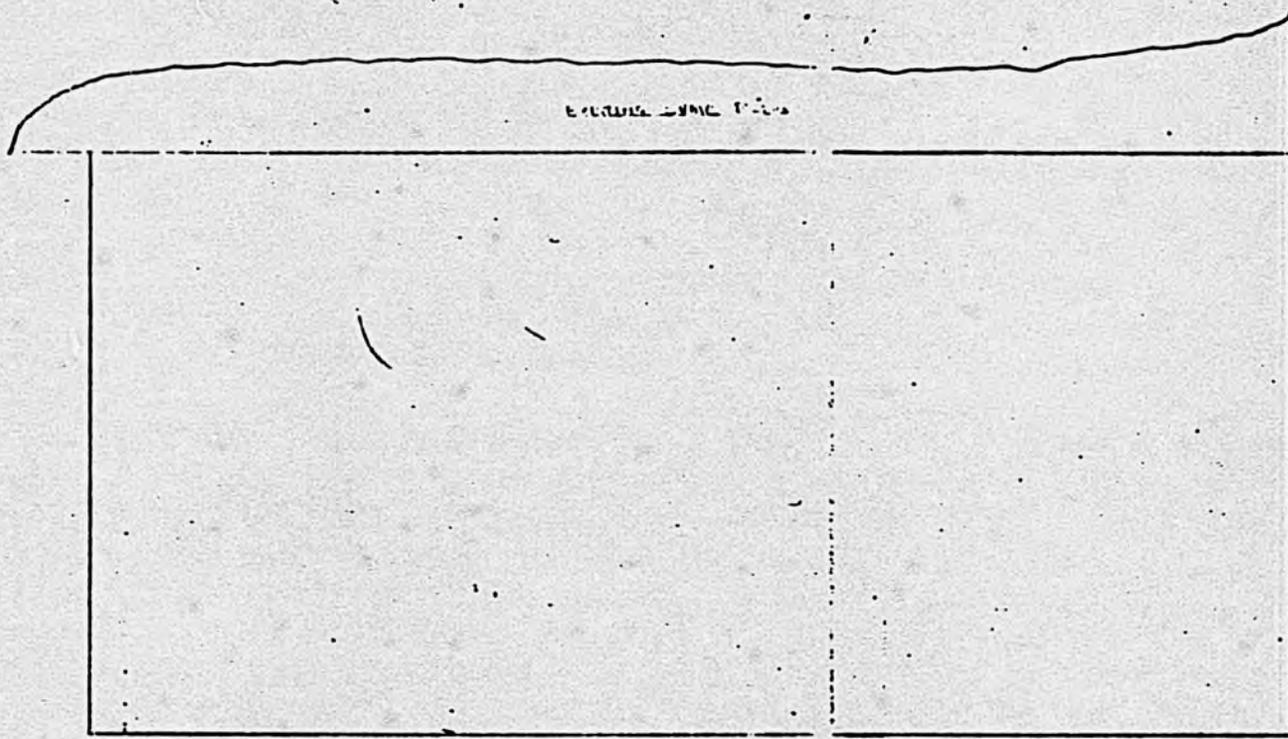


EXISTING BLDG.

COVERED WORK AREA

ST. VINCENT USAID AGC. PH. 3.
PRE-SHIPMENT MARKET PREPARATION AND SHORT TERM STORAGE
CPA: 1/1/66

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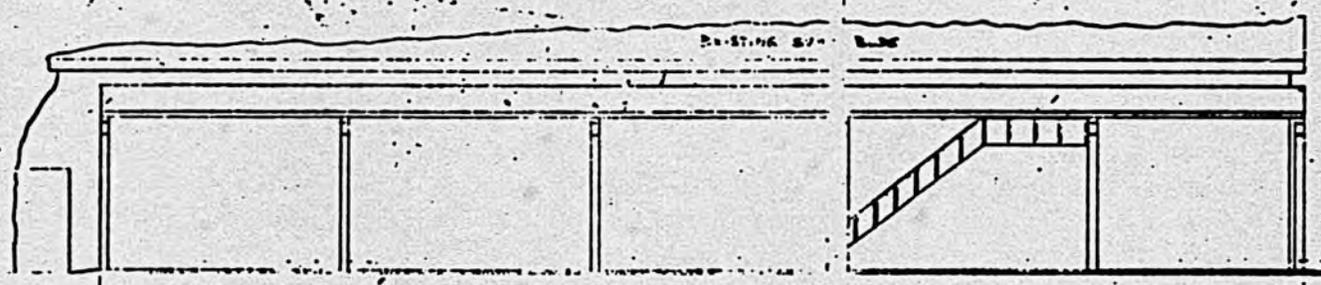


EXISTING CONC. FLOOR

PLAN VIEW



SIDE ELEVATION



140'

FRONT ELEVATION (FACING WAY ST.)

ST VINCENT USAID AGC 2665

PRE-EMPLOYMENT TRAINING FACILITY - WORK AREA (PLAN AND ELEVATIONS)

SCALE: 1/8" = 1'-0"

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~~ANNEX K~~ ENVIRONMENTAL ASSESSMENT

ST. VINCENT AGRICULTURAL DEVELOPMENT PROJECT

JULY 1983

Prepared by:

Dale G. Bottrell

University of California

Consortium for International Crop Protection

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ACRONYMS/ABBREVIATIONS

- AID - United States Agency for International Development
- CARDI - Caribbean Agricultural Research and Development Institute
- CICP - Consortium for International Crop Protection
- EPA - United States Environmental Protection Agency
- FAO - Food and Agriculture Organization of the United Nations
- GOSV - Government of St. Vincent and the Grenadines
- IPM - Integrated Pest Management
- LD₅₀ - LetaI dosage of a pesticide (expressed in milligrams of active toxicant per kilogram of body weight of the test organism) required to kill 50 percent of the laboratory test population (usually rats)
- MTA - Ministry of Trade and Agriculture of St. Vincent and the Grenadines
- RPAR - Rebuttable Presumption Against Registration (a pesticide procedure of the United States Environmental Protection Agency)
- USA - United States of America
- WHO - World Health Organization of the United Nations

SUMMARY

This Environmental Assessment examines those Project actions considered to represent potentially significant adverse impacts on the human and natural environment and sets forth measures required to mitigate the adverse effects. The potentially most significant impacts are: soil erosion, over fertilization, interference with wildlife resources, and pesticide abuse. Pesticide use in the Project represents the potentially most serious environmental hazard. Pesticides are currently used widely in St. Vincent, and their use has already resulted in some human health and environmental problems. The Project could result in a significant increase in use in pesticides in the target crops, carrots, peanuts, and sweet potatoes. If safeguards are not established at an early stage of the Project, the use of pesticides will increase and so will the potential for pesticide-induced problems.

Initiatives in training, extension, monitoring, and regulatory action required to ensure against unreasonable environmental impacts are set forth. A comprehensive program in pesticide management is outlined and includes the following:

- * Identification and provision of specific pesticide products, application procedures, and safety precautions for incorporation in the Project
- * Appointment of a Pesticide Coordinator to monitor pesticide use in the Project and to coordinate training, extension, and other Project activities required to ensure correct and safe use of pesticides
- * Development of a series of new in-country short courses in pesticide management and integrated pest management for agricultural extension workers, health officers, nurses, crop protection workers, and others
- * Recruitment of two inspectors/trainers to assist in the development and implementation of pesticide regulations and enforcement procedures provided for in St. Vincent's Pesticide Control Act of 1973.

The Pesticide Control Act provides for the control of the importation, sale, storage, and use of pesticides and authorizes the formation of a Pesticide Control Board to carry out these activities. However, the Board has not been established and the pesticide regulations and enforcement procedures have not been developed. Thus, the Project affords an opportunity to stimulate

activities provided for by the Pesticide Control Act through appointing and training appropriate enforcement personnel and providing technical assistance and supplies.

THE PROJECT'S OBJECTIVES AND ACTIVITIES

The St. Vincent Agricultural Development Project, as described in the main part of the Project Paper, is being implemented to improve the lives of small farmers and others associated with agriculture in St. Vincent and the Grenadines (GOSV) in three ways:

- * By improving the marketing system for selected agricultural commodities that have important export potential
- * By enhancing the productivity of both labor and land in the production of these commodities
- * By increasing the capability of the Ministry of Trade and Agriculture (MTA) for gathering and disseminating information on production and marketing and for program planning and monitoring.

The Project will support a variety of activities aimed at increasing the production and marketing of three primary crops grown for export: carrots, peanuts, and sweet potatoes. The production/marketing activities will include the following:

- * Identifying and disseminating improved technologies through adaptive research, technical assistance, and extension
- * Providing production and storage inputs (fertilizers, pesticides, planting and harvesting equipment, and storage facilities) and credit required to mobilize these technologies
- * Developing producers' associations
- * Strengthening producers' and exporters' markets.

PURPOSE OF THIS ENVIRONMENTAL ASSESSMENT

This assessment of the foreseeable impacts of the Project on the human and natural environment was prepared in accordance with the United States Agency for International Development's (AID) Environmental Procedures (22CFR Part 216) of Regulation 16 of the Code of Federal Regulations. In the Project Identification Document

that preceded the present Project Paper, an Environmental Assessment was recommended, especially in regard to the use of pesticides or other toxic chemicals proposed for the Project.

Before assessing the Project's environmental impacts, it is necessary to describe the environmental setting where the Project activities are to be carried out.

THE ENVIRONMENTAL SETTING

A. Location and Population Characteristics

The country of St. Vincent and the Grenadines is a collection of windward islands in the Eastern Caribbean, resting on longitude 61°10' between latitudes 13° to 13°22'. The bulk of the country's population, estimated at 114,000 (mid-1982), live along the coasts. Steep terrain limits inhabitation in much of the interior portion of the islands. The total land area is about 388 square kilometers. The country's overall population density is about 282 persons per square kilometer, compared with a population density of about 535 persons per square kilometer in the arable portion of the country.

The country's population growth rate is estimated at 2.1 percent per year. The adult population literacy rate is estimated at 82 percent. About 90 percent of the primary-school aged children are enrolled in school.

B. The Agriculture

Vincentian agriculture is favored by some good soils and a climate that permits year-round production of many crops. A large number of crops are raised for local consumption and for export. In addition, crop farmers commonly raise livestock and poultry which they consume themselves or sell at the local markets.

One-third of the total land area of St. Vincent and the Grenadines is classified as "agricultural land" of which 22 percent is cultivated. Seventy-eight percent of the farms are under two hectares. The remaining 22 percent of the farms account for about 78 percent of the cultivated land. The majority of land cultivated by small farmers is large-estate land belonging to the government or private owners. Of the five government estates, two are now being resettled and redistributed.

Farming is often combined with local employment or income sources such as that derived from overseas remittances, for example. A large portion (up to 44 percent, according to some estimates) of the labor force is female. Some 30 percent of all farm operators are women, and women provide most of the private marketing services. Women are the primary decision makers in the majority of rural households and significant participants in the country's agriculture.

Banana is the largest export crop in St. Vincent. About 85 percent of the export bananas are produced by farmers who manage less than 10 hectares. Other important crops grown for export include arrowroot, coconuts, sweet potatoes, yams, other traditional root crops, carrots, and specialty crops such as ginger.

The country's agriculture, its support services and industries, and the land tenure and ownership system are described in greater detail in other sections of the Project Paper and in the report "St. Vincent and the Grenadines Agriculture Sector Assessment" cited at the end of this Environmental Assessment (MUCIA, 1982).

C. The Natural Resources

The yearly rainfall ranges from about 380 centimeters (150 inches) in the central mountains to 152 centimeters (60 inches) at the coasts. Daily temperature varies between 15.5°C (60°F) and 31°C (88°F).

On the Island of St. Vincent proper, where all of the Project activities will take place, the highest rainfall occurs in the most mountainous area in the North. The driest area is in the southeast coast. About 70 percent of the yearly rain comes from May through November. The period of January to April is the driest. The dry season is much more pronounced in the coastal areas than in the mountains.

Geologically, the country originated from a chain of volcanoes whose craters coincide with the central range of mountains and hills. The soils are of volcanic materials of intermediate and basic origin with various degrees of weathering and age. The predominant soil orders are Inceptisols, Entisols, Ultisols, and Vertisols with Trocept and Ustult suborders predominating. Soil fertility varies considerably, and acidity and phosphate deficiencies commonly occur. Some micronutrient imbalances can be expected on the most recently deposited volcanic ash soils.

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Much of the island has been cleared of its native vegetation and planted in agricultural crops. Dense stands of native vegetation remain only in the central highlands. The crests of the steeply sloping ridges near the coast are often covered with a dry-scrub woodland. The central mountain vegetation is of a secondary nature with areas of rain forest at the heads of some of the larger valleys. Native vegetation has stabilized steep slopes in uncleared areas and allowed soils to develop. The MUCIA (1982) report provides greater detail on the distribution of nonagricultural vegetation in St. Vincent.

In the arable land areas, remnants of forests exist only in the central mountains. The forests serve an important role in absorbing the heavy rain and gently directing the moisture to the outlying drainage basins.

Forest management in St. Vincent is limited mainly to protecting the existing forests. Reforestation has been practiced in some catchment areas and along banks of streams and rivers. Five of the main watersheds of the island are under forest management with the aim of increasing stream flow for domestic use, hydroelectricity, and agriculture. The reforestation efforts need to be maintained and expanded.

In April 1979, Mt. Soufriere volcano erupted, forcing the evacuation of the northern agricultural two-thirds of St. Vincent Island for several months and seriously disrupting agriculture and the natural environment. The volcano's effects -- disturbance of soil, destruction of trees, etc. -- are still apparent.

Cultivation on the steep slopes, a practice that has been carried out for many decades on much of the St. Vincent island, presents a potentially serious problem with erosion and landslides. However, the accepted planting method in the island helps to reduce the hazard potential. The farmers seldom plant crops on sloping land without using the "ridge and furrow" method that follows the contour, a well known soil conservation practice. Nevertheless, soil erosion is a serious problem in some areas, and the potential for increased erosion is high. Sound soil conservation is essential to the future of the island's agriculture.

Freshwater and saltwater harvests are an important source of food for St. Vincentians. However, the local fish harvest does not meet the local demand. The yearly fish catch along the coastal waters in St. Vincent and the Grenadines is about 900 tons; the local demand is estimated at 1,200 tons. There presently is some effort to boost the fishing industry and aquaculture in the country.

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One of the country's cherished native birds -- the St. Vincent Parrot -- is endangered and protected by law. Wild populations reside in the mountains, and some are kept caged as pets. Although protected by law, the wild populations are still sought by poachers who capture and sell them.

PROJECT IMPACTS ON THE ENVIRONMENT AND MITIGATIVE MEASURES

The Project will not support any actions such as river basin development, new irrigation or water management programs, land leveling or clearing, drainage, large-scale agricultural mechanization, new lands development, resettlement, road building or improvement, power plants, industrial plants, or potable water or sewage programs that are generally recognized to have a significant impact on the environment. The Project's institutional building components -- strengthening agricultural training and extension, marketing associations, and commodity surveys -- will not include any environmental interventions. The training and extension activities promise to strengthen greatly St. Vincent's indigenous capacity in agricultural production and also in environmental protection. As discussed below under Pesticide Procedures, the Project will stimulate a variety of initiatives in pesticide training and pesticide management. Collectively, these initiatives will be an important step toward mitigating the present pesticide problem and preventing future problems.

Nevertheless, a major Project objective is to increase production in carrots, peanuts, and sweet potatoes grown for export which will involve environmental interventions. The primary objective of the Project's production component is to intensify and improve the present inputs -- varietal selection, fertilizers, pest management, crop rotation, mechanization, etc. -- required to produce these crops. In due course, the Project promises to increase the input of pesticides and fertilizers. Project activities will encompass about 300,245, and 200 hectares of carrots, peanuts, and sweet potatoes, respectively (target production figures by the end of the three-year Project).

This section examines those actions of the production component considered to have a potentially significant adverse impact on the human and natural environment and sets forth measures necessary to mitigate the adverse effects.

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A. Soil Erosion

As already discussed, steep-slope cultivation in St. Vincent presents a potentially significant problem. The steep-slope sites are potentially highly erodible and susceptible to landslides unless managed properly. The introduction of either herbicides or manual weed control techniques that totally denuded the slopes of the ground cover (grasses and broadleaf weeds and the underground root systems) and associated organic matter would greatly magnify the potential for serious soil erosion.

Mitigative Measures: The currently accepted planting practice -- ridge and furrow method following the contour -- is an important soil conservation practice and must be encouraged, particularly as more fields come under cultivation. Making new land available to farmers without ensuring that they use sound soil conservation practices will only contribute to the decline of St. Vincent's agricultural productivity in the long term. Education is therefore essential in ensuring against soil erosion.

Soil conservation techniques in addition to the ridge and furrow method following the contour should be explored and encouraged in the Project. These may include:

- * Intercropping and crop rotation schemes that reduce soil erosion
- * Minimum tillage systems that result in minimal disturbance of the soil and organic matter
- * Planting of ground cover crops of no commercial value
- * Identifying soils that are especially susceptible to erosion and taking steps to ensure against planting them in crops that require intensive cultivation.

B. Over-Fertilization

The Project -- through research and soil testing -- will attempt to identify the optimal fertilizer regimes for various crop and soil combinations in St. Vincent. Until the research and soil testing

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have been completed, the real need for fertilizers will not be known. It is certain, however, that the Project will result in increased use of fertilizers in carrots, peanuts, and sweet potatoes.

Nitrate contamination of ground water and rivers is a potential problem any time nitrogen fertilizers are used. Heavy nitrate concentrations can have serious human health implications. Use of fertilizers may result in other problems -- accumulation of toxic salts and eutrophication of surface water, for example. However, the use of fertilizers in the Project would not be expected to result in serious problems unless excessive rates were applied.

Mitigative Measures: Limiting the use of fertilizers to actual need following reliable soil testing is the best way to avoid problems. The training and extension programs in soil fertility and fertilizer use should emphasize to farmers and others the potential problems resulting from over-fertilization and encourage the correct and judicious use of fertilizers and other soil amendments.

C. Interference with Wildlife Resources

The forested land of St. Vincent's interior provides habitat for certain unique flora and fauna, including the St. Vincent parrot that is protected by law. These flora and fauna are an important part of St. Vincent's natural heritage as the rivers and surrounding sea are. Encroachment of agriculture into the natural ecosystems can endanger any number of plant and animal species by disrupting important food chains and by destroying essential shelter and breeding habitat.

Mitigative Measures: Project personnel should establish a dialogue with GOSV personnel working in forestry, fisheries, and environmental protection and enlist their cooperation in identifying and mitigating any threat to wildlife resources brought on by the Project.

D. Pesticide Abuse

Pesticides are currently used widely in St. Vincent, and the problems associated with their use are already worrisome as described by Vincentians Browne and Lewis (1980) (refer to

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Selected References at end of Assessment): "For the period 1977 to June 1980, six cases of death due to pesticide poisoning were reported. Five of these were suicide cases and occurred in the banana growing area of Marriagua. The other was accidental - a toddler ingested what appears to have been an organophosphorus compound. In September of 1979 it was reported that thousands of crayfish were crawling out of the Rabacca river and dying along its banks. Investigation revealed that Systoate had been dumped into the river.

Banana cultivation has been extended far into the mountains. Some farmers have cultivated in and around catchment areas, but several have been evicted by the water authority. Cultivation of bananas in such areas can lead to contamination of drinking water due to leaching of pesticides, especially when those with long-persistence are used.

In most areas of St. Vincent rivers, streams and springs are the principal sources of water used for the mixing of chemicals, thus the chance of contamination of the water is ever present. Yet no major mishap has so far occurred. In an effort to eradicate "Aedes aegypti" (mosquito), a programme of fogging using malation is being carried out. This is often done at rush hour periods, 8.00 a.m. - 9.00 a.m. and is causing some concern. Fortunately, only one case of intoxication has been reported."

Pesticide use represents the potentially most serious environmental hazard of all Project actions. If safeguards are not established at an early stage in the development of the Project, the use of pesticides will increase and so will the potential for pesticide-induced problems. Minimizing these problems will require the collaborative efforts of regulatory, educational, and research personnel as well as farmers. The Project can contribute significantly in reducing the existing pesticide problems and preventing the eruption of new ones.

Mitigative Measures: When pesticides are used in AID projects, a comprehensive risk/benefit assessment of their use is required and all appropriate mitigative procedures must be built into the projects. The entire section below, Pesticide Procedures, is devoted to this assessment, and the required mitigative measures are specified.

PESTICIDE PROCEDURES

To meet its objectives, the St. Vincent Agricultural Development Project must effectively deal with pest problems. Pesticides will be required in some instances.

When pesticides are to be used in AID projects, certain actions are required to ensure that their use does not present unreasonable hazards to the human population or the environment. This section describes use of pesticides in the Project and sets forth procedures that must be taken to minimize their adverse effects. The use of alternative nonchemical methods of control will be encouraged whenever practical. Regulation 16 of the Code of Federal Regulations on Pesticide Procedures (Paragraph 216.3(b)(1)(i) of Environmental Procedures) established the general guidelines used here.

In this document, the term "pest" includes any group of organisms -- insects, bacteria, viruses, weeds, nematodes, snails, slugs, birds, rodents, or others -- that adversely affects the production, preservation, or use of agricultural plants (including seeds and planting stock) or harvest products. "Pesticide" is any chemical preparation used to kill, repel, or otherwise stop the action of a pest population and would include the following:

- * Insecticide (to control insects)
- * Acaricide (to control mites)
- * Herbicide (to control weeds)
- * Fungicide (to control fungi--molds, etc.)
- * Nematicide (to control nematodes--small round worms)
- * Rodenticide (to control rodents).

Several factors may determine the kinds and quantities of pesticides required for use in the Project: the success in implementing the Project activities on schedule, the severity of the pest problems, the crops in question, the availability of control methods other than pesticides, economic resources of the farmers, etc. However, it is certain that some pesticides will be used by farmers in the commercial production of the primary crops -- carrots, peanuts, and sweet potatoes -- to be emphasized. Pesticides will also be used by Project personnel for experimental purposes. For later discussions, pesticide uses in the Project will

be treated in two categories:

*Supervised Use - use of pesticides restricted to research, limited field evaluation, or demonstration by or under the direct supervision of Project personnel

*General Use - use of pesticides by farmers not under the direct supervision of Project personnel.

A. The EPA Registration Status of the Requested Pesticides

In the United States of America (USA), pesticides are registered by the Environmental Protection Agency (EPA). The EPA registers a pesticide product in one of two categories: "restricted use" or "general use." A restricted use pesticide is available for purchase and use only by pesticide applicators who have been certified by law, because of its very high toxicity and/or environmental hazards. A general use pesticide, by contrast, is available for purchase and use by the general public.

Pesticides suggested for use in the St. Vincent Agricultural Development Project are shown in Table 1. All of these materials have been registered by EPA in the general use category (refer to section E. below for a discussion of the EPA regulatory status of the fungicide captan).

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Table 1: Pesticides Suggested for General or Supervised Use in the Crops Indicated in the St. Vincent Agricultural Development Project.

Common Name and (BRAND NAME)	EPA Registration Category	Use in Project	Crops to be Treated: 1)		
			Carrots	Peanuts	Sweet Potatoes
<u>Fungicides</u>					
Benomyl (BENLATE)	General	General	x	x	
Captan (CAPTAN)	General (RPAR)	General		x	
Mancozeb (DITHANE M45)	General	General	x	x	
<u>Herbicides</u>					
Alachlor (LASSO)	General	General		x	
Petroleum (kerosene, various names)	General	General	x		
<u>Insecticides</u>					
Acephate (ORTHENE)	General	General		x	
Carbaryl (SEVIN)	General	General	x	x	x
Diazinon (BASUDIN)	General	General	x	x	x
Malathion (MALATHION)	General	General	x	x	x
<u>Nematicides</u>					
Carbofuran (FURADAN 5G)	General	Supervised	x 2)		
Carbofuran (FURADAN 10G)	General	Supervised	x 2)		
<u>Rodenticides 3)</u>					
Brodifacoum (RATAK, KLERAT)	General	General		x	x
Warfarin (various names)	General	General		x	x

- 1) Residue tolerances have been established by EPA for all uses indicated unless noted differently.
- 2) Residue tolerances have not been established by EPA but have been recommended by FAO/WHO.
- 3) The rodenticides (rat baits) are to be placed around the crop fields. They should not contact the crop plants or harvest products.

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In the Project, the pesticides are to be used in one of two ways -- General Use or Supervised Use -- as noted in Table 1. Pesticides in the General Use category (use by farmers not under the direct supervision of Project personnel) would not be expected to present an unreasonable hazard to humans or the environment if used according to their labels and applied only to the crops indicated in Table 1.

Carbofuran (FURADAN 5G and FURADAN 10G) is considered to be too toxic for General Use in St. Vincent. The farmers generally are not properly prepared at present to use the material in a safe manner. It should be used only under supervised conditions. Farmers who have been properly trained on the hazards, correct use, and safe disposal of pesticides, or who apply the pesticides under the supervision of Project personnel, would qualify to use carbofuran as a nematicide in carrots. In such instances, Project personnel will ensure that the farmers are provided with, and showed how to use correctly, safety devices and protective clothing, gloves, and boots to protect against pesticide exposure.

Pesticides in addition to those shown in Table 1 can be used for research or limited field evaluation purposes. Uses of pesticides for research or limited field evaluation purposes by or under the supervision of Project personnel are exempt from AID's pesticide procedures. In such instances, however, AID will ensure that the manufacturers of the pesticides provide toxicological and environmental data necessary to safeguard the health of the Project personnel and the quality of the local environment in which the pesticides will be used. Further, treated crops will not be used for human or livestock consumption unless appropriate tolerances have been established by EPA or recommended by the United Nations agencies, the Food and Agriculture Organization (FAO) and World Health Organization (WHO), and the rates and frequency of application, together with the prescribed preharvest intervals, do not result in residues exceeding the tolerances. This prohibition does not apply to the feeding of treated crops to animals for research purposes.

Project personnel should examine the list of pesticides in Table 1 and determine if additional pesticides may be required. If the Project personnel determine a need for pesticide materials not in Table 1 they should notify AID's Regional Development Office, Bridgetown, Barbados, of the additional needs.

B. The Basis for Selection of the Requested Pesticides

Availability of and experience with the materials in St. Vincent, efficacy, human safety, and the acceptability of residue tolerances were the criteria used in selecting the pesticides being suggested for use in the Project. All of the pesticides are already being used in St. Vincent.

According to GOSV personnel, the small farmers and farm workers in St. Vincent are often not properly prepared to handle highly toxic pesticides. The farmers and workers may be unaware of the hazards of the pesticides. Sometimes they use the materials from unlabeled containers. Often, they do not possess (or use) protective clothing or safety devices, and they carelessly handle the materials (washing out the empty containers in rivers, etc.). Further, there is no poison control center, and the medical personnel are generally not qualified to diagnose and treat cases of pesticide poisoning. Because of these reasons, pesticides with high toxicity or prolonged persistency are unsafe for most of St. Vincent's farmers, and are not being suggested for General Use in the Project.

Although paraquat (GRAMOXONE) is widely used in St. Vincent as a weed control, it presents very high risks to humans. One swallow can kill, and it is harmful to the eyes and skin. Breathing the spray mist can cause serious lung damage. The risks of serious harm and even death from paraquat and other highly toxic pesticides are greatly increased when the materials are dispensed from hand-or back-carried knapsack sprayers such as commonly used in St. Vincent. Paraquat and other highly toxic materials that are normally dispensed from hand-or back-carried knapsack sprayers are not suggested for General Use in the Project.

C. The Extent to which the Proposed Pesticide Use is Part of an Integrated Pest Management Program

Reliance on pesticides alone is expensive, and heavy use of pesticides rarely gives lasting control. Pests -- especially insects, mites, plant disease agents, and rodents (rats) -- often become genetically resistant to pesticides if these materials are used extensively. The development of resistant strains of pests may have very serious consequences for the farmer. Previously effective pesticides will no longer control the pests. Thus,

without suitable alternatives to combat the genetically resistant organisms the farmers may experience heavy crop losses or even complete crop failures. Pest resistance to pesticides has been reported in several Caribbean countries including St. Vincent. Its onset and spread in the pest populations are most likely to occur in areas where pesticides are used heavily.

Experience in many parts of the world has shown that the best way to avoid pest resistance and also to increase and sustain agricultural production is to spread the burden of crop protection over a variety of control methods -- biological, genetic, physical, and chemical -- integrated together on the basis of economic and environmental criteria. This approach is known as "integrated pest management" or IPM. The general steps to IPM are as follows:

- * Use a pest control method only when there is evidence that its benefits outweigh its costs
- * Do everything possible to prevent the pests from reaching damaging levels by using nonchemical methods such as:
 - resistant or tolerant crops
 - biological control (natural enemies)
 - cultural control such as crop rotation, fertilizer management, tillage, altered harvest practices, etc.
- * Regularly inspect the crops and apply pesticides on the basis of real need.

In integrated pest management, pesticides are applied only when the pests have attained or exceeded what is known as the "economic threshold". The economic threshold may be expressed in different ways, for example:

- * Numbers of insect larvae per plant
- * Percentage of fruit damaged by a given pest
- * Numbers of pests per square meter, etc.

The economic threshold is essentially the "break even point" in crop protection. When a pest infestation is below the economic threshold level, the cost of applying the pesticide exceeds the losses caused by the pest. Above this level, control becomes profitable.

The economic threshold recommended to farmers must be based on research and field trial. However, experienced agricultural officers, familiar with the characteristics of plant growth and development and pest dynamics, can often establish preliminary, crude threshold levels. The preliminary economic thresholds can be tested out on a small scale under actual farming conditions and refined as more information becomes available. By inspecting the farmers' fields regularly and applying pesticides around economic threshold levels, pesticide use can often be reduced significantly without a sacrifice in crop yield or quality.

Some research related to IPM has been conducted in St. Vincent, mainly by the Caribbean Agricultural Research and Development Institute (CARDI), and has included:

- * Identifying native and exotic natural enemies (insect parasites and predators) for use against pest organisms
- * Devising crop rotation schemes for control of nematodes affecting carrots
- * Optimizing use of pesticides.

Further, many Vincentian farmers already use a variety of traditional pest control methods (hand picking insects, field sanitation, etc.) that can be effective in IPM programs. However, IPM strategies have not been developed for all of the pests affecting any one of the crops to be emphasized in the Project. Their development would require a major effort in research and field evaluation.

The Project will stimulate some research and training in IPM development and pesticide management (an important aspect of IPM). Field research will include: a search for insect and disease resistant varieties of carrots, peanuts, and sweet potatoes; rotation schemes that disrupt pests affecting these crops; pesticide application techniques that protect natural enemies; and certain other aspects of IPM. Training, described below under K., will familiarize extension officers and research workers with the IPM principles and techniques and stress the importance of using pesticides judiciously, based on actual need.

D. The Proposed Method or Methods of Application, Including Availability of Appropriate Application and Safety Equipment

The hand-operated hydraulic knapsack sprayer is popular in

St. Vincent among small farmers typical of those who will participate in the Project. Most foliar treatments of pesticides (applications to the plants' leaves) are made with knapsack sprayers. Granular pesticides are generally broadcast or dropped on specific areas. In the Project, pesticides will be applied mostly by knapsack sprayers and the other hand-operated techniques presently used by St. Vincent farmers.

The Project will provide and enforce the use of all appropriate protective devices and apparel (face masks, gloves, boots, and clothes) required to protect the applicators and field workers. It will be the responsibility of the GOSV-designated Pesticide Coordinator described in J. below to ensure that the pesticides are transported, stored, mixed, loaded, applied, restored, and disposed of properly, as specified on the pesticides' labels. The Pesticide Coordinator should enforce all recommendations and warnings on the labels, including those concerning first-aid precautions, rates and frequencies of application, time of re-entry into treated fields, and how many days before harvest the pesticides may be applied.

The pesticides should be stored in their original containers in a specific room, shed, or area having a locked entry with keys assigned only to authorized individuals. A sign reading "DANGER, PESTICIDE STORAGE AREA" should be erected. Pesticides should never be stored near food, animal feed, animals, or drinking water. The storage place should be in an area protected from tropical storms and fire hazards.

Proper disposal of excess or waste pesticides or pesticide containers is very important. EMPTY CONTAINERS SHOULD NEVER BE REUSED--THERE IS NO PRACTICAL METHOD FOR REMOVING THE TOXIC PESTICIDE RESIDUES!

Liquid containers should be treated as follows: Empty the container's content into the spray tank; drain in vertical position 30 seconds. Refill container 1/4 - 1/5 full, rinse thoroughly, pour into tank, drain. Repeat rinsing and draining three times. Use the rinse water in the sprayer. Punch several large holes in the container's bottom. Crush the container and bury in a designated land disposal site on high ground away from water.

The containers and small quantities of left over pesticides should be buried in pits in the soil about 0.5 meter deep. The bottoms and sides of the pits should be lined with lime, calcium carbonate, carbon or charcoal, if available, or leaves, tree bark, or other plant matter if not available. Any of these materials is a good absorbent. The pits should be refilled to ground level with soil.

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Empty paper containers and bags should also be buried in the pits.

The AID-funded Consortium for International Crop Protection (CICP), Berkeley, California (USA) and its collaborators have produced a series of publications on pesticide safety and management that apply to conditions similar to those in St. Vincent. CICP will provide copies of these publications to AID's Regional Development Office in Barbados, and this office, in turn, will make the publications available to Project personnel.

The Project will initiate several new training programs in pesticide safety and management for agricultural extension workers and the farmers themselves (refer K. below for a discussion of this training).

E. Any Acute and Long-Term Toxicological Hazards, Either Human or Environmental, Associated with the Proposed Uses of Pesticides and Measures Available to Mitigate the Hazards

All pesticides are potentially hazardous to humans and the environment and should be treated with great caution regardless of their relative toxicities. A summary of the most relevant toxicities and special hazards of the pesticides is presented in Table 2. Additional information will be found on the label. READ THE ENTIRE LABEL, AND USE EACH PRODUCT STRICTLY IN ACCORDANCE WITH THE PRECAUTIONARY STATEMENTS AND DIRECTIONS.

The potential health hazard of a pesticide depends upon its toxicity and the amount swallowed, absorbed, or inhaled. The relative toxicity of a pesticide can be found by examining its:

- * LD₅₀ value = the amount of pesticide toxicant necessary to kill 50 percent of the test animal population (usually laboratory rats). It is expressed in weight of the pesticide per unit of body (milligrams/kilogram) when swallowed (Oral LD₅₀) or absorbed through the skin (Dermal LD₅₀). The LD₅₀ values of fumigants (gaseous poisons) are expressed in parts per million.

As a general rule, the pesticides with the lowest LD₅₀ values are potentially the most toxic to humans. For example, ingestion of just a few drops to a teaspoonful of a pesticide with an Oral LD₅₀ value of less than 50 might be sufficient to kill an adult person. The same person would probably have to ingest 16 tablespoonfuls or a pound or more of a pesticide with an Oral LD₅₀ of 5,000 before

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death resulted.

There are exceptions. For example the rodenticides (rat poisons) suggested for use in the Project have very low Oral LD₅₀ values, but they are considered to be only slightly toxic to humans.

The World Health Organization has classified pesticide products into four categories of toxicity, based on the LD₅₀ values:

- Ia - Extremely hazardous
- Ib - Highly hazardous
- II - Moderately hazardous
- III - Slightly hazardous.

Nearly all pesticide safety experts agree that pesticides in WHO's first two categories -- Ia -- Extremely hazardous and Ib - Highly hazardous -- are too toxic for general use. They are dangerous chemicals that should only be used by specially trained people and taking full account of the precautions indicated on the labels of pesticide containers.

Table 2: Toxicity and Special Environmental Hazards of Pesticides suggested for Use in the St. Vincent Agricultural Development Project.

Common Name and (BRAND NAME)	Acute ¹⁾ Oral LD ₅₀	WHO Category	Special Environmental Hazards
<u>Fungicides</u>			
Benomyl (BENLATE)	>10,000	III	Toxic to fish
Captan (CAPTAN)	9,000	III	
Mancozeb (DITHANE M45)	>8,000	III	
<u>Herbicides</u>			
Alachlor (LASSO)	1,800	III	
Petroleum (Kerosene, various names)	-----	-----	
<u>Insecticides</u>			
Acephate (ORTHENE)	866-945	II	Hazardous to bees; do not contaminate water
Carbaryl (SEVIN)	500-850	II	
Diazinon (BASUDIN)	300-400	II	Hazardous to bees; do not contaminate water Toxic to fish, birds, and other wildlife and hazardous to bees
Malathion (MALATHION)	1,375	II	
<u>Nematicides</u>			
Carbofuran (FURADAN 5G)	11	IB	Toxic to fish, birds, and other wildlife
Carbofuran (FURADAN 10G)	11	IB	
<u>Rodenticides</u>			
Broadifacoum (RATAK, KLERAT)	0.26	-----	Hazardous to wild other than target rodents
Warfarin (various names)	3	-----	

1) LD₅₀ shown is based on toxicity of the active ingredient (technical material) and not the toxicity of the formulated product. LD₅₀ values of the technical materials may be considerably higher.

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Table 2 shows the WHO category of toxicity for each pesticide suggested for use in the Project. Carbofuran (5 and 10 percent granular formulations of FURADAN) is the only pesticide suggested for use in the Project that falls in one of WHO's first two categories -- both formulations are in the Highly hazardous (Ib) Category. Because of its high toxicity and potential hazards to the applicators, carbofuran is not suggested for General Use by unsupervised applicators who have not been properly trained.

It should be noted that all of the fungicides -- benomyl (BENLATE), captan (CAPTAN), and mancozeb (DITHANE M45) -- being suggested for use in the Project have recently undergone intensive study in the United States concerning their risks to human health. All of the fungicides are used widely in the USA and also in the Caribbean.

Benomyl came under scrutiny by the Environmental Protection Agency in 1977 when the chemical and the material it metabolizes, called MCB, were accused of causing birth defects and genetic damage. The EPA recently completed its study on this fungicide. The study showed that the fungicide can cause tumors in laboratory animals, but it failed to show direct evidence that the material causes birth defects.

The EPA now specifies that anyone who mixes or loads benomyl must wear a respirator as a way of minimizing the risks of inhalation, the primary route of risky exposure. The agency does not consider the risks from skin (dermal) exposure to be a serious problem if the material is used correctly.

The health effects of the fungicide captan are still being studied by the EPA, and the agency has issued a so-called "Rebuttable Presumption Against Registration", or RPAR, against this material. The RPAR process is designed to gather information and stimulate public debate about the problems associated with a pesticide. If at the end of this process the risks are found to outweigh the benefits of the pesticide, the pesticide may be cancelled in the USA -- that is, it may be legally banned. Captan has been accused of causing tumors and genetic change. However, until the RPAR process is completed, no actions will be taken.

The health effects of mancozeb have been scrutinized for possible effects in causing tumors and birth deformities. The results have been inconclusive. The EPA therefore has not restricted or limited the use of the fungicide on the crops for which registered. However, registrants of the material have had to add a statement to the label specifying that protective clothing (long trousers, long-sleeve shirt, impermeable gloves, hat,

and boots) should be worn during mixing and loading.

It will be the responsibility of the Pesticide Coordinator to inform the farmers, extension officers, and others who use pesticides in the Project of these potential hazards and to ensure that all appropriate measures -- specified on the labels and in section D. above -- are taken to mitigate the hazards.

F. The Effectiveness of the Requested Pesticides for the Proposed Uses

Pesticides suggested for use in the Project (Table 1) have been evaluated and found to be effective in St. Vincent or other Caribbean countries.

No cost effective alternative to paraquat (GRAMOXONE) can be identified. This herbicide is now used in St. Vincent as a preplant weed control in carrots, peanuts, and sweet potatoes, but it is not recommended for use in this Project (see Section B.).

A partially effective alternative to paraquat is the herbicide glyphosate (ROUNDUP). Use of glyphosate would greatly reduce the applicator hazards. It could be used as a substitute for paraquat, at least during the dry season when it works best, but it is considerably more expensive. Research in the Cook Islands (South Pacific) has shown that by mixing the common fertilizer urea with glyphosate, the herbicide can be applied at greatly reduced rates--and therefore at greatly reduced costs--and still give effective control. The Project will allow an opportunity to begin a modest program in research and technical assistance to test this approach in St. Vincent and to seek other cost effective alternatives to paraquat and other pesticides that present unreasonable risks.

G. Compatibility of the Proposed Pesticides with Target and Non-Target Ecosystems

The pesticides suggested for use in the Project (Table 1) are generally non-persistent and, if used correctly and according to their labels, should present no unusual hazards to the target or the natural ecosystems. Incorrect handling, such as applying higher doses and at closer intervals than recommended on the labels, careless spraying during windy conditions, careless storage, improper disposal, or rinsing the equipment and containers in rivers,

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would have harmful effects.

Most of the insecticides suggested are toxic to natural enemies (beneficial predatory and parasitic insects, for example), especially when applied at high rates, and some are hazardous to bees. Their use therefore would be expected to reduce populations of natural enemies and bees that resided in the treated crop fields.

The threat of the build-up of genetically resistant strains of insect pests, plant disease organisms, and rats that cannot be controlled with pesticides that were previously effective always exist.

Some of these problems are unavoidable when chemical pesticides are used. The best way to minimize the adverse effects is to use the pesticides judiciously in combination with other control methods in IPM programs and to educate the farmers and other applicators of pesticides of the hazards and proper use of the materials. The Project will emphasize IPM and pesticide management, and education is the central theme of pesticide use in the Project.

H. The Conditions under which the Pesticides are to be Used, Including Climate, Flora, Fauna, Geography, Hydrology, and Soils

These conditions were described above in the section entitled The Environmental Setting.

I. The Availability and Effectiveness of Other Pesticides or Non-Chemical Control Methods

Most of the pesticides suggested for use in the Project, and many others as well, are available in St. Vincent through the Ministry of Trade and Agriculture, Banana Growers Association, or private firms. As discussed above under C., there has been some effort to develop non-chemical methods. Crop rotation is especially effective for reducing nematode problems in carrots. Crop rotation, the use of clean, pest-free planting material, destruction of diseased crop plants, crop residue destruction, and many other cultural practices reduce pest severity. However, with the availability of pesticide technology, these practices have been de-emphasised. MTA and CARDI are attempting to re-introduce these practices. Further, a national committee has recently been formed to encourage comprehensive approaches to the control of rats--serious pests of agriculture and a public health problem.

Sanitation, control with cats, and other nonchemical control methods are being encouraged.

In St. Vincent and other countries in the Caribbean, only rarely have pest control methods been evaluated in terms of the relative costs of the level of control achieved and the costs of the control method itself. Information derived from acceptable cost-benefit analyses is very limited. Therefore, conclusions concerning the cost effectiveness of the pesticides being recommended in relation to various alternative pesticides or nonchemical control methods cannot be reached with any degree or certainty.

The Project will support research on the use of cultural practices and other nonchemical methods that are known to be effective against pests. It will also support research aimed at securing cost-benefit information on pesticides and the alternative methods.

J. St. Vincent's Ability to Regulate or Control the Distribution, Storage, Use, and Disposal of the Requested Pesticides

The Pesticide Control Act of 1973 provides for the control of the importation, sale, storage, and use of pesticides. It empowered the Governor General to develop pesticide regulations and enforcement procedures. The Act also provided for the establishment of a Pesticide Control Board to advise the Governor General on pesticide matters and to enforce the pesticide regulations. However, the Board has yet to be established, and the regulations have not been developed or enforced. Therefore, the country is not presently able to regulate or control effectively the distribution, storage, use, and disposal of pesticides.

The Project affords an opportunity to stimulate formation of the Pesticide Control Board specified in the 1973 Act, develop pesticide regulations, and to enforce the regulations. The Project will provide funds for the employment of two inspectors/trainers to assist in implementing the Act. In addition, the GOSV shall designate one person as Pesticide Coordinator to coordinate the implementation of the initiatives in pesticide monitoring, training, and research specified in sections A. through L. of the Pesticide Procedures. The GOSV Pesticide Coordinator shall draw from expertise and technical assistance in health, agriculture, forestry, fisheries, and other disciplines as required to implement program that safeguard against unsound environmental practices, to insure the safe and legal use of pesticides, and to seek integrated pest management approaches. Project funds will be allocated for carrying

out this work and also for purchasing safety devices and protective apparel required to ensure safe handling of pesticides and other agricultural chemicals.

In addition, the Project will sponsor in-country training (see K. below) for extension officers, health officers, nurses and other medical personnel, pesticide applicators, and others on pesticide management, including pesticide safety, monitoring, disposal, etc.

It will be the responsibility of the Pesticide Coordinator to ensure correct distribution, storage, use, and disposal of pesticides used in the Project, as specified in Section D. above.

K. The Provisions Made for Training of Users and Applicators of Pesticides

The use of pesticides is routinely addressed in extension programs of the MTA. Agricultural extension officers advise farmers on appropriate pest control measures to use. The Crop Protection Unit of MTA collaborates in carrying out various pest diagnostic services, training programs, and pest control operations. This Unit currently consists of a leader (Sylvester Lynch is the acting leader) and a spray team composed of 5 or 6 laborers. The leader has a general agricultural background with limited formal training in crop protection. He advises the extension workers and farmers on the use of pesticides and alternative methods of control, conducts seminars on pesticide use and crop protection, and coordinates the spray team's activities. The spray team uses pesticides to marshall attacks on threatening insect pests and plant diseases that farmers may not be able to control effectively themselves.

Each year in each extension district at least one seminar on pesticide use and safety is featured at farmers' seminars conducted by MTA. Similar seminars are held for banana farmers by the Banana Growers Association.

Training in pesticide management and integrated pest management for agricultural extension and research officers and health officers will commence during the first year of the Project and be a continuing activity. One, one-week course will be conducted during each of the three years of the Project. The courses will be carried out by MTA with technical assistance from the Consortium for International Crop Protection. The courses will emphasize practical aspects of pesticide safety (proper storage, application, and disposal of pesticides) and use of simple nonchemical control techniques that may be available and less costly than pesticides.

Health officers, nurses, and medical personnel will be instructed on procedures for recognizing symptoms of pesticide poisoning and administering the appropriate treatments. Project funds will be made available to carry out this training.

Farming training and public awareness programs on the correct and safe use of pesticides will be a continuing activity of the Project. Project funds will be made available for support of these activities. The MTA, in cooperation with the AID-financed Caribbean Agricultural Extension Project, should consider the development of a pesticide users "certification program," certifying farmers and others who have been trained and demonstrated their proficiency in safe pesticide use.

L. The provisions Made for Monitoring the Use and Effectiveness of the Pesticides

The GOSV-designated Pesticide Coordinator (refer to J. above) will monitor the use of pesticides in the Project and ensure that they are being handled correctly and safely as specified in Section D. above. The Pesticide Coordinator will also collaborate with research and extension officers and participating farmers to determine if the pesticides are giving effective control.

Some of the pesticides now being used on carrots, peanuts, and sweet potatoes in St. Vincent have never been registered in their countries of origin (USA, Canada, England, or Western European countries) for uses on those crops, and residue tolerances have not been established for them. A residue tolerance is the amount (expressed in parts per million) of pesticide that may legally and safely remain in or on any raw farm product to be eaten by livestock or humans. Many countries will not allow the importation of crop produce used for human food if the residue tolerances are violated. Therefore, the use of some pesticides on St. Vincent crops grown for export may have serious implications if residue tolerances have not been established for these pesticide/crop combinations. The deposit of illegal residues on the harvested products may greatly limit the options for export. The Pesticide Coordinator will ensure that the residue tolerance requirements are not violated in the Project.

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PERSONS CONSULTED IN ST. VINCENT FOR INFORMATION RELATIVE TO
ENVIRONMENTAL ASSESSMENT

Jethro T. Greene	Chairman, Organisation for Rural Development, Kingstown
Kenneth D. Bonadie	Agricultural Officer (Extension), Ministry of Trade and Agriculture, Kingstown
N.C. Raninga	Veterinarian, Ministry of Trade and Agriculture, Kingstown
Kenneth L. Wright	Peace Corps Volunteer, Organisation for Rural Development, Kingstown
K. Morris	Agricultural Officer (Fisheries), Ministry of Trade and Agriculture, Kingstown
Sylvester Lynch	Crop Protection Unit, Ministry of Trade and Agriculture, Kingstown
Charles Gunsam	Agricultural Officer (Research), Ministry of Trade and Agriculture, Kingstown
C. Smith	Field Worker, Organisation for Rural Development and farmer, Belmont
Mr. Byan	Farmer, Belmont.

SELECTED REFERENCES

- * Brown, Glenroy, and Lewis, J. 1980. Pest and Pesticide Management, St. Vincent, pages 170-177. In: E.G.B. Gooding (Editor), Pest and Pesticide Management in the Caribbean. Proceedings of Seminar and Workshop, 3-7 November 1980, Bridgetown, Barbados. Volume III. Country Papers, Consortium for International Crop Protection/United States Agency for International Development.

- * MUCIA. 1982. St. Vincent and the Grenadines Agriculture Sector Assessment. Midwest Universities' Consortium for International Activities, Inc. December. TSM 41a. 114 pages.

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