ST. VINCENT AND THE GRENADINES AGRICULTURE SECTOR ASSESSMENT

MIDWEST UNIVERSITIES' CONSORTIUM FOR
INTERNATIONAL ACTIVITIES, INC.

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ACRONYMS

USAID	United States Agency for International Development
AMP	Agricultural Marketing Protocol
BDD	British Development Division in the Caribbean
BGA	Banana Growers Association
CARDATS	Caribbean Regional Rural Development Advisory and Training Service
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Common Market
CATCO	Caribbean Agricultural Trading Company
CDB	Caribbean Development Bank
CPU	Central Planning Unit
EC$	East Caribbean Dollar
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GNP	Gross National Product
GOSV	Government of St. Vincent and the Grenadines
IBRD	International Bank for Reconstruction and Development
IMF	International Monetary Fund
KM^2	Kilometer Square
MTA	Ministry of Trade and Agriculture
ORD	Organization for Rural Development
SNAP	St. Vincent National Agriculture Plan
UNDP	United Nations Development Program
US$	United States Dollar
USA	United States of America
UK	United Kingdom
WINBAN	Windward Islands Banana Growers Associations

PREFACE

With the initiation of U.S. bilateral agricultural assistance to St. Vincent and the Grenadines, USAID requested a review of the agriculture sector be done to establish the basis for design of priority project activities most appropriate for USAID assistance. The framework used to accomplish this was:

1. A description of the agricultural sector;
2. an analysis of the primary constraints to agriculture development;
3. an identification of alternative actions to alleviate these constraints; and
4. a design of an agriculture program for USAID assistance.

USAID/Barbados requested that the Midwest Universities Consortium for International Activities furnish a team to accomplish these tasks. It was decided that the effort should be divided into two phases. By the end of Phase I, the team was to have completed:

1. a description of the agriculture sector;
2. a discernment and discussion of agricultural development objectives, strategies, and policies; and
3. an analysis of the primary constraints to agricultural development.

A draft report for Phase I was completed by September 15, 1982.

In Phase II, the following was accomplished:

1. revision of Phase I draft report to include comments of persons from St. Vincent;
2. identification of alternative actions to alleviate constraints; and
3. design of an agriculture program strategy for USAID assistance.

The team for Phase I activities which were conducted from August 30 - September 16, 1982 was:

Trevor Arscott - Agronomist
Corrine Glesne - Rural Social Scientist
Earl Swanson - Agricultural Economist
Earl Kellogg - Agricultural Economist and team leader

The team for Phase II activities which were conducted from November 3-18, 1982 was:

Frederick Fliegel - Rural Sociologist
Corrine Glesne - Rural Social Scientist
M. E. Sarhan - Agricultural Economist
Earl D. Kellogg - Agricultural Economist and team leader

The methodology used to accomplish the tasks involved personal interviews, review of literature, and discussions with a committee appointed by the Minister of Trade and Agriculture. The names and affiliations of persons interviewed are given in Appendix I. Persons interviewed consisted of private agribusiness people, farmers, government officials, AID agency personnel, and private agricultural group personnel. Appendix II includes the membership of the Committee appointed by the Minister.

This report reflects the teams' perceptions of what we heard and saw together with our judgment and analysis of the situation. Lack of time and appropriate data limited our ability to develop firm conclusions in all instances.

The members of the agriculture sector assessment team appreciated the time taken by many in St. Vincent to work with us. We sincerely hope this report will be useful to them.

USAID Agriculture Sector Assessment Team

November 18, 1982

EXECUTIVE SUMMARY

This report attempts to describe the agricultural sector of St. Vincent and the Grenadines, analyze major constraints affecting the sector, suggest some actions to lessen these constraints, and recommend a program for USAID assistance to alleviate some key constraints.

Vincentian agriculture is favored by some good soils, a climate which permits year-around production, and a capable work force. A diverse array of commodities is produced for both local consumption and export. The agricultural sector is also served by a number of public and private support systems. Total agricultural production is inevitably small in the context of the regional and extra-regional food system, however, because of the modest land base. Because of the open nature of the import and export sectors and natural conditions, a high degree of uncertainty for both producers and marketers exists as the agricultural sector attempts to adjust to the dynamics of the larger and highly competitive food system.

Constraints and alternative actions to alleviate them are identified in this report and focus on marketing problems, means of improving productivity to permit the small farmer to compete more effectively in an increasingly complex market, and the provision of improved program planning, implementation and monitoring capacity through increasing training and provision of accurate, up-to-date information. These actions should enhance the ability of the agricultural sector to: adapt quickly to changing conditions; improve net returns to the small farmer; and contribute more effectively to national objectives of employment generation, foreign exchange provision, and economic growth.

The strategy proposed for consideration by Government of St. Vincent and the Grenadines and by USAID for possible implementation is an integrated

commodity focused strategy, oriented to improved marketing, increased productivity, and enhanced program management for a few selected commodities.

It is proposed that some small number (2 to 4) of commodities with considerable market potential be identified. With a focus on these commodities, then, it is proposed that efforts be directed toward: implementing efforts to better predict market quantities; improving product quality by establishing appropriate classifications and provision of improved packaging materials; reducing loss for perishables with better storage; and improving marketing information for farmers and marketers. Strengthening of export market development is also recommended.

It is also proposed that improved productivity, for the selected commodities can be achieved by: seeking out superior varieties for improved yield and quality characteristics and testing them for local adaptability; designing a package of improved technologies and practices that fit existing farming systems; and providing extension and subsequently farmer training on ways to improve productivity and quality.

It is also proposed that a strengthened analytic capability be institutionalized in the Ministry of Trade and Agriculture. The objective here is to facilitate program planning, implementation, and monitoring. That objective is to be achieved by providing current information of both a census and special studies nature (e.g., on markets), and by providing training in both program planning and data utilization. Long-term training is also proposed for persons in marketing, applied research and survey study methodology. Additionally, improved physcial facilities for MTA personnel are identified as important aspects to consider in an assistance program in agriculture.

I. GENERAL SETTING AND DESCRIPTION OF AGRICULTURE SECTOR

St. Vincent and the Grenadines, located from about 13^{o} to 13^{o} 22' latitude and 61^{o} 10' longitude, is a collection of windward islands in the Eastern Caribbean. The total population is about 114,000 (mid 1982 estimate) with an annual growth of 2.1 percent.[1] The population is concentrated along the coast lines with steep terrain characterizing the interior of the islands. The area of the nation is about 388 km^2 while the arable land is approximately only 200 km^2. This results in an overall population density of 282 persons per km^2 and an arable land population density of 535 persons per km^2. The literacy rate for adults is estimated to be 82 percent with 90 percent of the primary aged children enrolled in school.

A. MACROECONOMIC CHARACTERISTICS AND PERFORMANCE

The agriculture sector accounted for about 13.8 percent of the GDP in 1981 which is a decline from the 17.3 percent average contribution from 1975-1977 (see Table I). The administration, manufacturing, and transport and communication sectors all account for slighly larger contributions to the GDP. The economy is heavily trade oriented with exports and imports being 77.3 and 106.9 percent respectively of the GNP at market prices. Agriculture accounts for about 50 percent of the domestic merchandise exports while food, beverages and tobacco are 34 percent of the value of imports (see Table II). The value of banana exports is 40 percent of the total domestic merchandise exports while four other agricultural commodities (arrowroot, coconuts, sweet potatoes, and nutmeg) account for most of the additional 10 percent of the total domestic merchandise export value. Data on recent labor force participation in the agriculture sector is not available from reliable sources, but a significant percent of the labor force spends substantial time working in agriculture. Foreign aid and private transfers historically have permitted consumption expenditure to exceed GDP,

TABLE I

ST. VINCENT AND THE GRENADINES SECTORAL ORIGIN OF GROSS DOMESTIC PRODUCT AT CONSTANT FACTOR COST, 1975 - 1981

	1975	1976	1977	1978	1979	1980	Est. 1981
				(in percent)			
Agriculture	16.5	19.7	15.6	16.1	12.2	10.9	13.8
Construction	14.5	10.8	12.4	10.7	11.7	11.9	11.7
Manufacturing	6.6	6.2	7.1	10.2	11.6	13.6	14.4
Electricity & Water	3.0	3.0	3.3	3.0	3.7	3.7	3.4
Transport & Communication	12.9	13.8	14.8	16.5	15.5	15.3	13.9
Wholesale & Retail Trade	12.6	13.5	13.3	11.4	11.3	11.2	10.4
Hotels & Restaurants	1.6	1.5	1.8	1.9	2.1	2.5	2.2
Banking, Finance, Real Estate and Business Service	9.0	8.5	7.8	8.7	8.9	9.4	8.0
Public Administration	19.5	19.3	20.4	18.4	19.5	18.1	13.9
Other Services	3.4	3.4	3.3	3.0	3.2	3.2	2.9
GROSS DOMESTIC PRODUCT AT FACTOR COST (Millions of 1976 EC$)	66.7	71.0	73.5	84.3	83.8	84.7	92.5

Derived from the Economic Memorandum on St. Vincent and the Grenadines - World Bank Report No. 3817 CRG, April 20, 1982, p. 134.

TABLE II

ST. VINCENT AND THE GRENADINES BALANCE OF PAYMENTS 1976 - 1981

	1976	1977	1978	1979	1980	Est. 1981
	(US$ Million)					
EXPORT OF GOODS AND NFS	16.2	16.9	30.9	40.0	45.6	50.2
Merchandise Exports	10.4	10.7	18.1	18.9	19.7	24.4
Non-Factor Services	5.8	6.2	12.8	21.1	25.9	25.8
IMPORT OF GOODS AND NFS	25.6	31.8	38.7	54.7	63.1	65.4
Merchandise Imports	23.7	30.3	36.2	46.4	57.2	58.5
Consumer goods	16.3	19.3	24.3	29.6	34.3	-
Intermediate goods	5.1	6.5	6.8	9.7	14.7	-
Capital goods	2.3	4.5	5.1	7.0	8.2	-
Non-Factor Services	1.9	1.5	3.5	8.3	5.9	6.9
RESOURCE BALANCE	-9.4	-14.9	-8.8	-14.7	-17.5	-15.2
CURRENT ACCOUNT BALANCE	-1.5	-6.4	-	-7.3	-9.4	-7.0

Derived from the Economic Memorandum on St. Vincent and the Grenadines: - World Bank Report No. 3817 - CRG, April 20, 1982, pp. 137-138.

resulting in negative gross domestic savings. Gross domestic investment is relatively high (25% of GNP) with central government capital formation accounting for about half.

The annual current account balance deficit is about 14 percent of the export value and has not changed significantly in the past five years. Foreign aid flows covered about 75 percent of the cumulative current account deficit from 1977-1981. While the outstanding external debt stood at 23 percent of GDP at the end of 1980-1981, the debt service ratio remained low at 1 1/2 percent of GDP as a result of the highly concessionary terms of outstanding loans.

The per capita GNP was US$539 in 1980. This relatively low per capita income indicates food demand will probably continue to increase substantially with increases in income. This will be especially true for animal and fishery products as well as food processing services. In terms of recent performance, the economy of St. Vincent recovered strongly in 1981 from the volcano eruption and hurricane of the two previous years. Real GDP at factor cost rose by an estimated nine percent in 1981. Value added in agriculture also increased substantially - 40 percent from the two previous years. St. Vincent continues to attract light industries in clothing, milling and feed mixing, container assembly and other assembly products. Manufacturing output rose by an estimated 18 percent in 1981. The rate of unemployment is thought to have declined further from the previous rate of 20 percent. The rate of inflation declined to about 12 percent in 1981 from about 18 percent in 1979-1980. Much of this lower inflation rate could be attributed to declining inflation rates of trading partners for imports and to the 10 percent average depreciation of the pound sterling against the East Caribbean dollar.

B. NATIONAL DEVELOPMENT PRIORITIES AND STRATEGIES

The current macroeconomic planning strategy of the Government of St. Vincent and the Grenadines (GOSV) is directed towards the development of a well-balanced, integrated public sector investment program.[2] This program is explained in the annual Economic Memorandum on St. Vincent and the Grenadines prepared jointly by the IBRD; IMF and Caribbean Development Bank (CDB) in close collaboration with GOSV. This memorandum is a key planning tool for GOSV.

The GOSV development strategy is devised to achieve the full exploitation of the economic potential through diversification of the productive base. Major attention is paid to strengthening and diversifying the agricultural sector and to improving the performance of the industrial and tourism sectors. This strategy is designed to achieve an increase in the rate of growth of the economy, a reduction in unemployment, and to relieve balance of payments and fiscal constraints on overall growth.

In the agricultural sector, GOSV strategy is directed towards further strengthening of the small farm sub-sector, aims at increasing agricultural production and foreign exchange earnings from a diversified base, and at improving extension services and marketing channels for agricultural products.

The GOSV strategy for industry has focused increasingly on the creation and strengthening of inter-sectoral linkages, with emphasis being placed on the development of agro-industry utilizing locally produced items and on the promotion of industries with high local value added. The strategy is designed to generate employment and export earnings, while at the same time producing foreign exchange savings as a result of efficient import substitution.

For tourism, the GOSV strategy recognizes that successful tourism development requires a combination of an effective promotional program, the development, improvement and enhancement of tourist attractions and the provision of a cadre of suitable trained personnel.

The GOSV places high priority on the development of programs to improve transportation and the availability of basic services, since the success of efforts in other sectors depends critically on the provision of adequate supporting infrastructure.

With respect to the private sector, GOSV strategy is directed mainly towards improving the climate for investment and towards the adoption of measures aimed at encouraging harmony between private sector investment and GOSV development objectives.

These previous statements indicate that the GOSV places high priority on the development of the agricultural sector. Another indication of the relative priority that the GOSV places on agriclture is the proportion of expenditures going to agriculture activities.[3] The capital expenditure for the GOSV for 1981/82 was about EC$65,000,000. Agricultural projects receive about 18 percent of this total. In terms of sources of funds for capital expenditure, the agricultural sector investments differed from those of the total GOSV capital expenditure as follows:

TABLE III
GOSV CAPITAL EXPENDITURE DISTRIBUTION BY SOURCE

Source	Total GOSV	Agriculture
	(percent)	
Local Revenue and Surplus Funds	11.2	0
Loans	34.4	32.5
Development Aid (BDD)	20.4	19.3
Other Grants	34.0	48.2
	100.0	100.0

Another indicator of the importance of agriculture as perceived by the GOSV is the fraction of recurrent expenses allocated to the Ministry of Trade and Agriculture (MTA) for its activities. It appears that the actual 1980/81 recurrent expenditures for the Ministry (including Agriculture and Lands and Surveys)

was EC $2,060,883. This represented four percent of the total 1980/81 recurrent expenditures of the GOSV.

It appears that the Government's agricultural commitment is matched by its allocation of a substantial proportion of its capital expenditures to agricultural sector investments. The lack of local revenue support probably indicates that agricultural capital projects are easier to obtain from outside sources than projects oriented to other sectors. The relatively low proportion of recurrent expenses which appears to be allocated to agriculture may indicate problems in the GOSV being able to provide recurrent expense support for external donor supported projects in agriculture.

C. AGRICULTURAL DEVELOPMENT OBJECTIVES, STRATEGY AND PRIORITIES

Broad agricultural development objectives of the GOSV are enumerated in the previous section. Further discussion and specific examples of measures taken to achieve these objectives are given in this section.

Objective 1 - Increasing agriculture export earnings

Increasing agricultural export earnings is a major objective. Efforts to increase banana and arrowroot starch production are being emphasized along with newer efforts to promote tobacco and peanut production for export. To have foreign exchange for food, consumer goods and industrial material, agriculture is looked to as the major foreign exchange earning sector. The following recent examples of government action to achieve the objective of increasing export earnings were taken primarily from the budget address of the Prime Minister and the Economic Memorandum:

1. Aid has been received from the U.S.A. and U.K. to assist the banana industry to recover from the effects of Hurricane Allen.
2. The five-year Banana Development Programme financed by the British Government is continuing.

3. Government is negotiating with Caribbean Development Bank for a loan to develop an integrated arrowroot development programme.
4. A study of the end user and market for arrowroot starch has been completed under auspices of USAID Project Development Assistance Program.
5. The Canadian International Development Agency has been asked to assist with development of new arrowroot varieties.
6. The Agricultural Development Corporation is involved in price negotiations with the West Indian Tobacco Company.
7. Action has been taken by CARDI to assist in the control of root-knot nematode in carrot production.
8. The control of the coconut mite is being assisted by the Government of Trinidad and Tobago.
9. Donor support is being sought for a coconut development program.

Objective 2 - Import substitution

Import substitution of agricultural commodities is also a major objective. The theme of the August 1982 National Exhibition "Produce More - Import Less" alluded to this policy objective. Recent government actions to achieve this objective were reviewed in the budget address as well.

1. The reintroduction of sugar cane production and reconstruction of the sugar factory at Mt. Bentick has been administered by the Agricultural Development Corporation.
2. Steps are being taken to obtain a more suitable sugar cane variety.
3. Government sponsored stud stations remain in operation to improve quality of livestock production.
4. Rabbit production is being encouraged through government sponsored programs.
5. Animal health is protected and improved through such programs as the use of clinics in rural areas and the inspection of imported animals and animal products.
6. The Food and Agriculture Organization (FAO) has been requested to assist in the preparation of a fisheries project for presentation to the international donor community.

Objective 3 - Encouraging small holder agriculture

The objective of encouraging small holder agriculture is being pursued through leasing small units of land to individuals from government owned estates at Richmond Vale and Lauders. As soon as efficient and effective procedures have been clearly developed in these efforts, plans are anticipated for government purchase of other private estates and their division and sale of smaller units to farmers. The MTA is cooperating in the CARDI effort on small farm cropping systems research. Small farmer credit is being offered through a special program in the Agricultural Development Bank.

Objective 4 - Reduction of risks

Another major policy objective appears to be reduction of risk by development of export marketing contracts and diversification of production. The Marketing Corporation, Banana Growers' Association (BGA), and Arrowroot Association all strive to export agricultural products through contract agreements. Due to the recent natural disasters, increasing international competition in arrowroot, and emerging uncertainties about preferred status as a banana supplier to the United Kingdom, policy statements reflect an increasing concern for agricultural production diversity. Programs to support sugar cane, peanuts and tobacco production, are, in part, efforts to diversify the agriculture base.

Objective 5 - Reduction of food price inflation

Certain efforts are directed at keeping food prices from increasing rapidly. Much of this objective is addressed indirectly. Prices are subsidized for certain agricultural inputs such as credit, stud fees, and certain seeds of improved varieties of various crops. Also, the government fosters competition for private individuals or firms in food retailing and farm-to-market commodity marketing.

Further evidence of agricultural development objectives and strategies were contained in the publication announcing the National Agricultural and Industrial Exhibition and are quoted here:

Acting Prime Minister H. K. Tannis:

"The mainstay of the economy of St. Vincent and the Grenadines will, for many years yet, still be in the direction of agriculture. It is for this reason that Government has been paying particular attention to this sector of the economy by keeping our agriculture as widely diversified as possible."

Minister of Trade and Agriculture V. F. Beache:

"...any new thrust in production must be geared towards (1) 'self-sufficiency' and (2) 'Export Orientation." Whilst we must strive to produce more for export markets, we must also be prepared to utilize more of what we produce."

Chief Agricultural Officer C. J. Williams:

"The aims of agriculture should be towards full employment of the maximum of the populace, proper nutrition of our people, the establishment of secondary industries to provide further employment and the earning of foreign exchange to pay for these goods and services which we must import."

Specific priorities for the agricultural sector were identified in the Economic Memorandum and are summarized below:

1. continued support to the banana industry;
2. support to the delivery of agricultural credit and supervised farm credit;
3. strengthening of extension services;
4. assistance to the Marketing Board in making contacts in importing countries;
5. Strengthening of animal health and breeding programs;
6. support to the arrowroot industry;
7. support for an agricultural census;
8. establishment of facilities for the fishing industry; and
9. support to the coconut industry.

D. SECTOR PLANNING AND PROGRAMMING CAPABILITIES

Agriculture planning and programming capabilities exist in the MTA and in the Central Planning Unit (CPU) which is in the Ministry of Finance and Prime Minister's Office. However, within these institutions, no individual is assigned solely to agricultural planning and programming. The Government recognizes the need to develop additional resources in this area and is currently having discussions with FAO and UNDP regarding the employment of an agricultural planning economist.

The Central Planning Unit has responsibility for economic planning, maintaining statistics for planning, physical planning, relations with lenders, foreign financial institutions, and other external agencies relevant to development aid. Development priorities and strategies are developed in the Prime Minister's office and in the Cabinet. Then, problems and proposed projects are identified and submitted by appropriate Ministries or by a Planning Committee organized by the CPU. This Planning Committee consists of the Permanent Secretaries and heads of key departments from the Ministries. It discusses available resources and allocation to various projects. Once a project is considered worthy of implementation, the CPU seeks appropriate funding either internally or externally. Over 90 percent of the development projects are externally financed. All requests and negotiations for external assistance reportedly go through the CPU.

The MTA planning and programming responsibilities reside in the individuals in key positions such as the Permanent Secretary, Chief Agricultural Officer and Unit Heads. An agricultural planning study was completed in 1975 which resulted in the St. Vincent National Agriculture Plan (SNAP). The Committee that completed this work included several technical personnel from MTA, the present Minister of Trade and Agriculture and a British Development Division (BDD)

technical advisor. This effort was clearly a result of the need felt by Ministry personnel to develop more direction to agricultural development activities. The plan consisted of 112 specific recommendations but manpower and financial implications of the various programs or the relative priorities were not discussed in the document. However, these issues were specifically addressed in several subsequent meetings by a select committee. Technical personnel were directed to develop projects that were consistent with the plan. This occurred in some cases.

Programming and implementation efforts typically consist of appointing a ministry employee to manage a specific project. Financial accounting support is available but little management, supporting, or data services are available for assisting the project manager.

Several units within the MTA have specific statements regarding needs. Project ideas are supposed to be submitted to the Chief Agricultural Officer who may pass the idea to the Permanent Secretary and consequently the Minister. With approval, the project idea is submitted to the CPU as described above. This mechanism within the MTA appears to require further development and support to be efficient and productive in terms of quality project development. At present, some unit heads appear to lack information on projects that are submitted to CPU, projects being discussed with donor agencies and procedures for developing and properly submitting proposals.

The mechanism for cooperative work between the CPU and MTA in developing quality project proposals and programs for assistance is a potentially valuable process which may require further development and strengthening.

E. AGRICULTURAL DATA BASE

Statistical data on agriculture in St. Vincent is limited and sometimes questionable when available. The systems of land tenure, household labor, and multiplicity of jobs do not easily fit into normal classification schemes while

the absence of records on the part of both individuals and institutions make the collection of the data difficult. In 1977, a project to register farmers was undertaken to assist with marketing planning. Due to data collection problems, the resulting information has not proved very useful. However, despite the lack of statistical data, several studies and surveys have been conducted which together provide a partial description of Vincentian small farmers, farms and other agricultural aspects.

The major sources for Vincentian agricultural data are the following:

1. The 1973 Agricultural Census was carried out under the direction of the British Development Division. This was the third agricultural census in St. Vincent with the first in 1946 and the second in 1961. The census provides information concerning land tenure, land use, labor participation, livestock production, use of farm inputs, and produce prices.
2. The Agricultural Statistical Unit is located in the Ministry of Trade and Agriculture. This unit collects, on a regular basis, information pertaining to climatic conditions, agricultural trade statistics, agricultural prices, and data on fish landings. Such information was compiled into a 1978 Digest of Agricultural Statistics. A 1981 digest is currently at the government printers. After the 1977 Soufriere eruption and the 1980 hurricane, the unit registered a number of farmers but the information has not yet been compiled.

   The MTA's Statistical Unit has one statistician and two assistants. The statistician is a temporary resident of the country. Extension field officers sometimes help in gathering of information.
3. The Statistical Digest is published annually by the Ministry of Finance, Planning and Development. The digest includes statistical information pertaining to agricultural exports and imports, estimated production of selected commodities, monthly retail prices of food items and agricultural contribution to GDP.
4. Surveys, studies, and academic theses undertaken by a variety of agencies, organizations, and individuals. Relevant documents which were used for drafting this report are listed in Appendix III.

F. PUBLIC AND PRIVATE SECTOR SERVICES FOR AGRICULTURE

Research

The Caribbean Agricultural Research and Development Institute (CARDI) is the primary agricultural research institution in St. Vincent. CARDI, a regional organization, became involved in St. Vincent in 1978 with a project on multiple-cropping systems. The main objective of the various programs is to improve the social, as well as economic, welfare of the whole farm unit through research. CARDI's clientele are farmers with one to five acres of land. The Vincentian CARDI staff consists of the coordinator, three agricultural officers, and an extension agent seconded from MTA. At least five more CARDI efforts, including a peanut project, a walking tractor project, and an integrated pest control project, have since been undertaken. The projects have been applicable and useful to Vincentian farmers. CARDI has no experimentation land in St. Vincent.

The multiple cropping systems project has involved in-depth research over a period of four years with a select group of 19 farmers. Through the research, CARDI helps to identify constraints within the farming systems and make recommendations to improve farming systems to increase income, employment, and nutritional levels of farm families. Through the walking tractor project, four 12-horse power tractors were provided to different farmers with the experience being continuously evaluated. In the peanut project, a new variety of peanuts has been introduced along with improved agronomic techniques. One of the CARDI officers is working closely with 10 farmers keeping records of the effects of the new technologies. Inputs are provided by CARDI in return for seed after harvesting.

The CARDI staff work closely with the MTA. They act as resource personnel by providing research findings, and through taking part in seminars, in-service training and ministry committees.

The MTA has a Research Unit headed by an agricultural officer who draws upon extension personnel for assistance. His work is severely limited by lack of government transportation, facilities, and equipment. At present, applied research on onions is being conducted through variety testing and agronomic studies. The MTA has initiated a program to extend results of these efforts. Some applied research also occurs at district agricultural stations.

Substantial research in bananas has been conducted by WINBAN. Research on specific agricultural problems has also been implemented by the Organization for Rural Development (ORD), the Arrowroot Association, and other groups.

Extension

The MTA provides most of the agricultural extension service in St. Vincent. Information, advice and services are extended primarily through the personal visitation method although result demonstration and training seminars are also occasionally used. The effectiveness of the service is constrained by a number of factors which include inefficient support systems (overall planning, credit, marketing, inputs), under staffing, limited technical expertise, transportation and communication problems and lack of facilities and equipment. For instance, in 1982 there were 17 agents with responsibility for field extension work in St. Vincent. No one was assigned to the Grenadines.

A National Extension Plan has been developed to address the major constraints to agricultural extension work in St. Vincent. Other MTA units provide services which involve health care, animal breeding, plant protection, and plant propagation.

The Organization for Rural Development (ORD), a private organization, has rural development workers in the less accessible areas of St. Vincent. Through the work of the central office and three field supervisors assisted by 13 voluntary field corps workers, ORD is involved in introducing improved varieties

of local crops, developing a small farm credit scheme, establishing easier access to inputs, and providing educational seminars. To increase the technical expertise of the staff, ORD has obtained a Peace Corps nutritionist and two French agronomists, has embarked on an intensive training program, and consults personnel of CARDI, the MTA and elsewhere as needed.

Extension-type workers are also employed through the Banana Growers' Association and the Arrowroot Association to focus exclusively on those crops. In addition, CARDI has projects which include extension work in selected areas of St. Vincent.

Credit

The main sources of credit for the Vincentian farmers are:

1. The commodity associations and other agricultural organizations;
2. The Agricultural and Cooperative Bank, now a part of the Development Corporation;
3. Commercial Banks; and
4. Informal credit from shopkeepers and hucksters.

The commodity associations provide members a credit service for fertilizer and agricultural chemicals, labor, and planting material. These loans are repaid by simply sending the receipts of the arrowroot or banana sale to the bank where loan payments are deducted and the balance deposited in the farmers' account. This method is relatively risk free for the lending institution and results in almost no transaction costs for the farmer.

Several agricultural organizations such as ORD, and in the past, CARDATS, provide revolving credit funds or in-kind loans to farmers participating in their projects.

The Agricultural and Cooperative Bank was established in 1969 with the expressed purpose of lending to farmers. However, both the number of loans and the amount of the loans have remained low. The bank merged with the Development Corporation

in 1982 in order to increase efficiency of agriculture lending. Loans can be made to farmers with net worths of over EC $150,000 at commercial rates. A farm improvement loan program is also available at subsidized rates of six to eight percent interest to farmers with net worths less than EC $150,000. Collateral must be received by the bank for either of these loans. A third potential farm loan program, the Agricultural Production Credit Program, was not adopted by the GOSV. This program which required the lending institution to charge full cost interest rates (about 12%) was to be made available to small farmers with no collateral requirement. The basic rationale for the program was that self-support credit programs would provide continuous wide access to farmers who would be willing to borrow at commercial rates. Three basic reasons were given by the GOSV for not adopting this program:

1. concern about collection in case of repayment failure;
2. lack of risk sharing by the CDB; and
3. concern about charging farmers high interest rates.

The bank charges a EC $5.00 application fee and 1/2 of one percent for the appraisal. Collection problems are small for banana and arrowroot farmers because of the loan payment service provided by the Commodity Association. However, for farmers of other commodities, the Marketing Corporation does not provide the same service in terms of payments directly to the bank for the purchase of goods from farmers. Current arrears are about 20 percent of total loans, but the percentage is declining.

Commercial banks also participate in farm loan programs. Interest rates range from 11 percent for 4-5 year loans to 12-13 percent for shorter loans. Several commercial banks have experience in lending to farmers. Indications are that these sources of credit are valued due to the relative speed of obtaining a loan and the ability to borrow for needs other than strictly agricultural production requirement.

Inputs

Sources for agricultural input supplies are limited in St. Vincent and shortages or unavailability of the inputs are frequent. The main input suppliers include the commodity associations, the Marketing Corporation, and the MTA. The Banana Growers' Association (BGA) and the Arrowroot Association supply fertilizer and agricultural chemicals to their members. Non-members also buy these inputs from association members or directly from BGA.

The Marketing Corporation sells vegetable seeds and irregularly sells some agricultural chemicals. Through the MTA, farmers can obtain, when in stock, agricultural chemicals and animal health supplies. Other sources include several small private businesses in Kingstown and projects by organizations such as ORD and CARDI which supply particular inputs to participating members. In general, farmers throughout St. Vincent and the Grenadines islands must journey to Kingstown to purchase needed supplies or arrange for delivery through the private transport drivers.

G. NATURAL RESOURCES

The climate of St. Vincent is characterized by rainfall that ranges from about 150 inches a year in the central mountains to about 60 inches near the coast. Daily temperatures range between 60^{o}F and 88^{o}F.

The rainfall distribution shows a zonation of climate in concentric belts around the central mountain core. The highest mountains lie in the north of the island and receive the most rainfall. The driest area is found on the south-east coast. Most of the island, except for about a quarter mile wide band extending along the shoreline, receives in excess of 75 inches of rainfall yearly. About 70 percent of the total annual rainfall occurs during the months of May through November. January to April, when the North-East Trade Winds predominate, is the driest time of the year and results in a pronounced dry season of two to six months in coastal areas.

The island is composed of volcanic material which has produced a mountainous land surface, elliptical in shape with the greatest length in the north-south direction (18 miles) and a width of 11 miles. Geologically the island is made from a chain of volcanos whose craters coincide with the central range of hills. Volcanic activity has persisted in the north long after it had died out in the south. The most common rock type is agglomerate composed of andesitic and basaltic materials.

Natural vegetation persists only in the central highlands and on the crests of some steeply sloping ridges near the coast which are covered by a dry-scrub woodland. The central mountain vegetation is of a secondary nature with areas of rain forest at the heads of some larger valleys. The different rainfall zones are mainly responsible for the concentric zones of vegetation. Thus, the inner zone of continuous rainfall produces rain forest which is surrounded by a zone of evergreen seasonal forest, itself surrounded by a zone of semi-evergreen seasonal forest; both characterized by weak and marked dry season resulting in development of deciduous forest. Other factors like topography and geology modify the dominant vegetation occuring within the generally concentric zones, such as around the recently active Soufriere Volcano. Natural vegetation has stabilized steep slopes in uncleared areas and allowed soils to develop.

The soils of St. Vincent are derived from volcanic materials of intermediate and basic origin with varying degrees of weathering and age. The predominant soil orders are Inceptisols, Entisols, Ultisols, and Vertisols with Tropept and Ustult sub-orders predominating. The Vertisols (previously classified as Shoal Soils) occur mostly in the south and south-west coastal areas of the island. Soil fertility varies considerably and acidity and phosphate deficiencies occur. Some micronutrient imbalances may be expected on the most recently deposited volcanic ash soils.

In the area of land use, remnants of forest exist only in the central mountains. The importance of this forested core in the island is to serve as a vegetation blanket with a high potential to absorb the heavy rainfall which is gently delivered to the outlying drainage basins to give regular flow and discharge. Only in the north of the island, where vegetation is limited due to recent volcanic activity and porous soils do dry streams occur.

The area surrounding the central forested core is characterized on the western side of the island by a youthful topography that has many narrow valleys with steep slopes. The eastern side of the island has been exposed to more terrace formation and modifications producing a more rolling landscape. Most of the cultivated land is used for mixed cropping including pasture, tree crops and ground crops. Most of the pasture and dry land scrub is found on the vertisols. Ground provisions and crops include cassava, sweet potatoes, pigeon peas, corn, tannia, eddoes, and yams. Peanuts have recently been reintroduced into the cropping systems along with a variety of vegetables such as cabbage, carrots and tomatoes.

In the past, the more level lands have been planted in the traditional plantation crops such as sugar cane, bananas, cotton, and arrowroot. In more recent years, however, many of the areas have been divided up among small mers who use the traditional mixed farming methods as opposed to monoculture.

The prevalence of steep slopes on most of the cultivated land in St. Vincent dictates that there is a high erosion hazard. Fortunately, the accepted planting methods in the island contribute towards soil conservation. Very seldom do farmers plant crops on the slope without using ridge and furrow methods following the contour. The need for soil conservation measures remains important, however, and must continue to be encouraged particularly as more fields come under cultivation and in areas where crops which have a high potential for soil erosion are grown.

Forest management in St. Vincent is limited mainly to protecting the existing forest. Reforestation in catchment areas and along banks of streams and rivers has received attention by planting some valuable tree species and fruit trees in denuded areas. The reforestation efforts need to be maintained and expanded. Five of the main watersheds of the island are under forest management with the aim of increasing stream flow for domestic use, hydro-electricity and agriculture. Reforestation efforts are in particular demand in the Grenadines where past clearing of land for cotton cultivation and now over-grazing have aggravated the shortage of water problems.

There exists a potential for a large fishing industry in the sea surrounding St. Vincent and the Grenadines. The fish catch along the coastal waters is estimated at about 900 tons annually which is insufficient to fill the local demands of about 1200 tons per year. St. Vincent has joined the United Nations Convention on the Law of the Sea. Utilizing the benefits of this convention will require determination and negotiation of boundaries with several Caribbean countries and Venezuela, survey of fish resources and regulation of fishing activity within the boundaries. At present, little is known about the fishing industry within the Nation and the ability of the Fisheries Unit within the MTA is severely limited with only two employees (one is Peace Corps) and no equipment or support for transportation. Two small freshwater prawn tanks, 6' x 24' were constructed at the Botanic Gardens as an introduction to aquaculture. Both river lobster and crayfish are being farmed. A Taiwanese team is currently establishing a small-scale fresh water Tilapia-pork production unit. FAO assistance has been requested to assist in the preparation of a fisheries project for presentation to the international donor community.

H. CROP AND LIVESTOCK PRODUCTION AND MARKETING

Crops

The crops grown in St. Vincent in 1980 are shown in Table IV in order of their importance by value. As can be seen from the table, a great diversity of crops are grown in St. Vincent.[4] Table V contains information on a number of commodities, over time.

Banana production, except for a few commercial plantations located on flat lands, is situated on sloping land often having steep gradients. The most common size banana farm is 1-2 acres with low yield (about five tons per acre). The difficulty of the sloping terrain and poor accessibility to the lands reduce quality. Even commercial plantations report yields of only around 10 tons per acre compared to the 30 tons per acre of large commercial planting in Central America.

Banana, the largest export crop in St. Vincent, accounted for about 20 percent of the total WINBAN crop. About 85 percent of the bananas is produced by farmers with less than 25 acres. Banana and plantain are planted and harvested year round. Most are grown in pure stands. Family labor is primarily used for all the stages of banana production from planting to transportation of the fruit to the boxing plants.

Arrowroot production ranks second in export value to that of bananas. Most of the 500 or so growers have about a half acre cropped area and two large farmers have 350 and 175 acres each. Most of the arrowroot holdings are in the northeastern portion of the island. Average yields per acre are about 12,000 pounds of rhizomes as compared to potential yields of between 20,000 - 30,000 pounds per acre. Starch production is estimated at about 1,800 pounds per acre in 1981 Total starch production has been declining as well as percentage starch yield from roots (13% in 1976 to 11% in 1980) due to lower starch yield of rhizomes and below average efficiency of factories.

TABLE IV

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

Commodity	Quantity	Value in EC $
Bananas	46,144,737 lbs.	21,400,000
Coconuts	10,737,882 no.	3,220,00
Eddoes	4,030,625 lbs.	2,620,000
Arrowroot starch	10,000 brls.	1,995,000
Sweet potatoes	4,652,375 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.)	1,269,900 "	793,000
Yams	1,000,000 "	750,000
Tobacco	190,000 "	666,400
Cocoa beans (est.)	-	465,920
Carrots	900,000 "	450,000
Nutmets	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: Data obtained from the Agricultural Statistics Unit, Ministry of Trade and Agriculture.

Table V

Production and Export Information for Selected Agricultural Commodities in St. Vincent and the Grenadines for the Years 1961 and 1978

Commodity	Production (000 lbs.)	Area (acre)	% of total ag. area	Yield per acre (lbs.)	# holdings in production	% of all farm holdings	Amount Exported (000 lbs.)	% of total domestic export value	Export value (000 E.C.$)	Market Price (E.C.$)
Banana										
1961	73,3[illegible][d]	5,399	20.1	-	-	-	-	-	-	-
1978	71,934	5,000	25.5[c]	10,080	3,735	47.6	67,709	47.4	19,933	.28[b]
Arrowroot										
1961	10,663[d]	3,000	11.23	-	1,300	12.2	6,446	-	-	-
1978	1,863	900	2.3[c]	2,463[c]	380[c]	4.9	1,750	4.4	1,853	.35[b]
Coconut (copra)										
1961	5,72[illegible]	3,983	32	-	-	-	-	-	-	-
1978	3,658[b]	5,300	38.5[c]	-	2,863	36.7	642	3.7	1,570	.17[b]
Sweet Potato										
1961	3,476	1,272	5.6	2,730	2,137	30.0	-	-	-	-
1978	3,493	733[c]	3.8	3,531[c]	2,049[c]	26.3	2,713	2.3	970	.35[b]
Dasheen, Eddoes, Tannias										
1961	1,458	1,071	4.72	1,360	5,328	50.9	-	-	-	-
1978	with yams*	818[c]	4.25[c]	3,919	1,381	20.5	5,078	5.9	2,475	.47[b]
Yams										
1961	883	475	2.1	1,859	3,651	37.8	-	-	-	-
1978	6,895*	292[c]	1.5[c]	4,976	2,381[c]	30.5	1,083	1.4	578	.53[b]
Ginger										
1961	-	-	-	-	-	-	-	-	-	-
1978	1,915	60[c]	.3[c]	2,441[c]	313[c]	4.0	635	1.1	452	-
Plantains										
1961	-	8	.36	-	-	-	-	-	-	-
1978	1,892	33[c]	.9	-	645	8.3	1,550	0.9	374	-
Nutmeg and Mace										
1961	128[d]	-	.26	-	-	-	-	-	-	-
1978	217[c]	91[c]	1.7[c]	2,400[c]	611	7.8	327	0.9	363	.99[b]
Carrots										
1961	-	-	-	-	-	-	-	-	-	-
1978	964	-	-	-	-	-	677	0.8	326	.49[b]

Table V (continued)

Production and Export Information for Selected Agriculture Commodities in St. Vincent and the Grenadines for the Years 1961 and 1978

Commodity	Production (000 lbs.)	Area (acre)	% of total ag. area	Yield per acre (lbs.)	# holdings in production	% of all farm holdings	Amount Exported (000 lbs.)	% of total domestic export value	Export value (000 E.C.$)	Market Price (E.C.$)
Tobacco										
1961	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	64	0.7	274	-
Cocoa Beans										
1961	150[d]	603	1.73	-	-	-	-	-	-	-
1978	265[c]	105[c]	1.2[c]	2,181	1,190	15.3	61	0.6	200	-
Mango (ordinary & grafted)										
1961	-	-	3.87	-	-	-	-	-	-	-
1978	12,657	160	3.9[c]	78,981	2,729	35	382	.5	229	-
Peanuts										
1961	-	-	-	-	-	-	-	-	-	-
1978	151	672[c]	3.49[c]	205[c]	453[c]	5.8	121	.4	157	1.35[a]
Citrus										
1961	-	37+	.32	-	-	-	-	-	-	-
1978	13,230	194[c]	2.71[c]	-	3,731	47.9	117[a] (oranges)	-	31[a] (oranges)	-
Avocado										
1961	-	-	.7	-	-	-	-	-	-	-
1978	264	30	.6	8,800	1,150	14.8	186	-	-	-
Pigeon Peas										
1961 Green	161	720	3.18	223	3,779	36.1	-	-	-	-
Dry	138			196						
1978 Green	185[c]	490[c]	2.55[c]	378[c]	2,782[c]	35.7	-	-	-	-
Dry	57[c]			116[c]						
Maize										
1961 Green	215	512	2.26	420	2,997	28.6	-	-	-	-
Dry	204			397						
1978 Green	202[c]	324[c]	1.68[c]	623[c]	1,269[c]	16.3	-	-	-	-
Dry	76[c]			235[c]						
Pumpkins										
1961	-	-	-	-	-	-	-	-	-	-
1978	264	-	-	-	-	-	299	0.3	111	-

Table V (continued)

Production and Export Information for Selected Agriculture Commodities in St. Vincent and the Grenadines for the Years 1961 and 1978

Commodity	Production (000 lbs.)	Area (acre)	% of total ag. area	Yield per acre	# holdings in production	% of all farm holdings	Amount Exported (000 lbs.)	% of total domestic export value	Export value (000 E.C.$)	Market Price (E.C. $)
Breadfruit										
1961	-	37	3.3	-	-	-	-	-	-	-
1978	-	-	2.1[c]	-	3,437	44.1	-	-	-	-
Golden Apple										
1961	-	-	-	-	-	-	-	-	-	-
1978	-	-	-	-	-	-	194	-	15	-
Eggplant										
1961	-	-	-	-			-	-	-	-
1978	484	-	-	-			429	-	-	-
Cabbage										
1961	-	-	-	-			-	-		-
1978	299	-	-	-			-	-	-	-
Cucumber										
1961	-	-	-	-			-	-	-	-
1978	363	-	-	-			-	-	-	-
Tomatoe										
1961	-	-	-	-	1,028[c]	15.2	-	-	-	-
1978	229	-		-			2	-	-	-
Sweet Peppers										
1961	-	-		-			-	-	-	-
1978	110	-	-	-			7	-	-	-
Onions										
1961	-	-	-	-			-	-	-	-
1978	11	-	-	-			-	-	-	-
Coffee										
1961	3	10	-	280	-	-	-	-	-	-
1978	-	704[b]	-	-	124[c]	1.6	-	-	-	-

Table V (continued)

Production and Export Information for Selected Agriculture Commodities
In St. Vincent and the Grenadines for the Years 1961 and 1978

Commodity	Production (000 lbs.)	Area (acre)	% of total ag. area	Yield per acre	# holdings in production	% of all farm holdings	Amount Exported (000 lbs.)	% of total domestic export value	Export value (000 E.C.$)	Market Price (E.C.$)
Cassava (Starch)										
1961	113	273	-	437	-	-	-	-	-	-
1978	206	110[c]	1.42[c]	2,689	581[c]	7.5	-	-	-	-
Sugar Cane										
1961	71,458	1,095	4.83	65,258	574	5.6	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-
Cotton										
1961	50	104	.46	484	268	2.6	-	-	-	-
1978	-	-	-	-	-	-	-	-	-	-

Note: [a] 1960
[b] 1977
[c] 1972
[d] 1963

Arrowroot production faces a number of constraints which include high labor costs, unreliable and inefficient processing factories, limited knowledge of end uses, increased soil erosion, and inadequate research concerning varieties, mechanization, and utilization of byproducts. Despite production constraints, arrowroot flour is currently being stockpiled in St. Vincent due to production competition by Brazil and the use of alternative starches by previous users.

The Arrowroot Association provides credit to the small farmer to obtain fertilizer, planting material, and to hire labor for harvesting. The association also grades, packages, stores, and ships the processed flour.

Coconuts are produced in St. Vincent primarily near the coast from the mid-eastern section to the northeastern part of the island. Around 5,600 acres, with nearly 400,000 trees were planted in nearly pure stands of coconuts in 1972. Most of the harvested nuts are processed into copra which is used for the production of edible oil for local consumption and export. Coconut and coconut oil production has declined in recent years due to Red-Ring and coconut mite diseases and the natural disasters of 1979 and 1980. Production of coconut and coconut oil has decreased to about 3.8 million nuts and slightly more than 100,000 gallons of coconut oil in 1980.

Sugar cane production in St. Vincent virtually ceased after the closing of the sugar factory in 1962. Production of the cane has only recently been reintroduced. In 1981, a government sugar processing factory near Georgetown was completed. The government-owned Langely Park Estate near the factory has been planted in cane. In 1982, 1300 acres was planted in cane yielding 1762 tons of sugar.

The country's sugar imports should be cut as a result of the new factory. In 1979, 7,672,700 pounds of unrefined sugar valued at 2,600,00 (EC$) were imported into St. Vincent. Of all the food imported, sugar was second only to milk in terms of value.

Other Crop Production

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, creating large fluctuations in prices. Grown primarily by the small farm holders, the vegetable crops receive little herbicides, insecticides, or organic fertilizers. Many farmers use some chemical fertilizer, often obtained through the Banana Association, but the fertilizer is not necessarily optimal for vegetable or root crop production. Harvesting of the crops is done primarily through family labor although both family and hired labor may be used for the other production 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 regionally to Trinidad and Barbados. Ginger is a fairly recent export crop which, like many of the crops, is struggling to balance production with markets. In 1975, about half of the ginger crop was not even harvested because of marketing problems. All of the root crops are grown in both pure and mixed stands.

The main vegetables grown in St. Vincent include cabbage, cauliflower, melons, pumpkins, cucumbers, lettuce, eggplant, tomatoes, peppers, beans, and okra. A high demand for such vegetables exists both locally and regionally, but their production is usually seasonal - during the wet season. This indicates a need to consider implementation of irrigation systems.

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 export 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 might also 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 1974, 70,000 pounds of nuts were exported, this amount was less than 10 percent of the amount exported in 1954. The emphasis on bunch varieties and improved agronomic practices by CARDI, CARDATS, and ORD is once again increasing the planting and production of the ground nuts.

According to the 1972 census, some 9,687 acres of land were planted in permanent tree crops. Approximately 5,600 acres were in coconuts, 700 acres in cocoa, 400 acres in nutmeg (121 acres bearing), 180 acres in limes, 49 acres in oranges, and 40 acres in grapefruit. The remaining acres primarily held breadfruit, mangoes, avocados, sugar apple, soursop, golden apple, sapodilla and coffee. Tree crop production is encouraged by the sale of trees at low prices from the Agricultural Department's propagation stations.

Cocoa exports amount to around one-fifth of the cocoa produced. Most of the cocoa is sold locally in the form of cocoa "sticks." Nutmeg is a crop of high value for the area it occupies. There seems to be room for increased production of nutmeg in St. Vincent. Pure stands of lime have been planted in St. Vicnent since the construction of a lime oil and juice processing plant in 1969. Grapefruit comes into season early in St. Vincent. Therefore, regional exports to Barbados and Antigua have been expanded.

Maximum mango production occurs between May and July with a small crop in November and December. Most of the trees are scattered throughout the island. Although it is difficult to transport the fresh fruit, 158 tons of mangoes were exported to Great Britain in 1980.

St. Vincent exports more avocados (99 tons in 1978) than its neighboring islands. Most of the fruit goes to Trinidad and Barbados, but some is also exported to Great Britain and the Netherlands. As with mangoes, avocado trees are spread throughout the island. It is estimated that the total surface planted with avocados amounts to around 30 acres.

Cassava is produced in different localities throughout the island. Farina is produced from the tubers and sold both locally and regionally. Corn is not consumed much by the people of St. Vincent, but it is important as livestock feed. The plant is frequently intercropped with other produce such as peanuts.

Tobacco is grown on a limited scale at Peters Hope Estate, Union Estate, and on several small farms. In 1979 the value of exported tobacco was about equal to that of plantains. Cotton production in St. Vincent has virtually disappeared since the destruction of the cotton ginnery in the 1960's. Disease and high labor demands also contributed to its demise.

Livestock

Throughout the last 20 years the livestock population in St. Vincent has remained static or declined with the exception of sheep as shown in Table VI.

TABLE VI

LIVESTOCK POPULATION IN ST. VINCENT, 1960-1979
(number of animals)

Stock	1960 Total	1970 Total	1979 Estimates
Sheep	5,523	6,022	12,000
Goats	6,867	4,198	3,500
Pigs	5,472	5,524	5,000
Poultry	59,165	49,406	39,700
Cattle	6,845	4,469	6,300

SOURCE: St. Vincent National Agricultural Program, 1975, p. 14.

Over the same period of time, beef and chicken imports have steadily increased while pork and mutton imports have fluctuated. Table VII shows the livestock products imported in 1965, 1970, and 1978.

TABLE VII

ST. VINCENT MEAT IMPORTS IN 1965, 1970, 1978

Commodities	1965 lbs.	1979 lbs.	1978* lbs.
Beef Products	35,250	56,639	188,494(canned)
Mutton Products	37,187	14,227	12,562
Pork Products	170,431	364,680	210,567
Poultry Meat	279,139	1,035,266	2,637,100

*From Agricultural Statistical Digest, p. 27

SOURCE: St. Vincent National Agricultural Program, 1975, p. 14.

Vincentian farmers could potentially produce enough livestock to satisfy the country's meat needs. The St. Vincent National Agricultural Program (1975) cites the following six reasons for the underutilization of the livestock potential in St. Vincent:

1. Lack of a definite livestock program by Government;
2. The high incidence of praedial larceny experienced throughout the state;
3. The high cost of imported feeds coupled with underutilization of local feedstuffs; [5]
4. Slaughter and export of breeding stock;
5. Comparatively low prices paid to livestock farmers; and
6. Exportation of live animals.

The Henderson and Gomes survey (1979) of small farm households adds another reason: the unsuitability of the land in both terrain and accessibility. The generally steep nature of the land with its light volcanic soils make it difficult

and sometime hazardous to rear animals, particularly cattle. Praedial larceny seems to be a problem when animals are kept on any land other than that immediately surrounding the home.

The animals are generally staked or tethered and left to forage for themselves or are brought cut grasses and household wastes. This sytem of livestock management demands little in terms of production or labor costs. The livestock products are used mainly by the household or sold to others in the community. Efforts to increase animal production in St. Vincent through the small farmer must take into account the current delicate balance of time, labor, and land use.

The Ministry of Agriculture maintains eight livestock stations spread throughout the island. The stations are basically breeding centers, each providing stud services for cattle, sheep, goats, and pigs. Rabbits are bred for sale at three of the stations. The Ministry's vet unit has continued and expanded regular livestock clinics throughout the island.

The 1979 volcanic eruption contributed to the decline in the livestock numbers. Many animals were stolen. Others were killed by the effect of the volcano.

In 1972, 63 percent of the cattle population in St. Vincent and the Grenadines were on farms 10 acres and less in size. Most of the cattle were dairy cows kept by the households for milk. The government has started a dairy at Diamond Estate which reconstitutes imported milk powder, mixes it with some fresh milk, and treats the product so it can remain on the shelf unrefrigerated for a period of time (unless opened). Fresh milk is unavailable in the stores; the selling of dry milk is restricted by government policy, and the dairy's reconstituted milk sells for 1.25 E.C.$ per pint.

Coconut estate owners are encouraged to produce beef by grazing cattle under the palms. Of the 6,300 cattle in St. Vincent and the Grenadines in 1979, around 1,640 were beef animals, mainly situated on the larger farms.

Sheep and goats are raised primarily by the small farmer. In 1972, 89 percent of the sheep and 84 percent of the goats in St. Vincent and the Grenadines were produced on holdings of five acres and less. The stock are usually tethered and periodically moved, although the Grenadines have an open range season during the driest periods of each year. Between 1960 and 1979, the goat population decreased by almost 30 percent while the sheep population more than doubled. The change may be due, in part, to the Government's emphasis on upgrading the local sheep breeds by importing "Blackbelly" breeding stock which have proven to be highly prolific. The animals are primarily used for meat. Goats are only rarely milked. Although St. Vincent still imports mutton, it also exports sheep and goats primarily to Trinidad. In 1979, 1,508 sheep and 189 goats were exported.

Most pigs are raised by the small farmer who keeps several tethered or penned behind the household. In 1972, 87 percent of the pigs in St. Vincent and the Grenadines were raised on holdings up to five acres in size. The pigs generally subsist by foraging and by consuming household wastes. A pork processing plant was established in St. Vincent in the 1970's, but closed due to financial and management problems.

Farming households up to 10 acres in size produced 89 percent of the chickens in St. Vincent and the Grenadines in 1972. The chickens mainly run loose and are used for home egg and meat consumption. Between 1961 and 1979, the chicken population decreased by 33 percent. Disease is one reason for the decrease, but there is also little incentive to produce chickens. The unrestricted importation of chicken parts coupled with the high cost of local production make it difficult for a farmer to raise chickens for marketing. Local egg production satisfies most of the domestic demand, but most of the consumption of broiler parts is satisfied by imports rather than local production.

A project is underway to encourage the rearing and use of rabbits for meat. One problem seems to be that the rabbits are looked upon as pets and not as suppliers of food. The cost of food when foliage is not available was also reported as a constraint in rabbit rearing.

Most of the livestock production is for home consumption by families producing the animals. About 50 percent of the animals are slaughtered in the government abattoir and the rest on farms or by butchers in villages. Very few animals are transported; most are walked to the abattoir.

A feed mill is now operating in St. Vincent to provide quality mixed feeds for livestock rearing. This mill has contracts with farmers to encourage local corn production to replace imported corn. Much of the initial local sales of the mill are to poultry raisers with 80 percent going to layer operations and 20 percent to broilers.

Marketing

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, 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. The marketing officer was empowered to look for new markets to help expand production, to provide storage facilities, and to do as much as possible to get maximum returns for the farmers. In June 1975, the Board was reconstituted as the St. Vincent Marketing Corporation with specific functions that included:

1. Acting on behalf of the Government as importer of commodities, and
2. Stimulating, facilitating, and improving the production, marketing

and processing of produce in the State particularly for the benefit of the producer.

Since 1975, three rural purchasing depots and a new marketing complex in Kingstown have come into operation. The main headquarters building was constructed and equipped with British aid at a total cost of £303,400 and includes cold rooms, freezing rooms, a section for storage and dispensation of rice and sugar, a supermarket, and a suite of upstairs offices. As well as basic imports, the supermarket retails whatever fruit and vegetables are in season. Goods are sold at a low mark-up to provide competition to other food retailers for controlling inflation.

Specific export quotas are in place for carrots, sweet potatoes, and peanuts. These quotas and prices are established through the Agricultural Marketing Protocol (AMP) and are based respectively on surplus and deficits among AMP countries and cost of production studies. The existing quotas and recent shipments are given in Table VIII. There exists substantial market potential for increased production of these commodities to meet the fixed quotas.

TABLE VIII

ST. VINCENT MARKETING CORPORATION EXPORT QUOTAS AND RECENT SHIPMENTS

Commodity	Annual Quota (lbs.)	Destinations	Quantities Shipped In 1978	1979	1980	1981
			<——— (lbs.) ———			———>
Carrots	2,400,000	Trinidad	684,300	389,200	312,100	128,250
Carrots	420,000	Guyana				
Sweet Potatoes	4,320,000	Trinidad	2,538,975	1,636,240	1,005,945	2,269,400
Peanuts	250,000	Guyana		-0-	-0-	18,384

SOURCE: Conversation with Mr. A. C. Antrobus, Manager of the St. Vincent Marketing Corporation and records of exports from the Marketing Corporation or from persons with Marketing Corporation licenses.

The Marketing Corporation has experienced an upward trend in total sales in the past six years. Net profit has been positive and generally increasing (see Table IX). However, the recent experience in the main produce operation (buying from farmers and either exporting or selling this produce locally) and the supermarket have been substantially different (see Table X). The main produce operation has experienced declining sales and net income with a loss reported for 1981. For the supermarket operation, sales and net income have risen quickly so that at the present time, the supermarket operation is the predominant section of the Marketing Corporation (see Table XI).

TABLE IX

ST. VINCENT MARKETING CORPORATION
PROFIT/LOSS ACCOUNT

Details	1976	1977	1978	1979	1980	1981
	<———			EC$		———>
Total Sales	8,062,096	8,477,338	-	10,021,539	11,784,796	12,498,502
Total Cost of Sales	6,602,106	7,006,052	-	8,263,852	9,670,871	10,734,367
Total Gross Margin	1,459,990	1,471,286	-	1,757,687	2,113,925	1,764,135
Total Other Costs	1,010,818	959,246	-	1,236,761	1,368,365	764,272
Income	449,172	542,307	-	520,926	745,560	999,863
Other Income	6,213	19,636	-	17,762	16,959	26,570
Indirect and Administrative Expenses	226,964	338,864	-	384,676	387,998	438,466
NET PROFIT (for one year)	228,421	223,079	-	154,012	374,521	587,967
	(233,307 on accounts does not include fish market)	(233,877 on accounts does not include fish market)				

TABLE X

ST. VINCENT MARKETING CORPORATION
FINANCIAL STATEMENT

Details	1976	1977	1978	1979	1980	1981
	<---------- EC$ ---------->					
Main Produce Operation						
Sales	3,208,641	2,246,980	-	2,341,161	2,119,996	1,520,830
Cost of Sales	2,585,875	1,746,173	-	1,819,477	1,632,274	1,155,968
Gross Margin	622,766	500,807	-	521,684	487,722	364,862
Other Costs	415,609	392,280	-	496,279	487,520	382,637
Income	207,157	108,527	-	25,405	202	-17,775
Supermarket						
Sales	188,724	1,096,977	-	3,086,181	4,095,653	4,567,580
Cost of Sales	142,982	866,228	-	2,794,594	3,593,428	3,999,980
Gross Margin	45,742	230,749	-	291,587	502,225	567,600
Other Costs	16,099	36,765	-	144,128	168,215	208,738
Income	29,643	193,984	-	147,459	334,010	358,862

TABLE XI

ST. VINCENT MARKETING CORPORATION
FINANCIAL ANALYSIS

Details	1976	1977	1978	1979	1980	1981
	(as percent of total sales)					
Produce Operation	39.8	26.5	-	23.4	18.0	12.2
Retail Outlet	2.3	12.9	-	30.8	34.8	36.6
Rice	20.7	25.6	-	19.1	14.4	15.3
Sugar	37.1	34.9	-	25.9	32.1	34.8
Fish Market	0.1	-		-	-	-
Agrolab	N.A.	N.A.		0.9	0.8	1.2
TOTALS:	100.0*	100.0*		100.0*	100.0*	100.0*

*Totals may not add due to rounding.

The reasons for this recent history are not clear. Traffickers may be providing increased buying competition for some commodities. Reduced production of commodities like carrots due to disease and possible price problems also account for part of the reduced agricultural produce business of the Marketing Corporation. Further study of the Marketing Corporation and the environment it must operate within is warranted. A limited study by the PDAP project will be initiated soon to investigate warehousing and mangement functions.

Hucksters and traffickers are a special group of traders, male and female, who perform important and difficult market functions in St. Vincent. Hucksters are distinguished from traffickers in that they are involved only in domestic trade. Hucksters are generally small traders, mostly women, who buy and sell fresh produce and other products on the island. They purchase products from the farmer, usually on cash basis and then sell the products in the retail market. In general, products are not stored prior to retailing but usually washed and sometimes sorted or graded first.

A large number of hucksters use their homes as their regular place of business and sell to customers living within a few miles' radius. They usually work four to six days per week and the majority have helpers (family members or hired labor). Hucksters handle an estimated 65 percent of the food sold in St. Vincent. A recent survey (Systems Group of Companies) indicated that fruits and vegetables account for 80 percent of their trade (about 40% each) and other products account for the remaining 20 percent.

Traffickers usually purchase products from farmers for export to other countries. The important crops are root crops such as sweet potatoes, yams, tannias, eddoes, and some fruits such as plantain, mangoes and grapefruit. Traffickers usually buy from several farmers and do little or no packaging before shipment. Schooners and ships are the methods used to transport products to export locations, mainly Barbados and Trinidad, but sometimes to Union Island and Grenada.

It takes about two to three days from the time products are shipped until they reach the export point. Many traffickers purchase cosmetics and clothes from the export location and bring them to sell in St. Vincent. It is common for traffickers to have other jobs such as farming or merchandizing. Many use paid helpers at the port. Credit from family or commercial banks may be used to operate the business.

Producer associations perform marketing functions for two important export crops, arrowroot and bananas. Growers of arrowroot deliver the rhizomes to processing plants owned by the Arrowroot Industry Association. This organization controls the export marketing of arrowroot products. Bananas are delivered by growers to a grading and boxing facility (many farmers pack the fruit in the field). The St. Vincent Banana Growers' Association is responsible for the sale of the bananas to Geest Industries Limited of the United Kingdom, the sole buyer.

Tobacco is grown under contract with the West Indian Tobacco Company, Limited. The bales are delivered to the company's purchasing center in St. Vincent and payment is made based on the grade of the leaf. It is then exported to the company's cleaning and classifying plant in Trinidad.

The Port Authority or the Customs Office collect duties on the nation's imports and exports. All food imports except chicken wings and backs are assessed duties which range from 10 percent to 30 percent of their value. Duty rates are set by the tariff regulations of the Eastern Caribbean Common Market (ECCM). In addition, the GOSV has set a stamp duty on food imports which is equal to 7 1/2 percent of the CIF (cost, insurance and freight) value of the goods. A consumption tax is also assigned to selected food imports.

Agricultural inputs such as seed, fertilizer, pesticides, medicines, tools, and machinery are allowed to enter St. Vincent free of duty. They are assessed a nominal stamp duty of EC$ 1.00 per entry.

Export duties are minimal. A tax of three percent of the FOB value is charged for bananas, ginger, and arrowroot exports. Exporters of whole coconuts are charged three cents (E.C.) per nut.

I. LAND DISTRIBUTION AND LAND TENURE

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 78 percent of the cultivated land. In other words, most of the farmers in St. Vincent are small farmers, but the majority of agricultural land is in either private or governmental estates. Of the five government estates, two are undergoing a redistribution and settlement scheme. The Lauders Estate on the Windward is now cultivated by about 500 farmers and the Richmond Vale Estate in the North Leeward has been subdivided into some 80 farms of five acres each. The lands are being leased for 30-year periods.

Land tenure in St. Vincent is interrelated with both farm efficiency and geographic location. A land tenure map would roughly show large private and government estates on the coastal, more gently sloping areas with rental and share tenancy on small holdings in the interior, more rugged boundaries of the estates. Portions of the mountainous interior crown lands are occupied by squatters. Own-account or family lands are found throughout St. Vincent and the Grenadines. The own-account small farmers are reported to make the most efficient use of the resources available to them. Estate farms which depend heavily on hired labor are generally less efficient as are the various forms of rental or share tenancy holdings. According to the 1972 census, the greatest proportion of holdings were owned (68%), followed by rent free (13%), cash rental (10%), mixed tenure (3%) and share tenancy (4%). Table XII shows the number of holdings and total acreage by various forms of tenure for 1972.

TABLE XII

NUMBER AND AREA OF HOLDINGS BY TENURE

Number of Holdings	0-	1-	5-	10-	50-	100+	Total Acres
Owned	2,187	2,002	445	160	10	26	4,830
Cash Rental	316	335	38	-	-	-	689
Rent Free	467	436	32	5	-	-	940
Share Tenancy	41	158	35	15	-	-	250
Mixed Tenure	21	240	109	9	-	-	379
Area of Holdings(Acres)							
Owned	883	4,410	2,755	2,716	712	17,801	29,277
Cash Rental	154	662	218	-	-	-	1,034
Rent Free	249	839	173	54	-	-	1,315
Share Tenancy	10	253	190	192	-	606	1,251
Mixed Tenure	21	600	727	130	-	-	1,478

SOURCE: Census of Agriculture, 1972/73, p. 40-41.

The owned land is frequently family land with an ambilineal inheritance pattern Informal agreements are the rule - lands are divided according to the number in the family interested in farming, but parcels move frequently among family members because of fluctuation between farming and non-farming occupations and the high incidence of both short and long-term emigration.

In cash rental tenancy, the farmer pays a set amount per acre per year for use of the land. The Government is currently using this form of tenancy in the distribution of government estate lands. In share tenancy, the land owner receives a set proportion (usually 1/3 or 1/2) of each harvest. Seeds and input costs are either shared by the landowner and the farmer or borne by the farmer. Private estate and large farmers are the most frequent utilizers of share tenancy.

Rent free tenancy refers to arrangements between the land owner and tenant whereby the tenant has use of a portion of land, but must vacate it upon demand of the land owner. The tenant is sometimes expected to share the crops he or she grows with the owner but no proportion is stipulated. Rent free tenancy is frequently used by the owner to keep land worked until he or she can take control of the production.

In mixed tenure arrangements, some mixture of the various forms of tenancy is agreed upon. For instance, the tenant may both pay a set rental fee and give the landlord some of the harvested crops.

Farming is most often combined with other pursuits and income sources whether from work or overseas remittances. A large proportion (up to 44% in some estimates) of the labor force is female. According to the 1972/73 census, 30 percent of all farm operators were women. Women also provide most of the private marketing services. Any program of assistance to agriculture in St. Vincent must recognize that women are the primary decision makers in the majority of rural households and significant participants in the country's agriculture.

II. PRIMARY CONSTRAINTS TO AGRICULTURAL DEVELOPMENT

Before analyzing various constraints, it is useful to understand two fundamental problems which 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. Unfortunately, there is little data available to document this argument. Support for the argument 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.

One might argue that the carrot production problem was solely attributable to nematode damage. No doubt there is substantial truth in that but several farmers when asked about why they had decreased carrot production, replied that they could have dealt with the nematode problem if the price of carrots had been more favorable.

Another indication of the high cost nature of Vincentian agriculture is shown by the relatively low importance of land in cost of production studies. In principle, the contribution of land to production is reflected in the land rental charges. If non-land costs comprise the major portion of the cost of production, the land resources provides primarily only the site and space for agricultural

production with non-land inputs being required to carry the major burden of production. This is the St. Vincent case. Cost of production studies for seven crops, prepared by the Agricultural Statistics Unit, show that land, on the average, accounted for only 1.3 percent of the cost of production. In highly productive low cost agriculture, land often accounts for 30 percent or more of the cost of production.

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. Again, specific data for documentation of these assertions are needed but not easily available. 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 fundamental solutions to this problem of high per unit cost of production and distribution are to:

1. develop research capacity to produce new technologies tailored to St. Vincent conditions which can increase yields of crops and livestock, such as new high yielding varieties, improved agronomic practices, better nutrition and breeding of livestock;
2. specialization in crops and livestock where comparative advantages exist relative to goods being imported and countries competing with St. Vincent for export markets;
3. development of arrangements whereby assembly and transport costs can be reduced such as through improved and expanded roads and fewer assembly points for the private market to accumulate marketed surpluses;

4. development of improved data and information systems which allow important analysis to be accomplished and which transmit market prices and information much quicker to all market participants.

The second 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 in Table XIII. Peanut, ginger, carrot and sweet potato production changed, from one year to the next, on the average of 39 percent or more. These very large changes in annual production also indicate that farmers are either actively searching for profitable crops or facing large price variations or experiencing substantial productions risks such as disease or natural disasters.

The results of high risk agriculture are lower productivity, wide diversity of production when possible, decreased ability to meet commitments on future deliveries, and a reluctance of market intermediaries to hold title to large quantities of produce.

Major ways to reduce risks in marketing are to:

1. develop more efficient and rapid information systems;
2. develop contractual arrangements with final buyers, market intermediaries, and farmers; and
3. implement insurance schemes and guarantees on prices.

TABLE *XIII*

ESTIMATED PRODUCTION OF SELECTED COMMODITIES

(1,000 LBS)

COMMODITY	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	Average Annual Percent Change
Sweet Potatoes	8,000	6,400	6,000	5,000	3,600	4,709	1,619	3,493	3,200	4,652	3,017	39
Yams, Tannias, Eddoes, Dasheen	6,500	7,150	8,300	5,100	3,800	4,365	3,722	6,895	6,798	7,531	7,029 a)	23
Arrowroot Starch	1,309	1,743	2,100	1,792	1,745	1,744	1,838	1,863	1,542	2,000	1,500	15
Bananas	71,104	64,044	63,855	51,823	42,938	69,269	63,095	71,934	63,028	46,145	73,240	23
Carrots	-	-	-	1,800	1,300	1,820	758	904	638	900	400	39
Ginger	-	-	-	700	2,600	1,749	1,255	1,915	2,635	1,200	N.A	79
Peanuts	-	-	-	170	210	147	45	151	101	100	400	96

SOURCE: 1971-1979 data, Table VII.1, p.32, Digest of Statistics for the year 1979, No. 29, Statistical Unit, St. Vincent and the Grenadines. 1980-1981 data from Agricultural Statistics Unit, Ministry of Trade and Agriculture.

a) exclude yams and tannias.

Many of the solutions to these problems require sustained and long-term investment as well as improved human capital. Unfortunately, results of solid developmental, adaptive and farm level research may not be highly visible in one or two years after initiation. Likewise, efforts to reduce risks may not provide benefits quickly until farmers and market participants begin to believe risks are indeed lowered. While not quick solutions, improved research, data generation systems, information systems, and improved human capital are fundamental to making any agriculture competitive in the long term.

A. MARKETING CONSTRAINTS

During our extensive interviews, the "Marketing Problem" was by far the constraint on agricultural development most frequently mentioned by government personnel, private businessmen, and farmers. The marketing problem can be broken into two related parts. The first deals with the process of price formation and the subsequent transmission of price information. From year to year prices should serve as a guide to farmers, especially at planting time, to indicate the relative profitability of various crops. Within a season, especially at harvest time, prices should serve to aid the decision of when to harvest and market, if at all. Price formation and transmission is essentially a social process. Although the process is not well understood, there is general agreement that the price formation and transmission system performs poorly in its role of matching production and consumption, both within a given season and from year to year. This poor performance is a major source of risk in Vincentian agriculture.

A second set of marketing problems deals with the physical movements of the crop from the farm gate to the consumer. This set includes problems of transportation, processing, grading, packaging, and storage. In contrast to the price formation process, improvements in this part of the marketing system will require

technical inputs and capital investments, with less relative emphasis on accompanying institutional arrangements. Improvements in price formation and transmission will require changes in customs on the part of the various participants in the market as well as some institutional innovation. The technical support component will be moderate.

The precise meaning of the "marketing problem" also depends importantly on the commodity in question. After discussing constraints common to most products, we treat the two major extra-regional, export crops, bananas and arrowroot. Finally, we turn to crops that are purchased for domestic consumption and also mainly exported to countries within the region.

Marketing Constraints Common to All Commodities

The terrain and existing road system impose a severe handicap on the movement of crops from farm to market. This problem is compounded by the highly diversified pattern of crop production. The per-unit costs of assembly are high because of the low volumes and scattered location of the individual crops. Further, the use of mini-vans in place of the larger vehicles with more space for produce, has made the transport of inputs and goods more difficult. The mini-van service is, however, considerably more frequent than the previous system, and arrangements are being made by some farmers for the transport of goods during low passenger hours.

Inter-island and extra-regional transport of agricultural products is primarily through shipping. Problems concerning handling and storage of produce on the ships reduce commodity quality. Storage and warehousing also appears to be a constraint on the orderly flow of products through the marketing channels.

The above constraints are, in a sense, only symptoms of the more fundamental problem of the pervasive uncertainty about foreign markets. Although the responsibility for seeking these markets rests with a number of groups, depending on

the commodity, they show in common the problems of being able to offer only a small volume, relative to other sources and a supply that often has year-to-year and within-season fluctuations. The presence of contracts with importing countries might contribute to production responses of farmers which would be more stable.

Marketing Constraints for Primary Extra-Regional Export Markets

Bananas

The need for maintenance of the protected U.K. market is important, but even higher prices are necessary to induce farmers to improve yields. Yields are now about six tons/acre and could be 10-15 tons/acre. The level of price is the key determinant. Although there is long term price uncertainty related to maintenance of the protected market, there is little within-season price uncertainty. Prices are announced weekly and often stay the same for several months.

If St. Vincent bananas were to lose their protected market, they would be unable to compete on the open market with the high yields, volume, and quality of bananas from Central and South America.

Arrowroot

The uncertainty about the competitive position of arrowroot starch in foreign markets is a constraint on the incentive to invest in upgrading several arrowroot starch factories, which are inefficiently operating. Although the technical quality of arrowroot starch is high there is now a question as to whether other sources (e.g., Brazil) will reduce the market share for the St. Vincent product. Technical developments in modifying other products to fill the present end uses of arrowroot starch may reduce its uniqueness. It will require aggressive negotiations with purchasing agents coupled with cost-reducing technology, both in production and processing, for St. Vincent to compete in a dynamic, rapidly-changing market.

Marketing Constraints for Commodities Sold In Intra-Regional Export and Domestic Markets

The principal purchasers of most of these commodities are hucksters and the Marketing Corporation. Partly because the individual pricing transaction between farmers and the hucksters at any one point in time are spatially separated, there is a good deal of variation in the resulting prices over space. However, hucksters often offer a higher price at the farm gate than the Marketing Corporation does at the depot. This makes it difficult for the Marketing Corporation to fulfill commitments for exports that it may have made. Attempts to provide a more certain supply with contracts betwen farmers and the Marketing Corporation have not been successful.

Although the lack of clear price signals to guide farmers both in their within-season marketing decision and in their planting decisions may have some of its origin in the importing countries, the present system of price formation within St. Vincent adds to the distortion and confusion. Gluts may occur even in products grown primarily for the domestic market. The "glut" phenomenon appears to involve irrational behavior on the part of the producers and market persons. It was reported that rather than take a low price for a commodity, even after it had been taken to the market, farmers would dispose of their produce in some other way than selling it. Thus, they in effect would get a substantially lower per-unit price for their total delivery. Although this may seem irrational, they perhaps expect that their actions will establish a pattern of higher prices in the long term and thus eventually they would benefit.

It was also reported that sellers in the wholesale and retail fresh produce market would maintain relatively high minimum prices for produce that was obviously in excess supply. Again, it was indicated that sellers did not want to set a precedent of lower prices.

The "gluts" have not been precisely defined, but following is an incomplete list of their occurrences and consequences:

Major Recorded Gluts

Crops	Year	Disposition
Sweet potatoes	1974/1976	Price reduced, more went to animal feed
Ginger	1974	Left in field
Tomatoes	1976	Reduction in price, rotted
Peppers	1973/1974	Rotted
Grapefruit	Almost every year	Spoiled
Mangoes	Almost every year	Spoiled

Lack of storage was often cited as an important constraint in marketing. Storage provides one means for reducing the temporary, within-season divergences between the supply and demand. Several different kinds of storage are lacking. One is the facilities for rather short-term storage which would take care of accumulations between, for example, the weekly arrival of ships. Another is the longer-term storage facilities which would serve both the export and domestic markets. Many of the starch root crops could be stored at reasonably low cost and yet retain the major part of their nutrient values. One of the advantages of using this type of storage, as compared to processing, is that the product is similar to the fresh crop and would thus be in a more readily acceptable form. Storage is also likely to be less expensive than processing, when considered from a nutritional viewpoint.

Establishment of processing facilities for food crops which rely on a lowering of prices when gluts occur on a disorganized fresh market is faced with substantial risk. The supply, quality and prices fluctuate widely as farmers aim for the higher paying fresh market and try to avoid saturating it. A well organized fully-developed fresh market can lower and stabilize prices paid by consumers and raise the income of producers by reducing the risks involved for producers and distributors. It is important that the opportunities be exploited

for reorganizing the fresh market for local demand before processing is given substantial emphasis.

Loss of quality through improper handling is also a constraint in the marketing process. These losses often begin at harvesting time when the fruits or vegetables may be bruised or cut. Also the containers and vehicles used to transport the products to the market may add to the injuries and subsequent spoilage. These losses in quality vary from crop to crop but are substantial in the aggregate.

Related to the quality problem is the constraint of the lack of grading systems for most crops. This increases the transaction cost in that traders must inspect individual lots and negotiate prices on a lot-by-lot basis. This reduces the volume that can be handled by individual traders. Further, a grading system with appropriate price differentials would provide additional incentives to farmers and others to improve quality and reduce post-harvest losses.

Two institutional problems are also important in understanding marketing constraints. The marketing organization faces problems which do not allow it to perform as envisioned. One major problem relates to the lack of data and other information on current or prospective production of agricultural commodities. While criticism has been made at the lack of agressiveness in finding export markets, the task of making future commitments on delivery of produce at certain prices is risky and difficult in the current situation where little information is available or regularity observed. Also, set prices made by the Agricultural Marketing Protocol may not allow the Marketing Corporation to pay farmers prices which will provide adequate incentive to produce quantities needed. Even if they do produce these quantities, hucksters and traffickers may outbid them for products which are to be shipped under a contract agreement. The current extension of efforts to food retailing may have diverted important scarce management skills from achieving the agricultural product export and farm input import objectives.

As market information and organization improves, the role of the Marketing Corporation may become less important.

The AMP under CARICOM has encountered operational difficulties and under present conditions, may not be facilitating marketing as desired. The agreement covers a large number of fresh produce items including peanuts, tomatoes, carrots and sweet potatoes. Under the agreement the CARICOM countries are to identify deficits and surpluses in the various countries and agree on prices that have a cost-of-production base.

It would be difficult for these prices to reflect supply/demand conditions at time of delivery and cost-of-production levels in St. Vincent. As previously stated, Marketing Corporation has frequently found itself in the position of not being able to compete with the hucksters and thus not able to fulfill its quota under the AMP agreement.

Pricing, import and export policies can contribute to marketing problems. In this case, minimal export duties do not appear to constrain agricultural production or marketing. Also, most agricultural inputs are imported duty-free.

Maximum prices are controlled on some agricultural products which limit incentives for increased production. Various milk products have price controls which probably reflect consumer protection interests since some imported milk products are denied entry.

Chicken meat, fish and beef also have price ceilings or fixed prices. Also onions, fruit juices, sugar, copra, flour and bread appear to be other local products which have price controls.

The administrative effectiveness of these regulations has been questioned. To the extent they are effectively administered or perceived to be effective by producers and marketers, they can limit production incentives and further development of that commodity. Whether this actually occurs is difficult to ascertain given the available information and analyses.

B. PLANNING, PROGRAMMING, AND IMPLEMENTATION CONSTRAINTS

The low capacity for agricultural planning and program design and implementation is a major constraint to a more cohesive and productive agricultural sector in St. Vincent. There is no effective mechanism for development of an overall agricultural plan to guide programs or projects which develop indigenously or externally. Little reliable information is available upon which to base planning because an effective data collection system has not been established. The lack of training inhibits program planning and implementation at the administrative, technical, and skilled worker levels.

Inadequate physical facilities and equipment also constrain the efforts which are made to plan and carry out agricultural projects. Insufficient transportation and communication facilities remain barriers to the implementation of ideas and achievement of planned objectives. The problems associated with program coordination and planning, data acquisition, knowledge utilization, and adequate equipment and physical facilities must be addressed to facilitate realizing proposed agricultural development objectives. Many of these problems stem from a lack of recurrent and capital resources. What budget is available is utilized for projects or personnel within units. An organizational chart of the MTA is shown in Chart I.

Planning Programs and Implementation Mechanisms

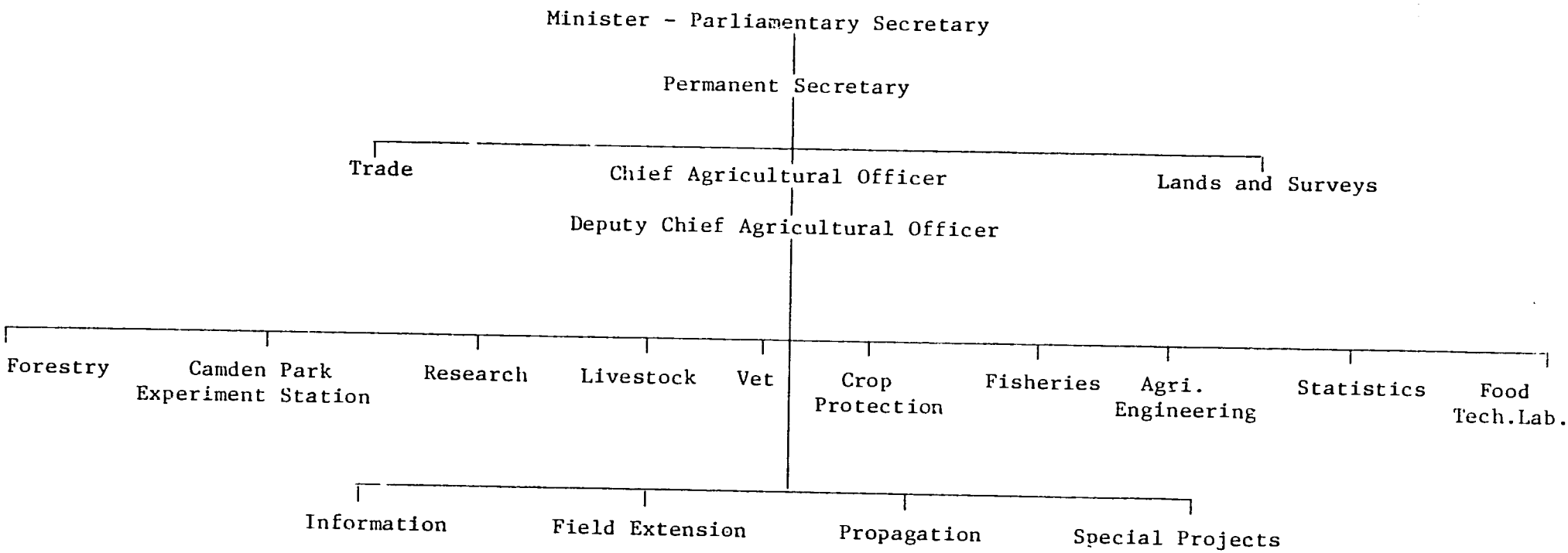
Program planning includes problem identification, collection and analysis of data, policy and strategy formation, establishment of priorities, and project implementation and evaluation. The lack of organized agricultural planning which includes clear objectives, priorities and strategies is a major constraint in obtaining and utilizing resources for providing more and higher quality services to agriculture in St. Vincent.

Chart I

ORGANIZATIONAL CHART

THE MINISTRY OF TRADE AND AGRICULTURE

St. Vincent, 1981



Regardless of one's philosophy regarding planning in agriculture, the government of St. Vincent will be involved in the implementation of an increasing number of agricultural projects in the years to come. As Table XIV shows, agricultural assistance totaled at over 24 million dollars (U.S.) is being requested in the form of varied projects for the 1981/82 - 84/85 period. An increased program planning capability would assist the St. Vincent government to more productively utilize this significant amount of external assistance.

No individual is responsible for continuous attention to agricultural planning and project implementation. Nationals are concerned that their planning is more a function of what donor agencies are prepared to finance. Donor agencies assert that government requests are frequently project-oriented shopping lists without linkage to any overall plan or strategy for accomplishing goals. Coordinated planning through an effective process would assist in reaching the following objectives:

1. Efficient use of the country's scarce resources through avoiding projects that are oriented to conflicting objectives;
2. Avoiding over-extension of government service units by providing a rationale for additional personnel and facilities for the units because of the varied demands placed upon the units by donor agency/GOSV projects. For example, the MTA Veterinary staff is already overcommitted in meeting the needs of Vincentian farmers, but is also expected to service the increasing Diamond Dairy herd and the animals in the livestock centers.
3. Budgeted use of the country's technical experts in program development, implementation and evaluation. Technical experts external to St. Vincent now play a relatively large role in the development of programs funded by donor agencies. This occurs partly through the lack of identification and use of appropriate, capable local people and partly because the country's technical experts are expected to donate their time and ideas free of cost while maintaining their regular work. The budgeted use of local experts in project development, implementation, and evaluation should be of benefit to projects through:

TABLE XIV

ST. VINCENT - MAJOR NEW DEVELOPMENT PROJECTS IN AGRICULTURE AND SOURCES OF FUNDING - FY 1981/82 - 1984/85

Project Title	Total Cost (U.S.$)	Source	Planned Implementation Schedule 82/83	84/85	84/85	Post 84/85
Banana Development Program	740	UK, UNK*	185	259	296	-
Coconut Development Program	500	UNK	-	176	222	102
Integrated Crop Diversification	1,000	CDB, UNK	75	250	350	325
Product Storage Facilities	800	CIDA, CDB	-	280	320	200
Agriculture Extension & Research	800	UNK, USAID	-	200	280	320
Agriculture Credit	2,000	CDB, UNK	-	100	200	1,700
Development of Livestock Industry II	700	CIDA, UNK	-	137	245	318
Development of Fisheries Industry	3,000	FAO, UNK	-	-	200	1,800
Integrated Arrowroot Development	2,050	CDB	256	717	717	360
Development of AGRO Industry I	600	Trinidad, UNK	-	137	304	159
Improvement of Sugar Factory	800	UNK	-	300	361	139
Feeder and Rural Roads	11,200	UNK	-	370	926	9,904
Soil and Water Conservation	1,00	UNDP, UNK	-	200	200	600
TOTAL:	24,190		516	3,126	4,621	15,927

*UNK = Unknown

SOURCE: Economic Memorandum on St. Vincent and the Grenadines. World Bank Report No. 3817-CRG, April 20, 1982.

a. reduction of project cost,
b. more efficient work by people familiar with the country, and
c. increased long-term commitment to project goals.

4. Coordination of internal request proposals and external assistance opportunities.
5. Communication and coordination with other agricultural institutions in St. Vincent and with the Central Planning Unit. These bonds need strengthening for the coordination of activities and to utilize combined expertise. In some cases, the resources are in place, but remain untapped.

The BHN USAID Project demonstrated that a central organizer/supervisor can be beneficial to project operation. The project manager monitored five BHN projects and assisted in organizing, implementing and gathering records and reports. We were told the projects were successful be ause objectives and strategies were clear and straightforward and the management was localized and competent. In contrast, failure of other projects is generally blamed on poor planning, obscure objectives and methods, poor management and complexity.

Documentation and Data Collection

Documentation and data pertaining to agricultural operations in St. Vincent are generally limited to studies with small sample sizes. As stated by one MTA official, "In a small country like this, it is relatively expensive to get scientific data. We don't have man power, facilities, or training. We would like to see the data as up-to-date as possible, but that's difficult to do." 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 very little information on their transactions. Farmers

to institutional managers see little need for records and consequently attach little importance to data-gathering procedures.

Economic, physical facility and training constraints also 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.

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. Currrently 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 can't even estimate what the possiblilities are." There is no complete list of farmers or fishermen. The last agricultural survey was done in 1971-72 and 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, to provide appropriate technology packages to the farmer, etc. While CARDI's work and the ad hoc collection of data by various studies and projects are useful, these efforts are not sufficient for effective planning. Minimum data needs should be determined so that a data collection system can be established and maintained.

Training Constraints

Training is integrally linked with program planning, documentation, and implementation. Currently, the few trained Vincentians are over extended by demands for their expertise and abilities. Valued because of their training and

experience, these personnel are repeatedly called upon to serve on committees, to lecture at workshop and seminars, or to provide their services in some way without remuneration or release-time from demands of their regular jobs. The absence of technical expertise in areas such as plant protection means that personnel involved in such activities can only carry out a minimal service. Even with technical expertise in place, many projects run into implementation difficulties because people are not trained in skills such as machinery operation or maintenance. Training must also occur on administrative, technical and skill levels for optimal program planning and implementation.

Training and expertise in planning and policy formation, project preparation, and implementation management is necessary for organizing and implementing an agricultural development strategy in St. Vincent. Such training is also necessary for the country to overcome the colonial heritage of dependency on exogenous bodies for planning and program implementation. With adequate training in program and project formation and management, personnel in the MTA could organize their priorities, making requests for donor agency assistance where needed and thereby cease to react only to donors' desires. In addition, training in project preparation would facilitate the procurement of funds since many projects remain unassisted because proposals are submitted that are frequently in the form of lists without stated objectives, strategies, rationale, or justifications.

Technical experts in agriculture must be available for both the development and implementation of plans. If the technical expertise is not present, there is little rationale for upgrading educational and service units. For instance, in the MTA, neither the Crop Protection Unit nor the Forestry Unit have access to the expertise of anyone with more than diploma-level training. The Statistics Unit is headed by a temporary resident, but no provisions have been made to formally train someone to replace her when she leaves. MTA staff have indicated interest in formal technical education, but training beyond the two-year diploma level is not supported by the Ministry.

Non-formal short courses or on-the-job skill training is a necessary part of implementation of plans. Training needs mentioned by Vincentians interviewed include skill in machinery maintenance and operation, forest management, use of fishing technology, soil conservation and the handling, packaging, processing and storage of produce. In many cases, skill training is not simply a matter of developing training programs for the farmer or fisherman, but one of training the extension-type worker as well.

Physical Facilities and Equipment

Physical facilities and equipment are necessary for both project planning and implementation. For instance, the Plant Protection Unit's officers must occupy an office filled with the fumes of the chemicals stored in an adjacent room. When asked their needs, they naturally think in terms of better office or storage space rather than assistance in developing a systematic spraying plan or educational seminars. Even if well structured plans are made, they cannot be carried out if the appropriate equipment and access to transportation are not available.

As a whole, the physical facilities of the MTA are poor. The Ministry building is congested. The various units within the MTA have inadequate operating and storage space. For example, a room approximately 10' by 10' houses both the Fisheries Unit (2 people), the Home Economics Unit (1 person) and an agricultural officer. In particular, the Crop Protection, Fisheries, Home Economics, Information, and Veterinary Units need physical facilities which would assist them to become more effective in planning and implementing programs.

If, as part of an agricultural project, technical assistance is required, there is literally no place for an additional person to sit other than in the conference room. The conference room does not have a sufficient supply of chairs to seat the agricultural staff who meet there monthly. An overhead fan would also help to make conditions more tolerable during crowded meetings.

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 instance, the fisheries officers are hard pressed to make plans when they have no means for data collection concerning the fishing potential in the Vincentian waters, no equipment for demonstration seminars and workshops for fishermen, and no boat for transportation into the Grenadines where much of the fishing occurs. For 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 4-wheel drive vehicles or by foot, the work done by the MTA staff is limited both geographically and by time.

Good physical facilities provide an atmosphere conducive to making plans, analyzing data, and keeping records pertaining to one's work. Appropriate facilities also provide a space for communication of ideas in the form of discussions, seminars, and workshops. Adequate appropriate equipment is necessary for implementing plans whether they be service, educational, or regulatory. The Caribbean Agricultural Extension Project (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.

C. PRODUCTION SUPPORT SYSTEM CONSTRAINTS

If St. Vincent agriculture (including forestry, fisheries, and livestock) is to develop into a long-term, economically viable sector, the critical role of the input support system and its current deficiences must be recognized. The demands on this support system are especially high because of the diversified nature of St. Vincent agriculture. This diversification is, in part, a response to the uncertainty of export markets, but it also reflects the need to provide variety in the domestic diets of both farmers and non-farmers. With a diversified agriculture there is limited opportunity to develop support systems that have scale economies from specialization. Further, there is a continuing trial-and-error search for crops that can be profitably exported and this adds a dynamic feature to the pattern of diversification and introduces further stress into the production support system.

Even if export market uncertainty were to be substantially reduced, the need for an economically efficient support system for the primary production units (farms) remains. The potential production cost savings that can accrue with an improved production support system must be realized if St. Vincent agriculture is, over the long-term, to survive.

The constraints on the production support system are viewed in two time frames. The first set contains those that are currently a problem and that do not depend critically on the development of new technology that is presently known and also the conservation of the productivity of St. Vincent's soil resource.

Current Production Support System Constraints

Agricultural Finance

The ease with which farmers gain control of the economically productive inputs, including land, is determined in large part by the institutional arrangements for agricultural credit. The lack of a well-developed system for the sharing of

the risks involved in lending funds for inputs is an important deficiency in the present system. For example, a government policy of artificially low interest rates may prevent the lending agency from providing the necessary supervision to reduce the risks. The collateral requirement for starting farmers is an impediment to achieving the announced policy of encouraging small farmers. Again, the collateral requirement represents a response on the part of the lenders to the riskiness involved in lending to this group. No doubt some farmers are denied loans based on an accurate appraisal of their capacity to repay. Nevertheless, the delays and "red tape" involved in processing loan requests, especially small ones, seem to add unneccesarily to the social cost of credit. There is scope for improvement in the agricultural finance system by revising the roles of the various public and private institutions in moving toward an economically rational structure in which the borrowers pay full cost for the available funds but with this cost being reduced because of the lower risks that result with supervised management and more careful preparation of plans by farmers. This activity might be undertaken by the public sector. The advantages and disadvantages of a single source of loans to farmers, for all purposes, consumption and production, need to be assessed. In a small agricultural economy the scope for gains from specialization by purpose of loan may have been overestimated.

Accessibility of Fertilizer, Pesticides, Planting Materials, Seeds, Animal Health Services, Plant Protection Services, and Hand Tools.

The term "accessibility" has two inter-related aspects. Is the input or service actually available, either for purchase or through a subsidized program? Is the input or service available, but priced so high that its purchase cannot be economically justified? There is the added cost of transporting the inputs from the point of availability to the farm (or taking an animal to the diagnostic clinic). Thus, the difficulties of distance and road conditions add substantially to the total resources required for agricultural production.

There is a lack of regular availability of seed, planting materials, tools, pesticides, and fertilizers, especially by small farmers producing tree crops, ground provisions, and vegetables. This results in reduced production and/or quality due to disease, insects, and rats. In this connection, the facilities of the plant protection unit and the level of training of plant protection personnel are clearly inadequate for the scope of the crop pest problems, both current and potential. In a parallel vein, the animal health capability is severely limited by lack of trained personnel, equipment, vehicles and facilities. At present there is limited capacity to respond to a disease outbreak. For some time to come, it is not reasonable to expect that the private sector will provide these much needed services for plant protection and animal health.

The main suppliers of fertilizers, chemicals, and seeds include the commodity associations and the Marketing Corporation. There are also, several small private firms handling farm inputs. At least some of the fertilizer imported under the auspices of WINBAN and distributed by the Banana Growers' Association is used on other crops. The mixed fertilizer used on bananas may or may not be appropriate for use on other crops. Hence, production costs per unit might be reduced by having a wider range of formulas available. In general, the fertilizer costs borne by farmers do not contain subsidies. There is indication that input supplies from the above channels are inadequate and that there is substantial importation of farm supplies, particularly seeds, by hucksters for sale to farmers.

Although the sale of seed is one of the functions of the Marketing Corporation, there are reports of irregularity or unavailability. The seed sales by the Marketing Corporation are subsidized and this part of their operation incurs a loss. After an initial period of low-cost seed to stimulate production of a new crop, there seems little reason to introduce distortions in the input price structure.

Water as a Support System Constraint

Approximately 70 percent of the total annual rainfall is received between May and November. During the remainder of the year there is a potential for increasing crop production by the introduction of irrigation. There are currently about 500 acres under irrigation and these are concentrated on the larger farms. Increased availability of water for irrigation would reduce the seasonal fluctuations in production and also increase the employment, both on-farm and off-farm, during the dry season. Availability of irrigation water may also provide a type of "insurance" to cope with the year-to-year fluctuations in rainfall during the growing season.

The present constraint in water for irrigation is partly technical and partly institutional. There needs to be a careful study of those crops and areas within the country that are most likely to provide an economically justifiable response to investment in irrigation. Clearly, the nature of the terrain and access to reliable streams are factors that need to be taken into account.

On the institutional side, there is a need for organizing a system for sharing costs and the allocation of water among farms, including the critical aspect of the timing of such allocation within a given season. There does not appear to be an organization presently in place that could perform these functions. If the small farmers are to share in the potential benefits from irrigation, it is essential that the institutional arrangements for water distribution and cost sharing be developed along with the technical aspects.

Longer-Term Production Support System Constraints

Development of Improved Site-Specific Technology for St. Vincent

In the longer-term, attention must be directed not only to the delivery system for the inputs that characterize the presently known technology, but also to that part of the support system that generates new technology that will reduce

the resources required per unit of agricultural output. It is difficult to assess the changes in the productivity of St. Vincent agriculture over reasonably long periods. Reliable data on the amount of land and labor actually used in production are not available. The St. Vincent National Agricultural Program (S.N.A.P.) indicated a mixed pattern of crop yield per acre changes from 1961 to 1972-73; some crops yields increased and some decreased. There was no compelling evidence of increasing crop yields during that period.

Further clues about the lack of increasing productivity in the agricultural sector may be obtained by comparing average 1966-1969 production with the average 1975-1978 production for a number of key crops. Based on data in the S.N.A.P. report and the Digest of Statistics for the year 1979 (No. 29), published by the Statistical Unit, we note the following declines in total production:

	Percent Change 1966-1969 to 1975-1978
Sweet potatoes, yams, tannias, eddoes and dasheen	-50%
Arrowroot starch	-47%
Bananas	-08%

Of course, these declines have been buffered to an unknown extent by increases in output of such crops as carrots, ginger, tobacco, peanuts, onions and others for which data for 1966-1969 are not available. Increase in these crops would need to have been substantial to offset the reductions noted in the above table.

To gain another perspective of the productivity of the agricultural sector, we relate the Gross Domestic Product (GDP) originating in agriculture to the total population:

Year	(1) Agricultural Contribution to GDP (Millions of 1976 EC$)	(2) Population	(1)/(2) Agricultural GDP per capita 1976 EC$
1975	11.0	99,643	110
1976	14.0	102,243	137
1977	11.5	103,946	111
1978	13.6	105,787	129
1979	10.2	107,723	95
1980	9.2	109,292	84

SOURCE: Tables 2.2 and 3.2 of Economic Memorandum on St. Vincent and the Grenadines, Report No. 3817-CRG, April 20, 1982. World Bank.

The low per-capita agricultural GDP in 1979 and 1980 are influenced by the eruption of La Soufriere in 1979 and Hurricane Allen in 1980. Data are not available on the fraction of the population engaged in agriculture. This information, together with a longer time series, is necessary to assess changes in labor productivity in agriculture.

The admittedly sketchy data base together with informal observations, leads to an impression of a rather stagnant agriculture in terms of technological change. The changes in technology that have occured have had an apparent adverse effect on the productivity of labor relative to other alternatives. The inability of farmers to offer a high enough wage rate to attract the needed labor was frequently reported. It is likely that the wage rate necessary to secure farm workers is influenced, at least in part, by off-farm opportunities and that the productivity of labor in agriculture is not sufficiently high to be attractive to potential farm workers.

We know that there is a considerable stock of unused technology that could increase the physical productivity of Vincentian agriculture. Even with substantial reductions in commodity market uncertainty and with improvements in input markets, economic incentives for adoption of the presently known and available technology may not be strong enough to provide a satisfactory rate of

increase in agriculture productivity. Consequently thought must be given to a more ultimate constraint - the lack of technologies that will clearly and substantially lower the resources required per unit of agricul..ral output in St. Vincent. The agricultural research and development capabilities needed to meet this more distant and less clearly perceived constraint are substantial and perhaps out of reach for a small independent nation. Innovative measures are needed to modify the present regional and national research systems to tailor development of new techn.'ogy more closely to St. Vincent agriculture.

Loss of Soil Productivity Through Excessive Soil Erosion

Although the losses in soil productivity due to erosion may not be extensive, it is important that the problem be recognized and that remedial action be taken in the interest of the long-term viability of St. Vincent agriculture. The reason that current productivity losses are not dramatic is that technology, such as fertilizer, may mask the yield losses that would otherwise be apparent.

There is a good deal of variation in the yield consequences of soil erosion on St. Vincent. For example, some of the most spectacular erosion occurs in recent volcanic ash. On soils formed over this material it is necessary only to control erosion to prevent off-site damage. Crops will grow well on the subsoil after organic matter is added. In other areas a marked drop in productivity occurs when crop production is practiced on the subsoils.

In the 1950's and 1960's, St. Vincent was cited as a leader in the public and private efforts to control soil erosion. The recently completed Basic Human Needs Project focussed almost exclusively on watershed areas in which there was little agricultural production. Although this location for conservation efforts is important and must be continued, cultivated areas also need attention. The economic incentives for adoption of soil conservation measures by the individual farmer are not strong. This is due, in part, to his/her shorter planning horizon.

Thus, the role of the public sector is an important one in maintaining the long-term productivity of one of St. Vincent's basic agricultural resources.

III. ACTIONS WHICH HAVE POTENTIAL FOR ALLEVIATION OF CONSTRAINTS

The large majority of agricultural enterprises in St. Vincent and the Grenadines are small and are, in part, a source of subsistence for the many farm households. At the same time, they contribute to total household income, which may stem from a variety of farm and non-farm sources, and represent a major source of employment for both small holders and other rural residents. Vincentian agriculture is inextricably linked with and must compete as part of a much larger and complex international agricultural production and distribution system. As a small element in the larger system it is highly vulnerable to externally induced shocks which have an impact on both imports and exports. Vincentian agriculture is also more vulnerable to the effects of natural disaster than is true for most countries, and is based on a terrain so rugged that extreme care must be taken to avoid destruction of the land base itself.

A small-scale and fragile commercial agricultural production system must be flexible to adapt to shocks and to capitalize on opportunities as they arise. In absence of substantial power in the market place, it must also be efficient in both production and marketing if it is to thrive in the larger system.

It follows from the preceding, that interventions aimed at assisting in the development process must be directed toward improved marketing and production efficiency, and toward building in a capacity for rapid and efficient adjustment to changing conditions. Ultimately, the crucial elements of productivity, efficiency, and adaptive flexibility hinge on investment in human capital. Effort must be directed toward improving the ability of the many small farmers and the many participants in the marketing system to make informed production and market decisions as well as toward improving access to the means to carry out those decisions. In the following sections, some options to consider in devising an agricultural development strategy are outlined.

A. AGRICULTURAL POLICY

Agricultural policy is clearly one of the critical elements in an overall development strategy.

Price policy is an important aspect of agricultural policy which affects all Vincentians - consumers and producers. The trade-offs between controlling inflationary pressures and providing incentives to producers are difficult to decide upon, particularly where retail competition is limited. In cases like beef, where local production may not be expected to develop, price controls may make sense. For poultry and fish, however, price limits may well constrain local production. Further study and policy analysis may be needed in these cases.

The current policy on not participating in the program providing agricultural credit at commercial rates may well restrict the amount of credit available to farmers. Subsidized credit programs typically are not self-supporting and tend to ration credit administratively. If farmers can borrow at commercial rates and meet repayments, a commercial rate credit program will be self-sustained, draw less on scarce development capital, and ration credit by economic means. However, subsidized credit programs can be useful tools to assist low income farmers or promote certain commodity emphases. Some countries have required commercial banks to allocate a certain percent of their total loans to farm loans.

Policy measures designed to enhance the performance of traffickers and better integrate them into the total market system might be considered. Continuation and expansion of existing measures to distribute government land to small farmers should be seriously considered. Possible programs to consolidate fragmented holdings should also be considered and analyzed.

B. RURAL INFRASTRUCTURE DEVELOPMENT

Rural infrastructure development is a necessary element in an overall development stragegy. Feeder road extension, and road maintenance generally are important,

especially in St. vincent's Leeward and upper Windward areas as well as in the Grenadines.

Continued expansion of the impressive electrification program is also importan However, high electricity bills relative to household incomes for many households may suggest a need to seriously consider wind and solar energy generation options.

With respect to the Grenadines, water resource development should have high priority. The potential for irrigation in the dry season and in particularly productive but dryer areas of St. Vincent and the Grenadines, should be seriously evaluated.

C. TRAINING

Training, and more broadly, human capital development, represent pervasive needs in the development process. Farmers need information and skill training to improve production efficiency. They also need to better understand the marketing process. Participants in the marketing system need training to improve their ability to interact efficiently with other elements of the marketing system as well as better understand the constraints faced by producers. Farmers and marketers also need training in producing and maintaining quality of produce.

Improved management is critical in both marketing and production, and in the several institutions which provide information, services and technical advice to the agriculture sector. Training a general term, and can be thought of here in the broadest sense, from the enhancement of agricultural education in the school system, to focused "short courses" to "on-the-job" training, media campaigns and longer-term technical education.

D. AGRI-BUSINESS DEVELOPMENT

Agri-business development is still another of the many elements in a comprehensive development strategy. Improvement in the availability of purchased

production inputs (including implements) is obviously critical to the producer and his/her efficiency. Closer linkage with CATCO which proposes to buy agricultural inputs in bulk and provision of business credit to entrepreneurs will be important in this regard. Storage is a current, major constraint in the marketing process since perishables figure heavily in production output, and since prevailing quality standards must be met in competitive markets.

Agro-processing is another element frequently mentioned in discussions of Vincentian agriculture as having potential for further development. Development of processing facilities could enhance market prospects for Vincentian products as well as provide direct employment to an expanding labor force. Particularly promising possibilities seem to exist in seasonal fruit drink and fruit juice processing. If present plans to develop poultry production and expand peanut production are successful, processing of these commodities will also be major opportunities.

Finally, improved access to credit for producers, marketers and for businesses linked to the agricultural sector require continuing attention in the ever-changing context of agricultural development. Indeed, it may be the case that major funding, on soft terms, will be needed to achieve the kinds of structural adjustments and infrastructural development that is needed.

E. LAND REFORM

Land reform, in the broadest sense, represents another category of problems to be addresssed in a development strategy. Increasing fragmentation of holdings is a current problem in Vincentian agriculture. Consolidation of holdings raises many complex questions, as does the more general question of access to land for potential entrants to agriculture. Still more broadly, land use planning, in particular to address the potentially very serious problem of soil erosion, is needed. The first step is to obtain accurate information on the extent of the

problem and the changes occuring over time. Periodic aerial photography has excellent potential in this regard.

Finally, in the narrower sense of land reform, there still exists a considerable stock of land in government hands, some of which has potential for intensive exploitation, and which could be made available to the small farm sector. Current trends in underemployment and inability of many to buy reasonably productive land dictate that increased land redistribution from government owned estates be seriously considered. Providing needed support and infrastructure for the new land holders should be integrated with land reform programs.

F. APPROPRIATE TECHNOLOGY

Appropriate technology, access to the means for development of such technology and adaptation of the technology to local conditions, are major elements in a development strategy and represent critical needs in Vincentian agriculture. It is not likely that the agricultural economy of St. Vincent and the Grenadines can fully support the research needed to generate improved technology. Facilitating access to regional and extra-regional research entities can be realized, however, and adaptive work must be done at the local level in any case. Major productivity increases in a number of commodities appear to be possible under such a program. Fruits, vegetables, poultry, and small ruminants all have potential for improved yields so that farmers and consumers gain.

G. PLAN, IMPLEMENT, AND MONITOR THE PROGRESS OF DEVELOPMENT ACTIVITIES

Further development of the capacity to plan, implement, and monitor the progress of development activities is another necessary ingredient in a development strategy. The Ministry of Trade and Agriculture is, of course, central in such efforts, as is the Central Planning Unit. Coordination of effort between the MTA and the CPU is critical, as is coordination with related activities in the Development Corporation, CARDI, ORD, the Marketing Corporation, and other institutions.

H. ANALYTIC CAPACITY

Planning and program implementation cannot succeed without a substantial analytic capacity built into the relevant organizations, especially the MTA in this case. An agriculture which must be flexible to survive must have skilled analysis of external opportunities and prompt attention to internal problems, based on high quality and current information. An up-to-date census of agriculture could be mentioned here, as well as information on fishery resources, forest resources, and the current extent of soil erosion and lowered water tables. The point of focus here is the capacity to both generate and analyze information as an element in enhancing the adaptive capacity of Vincentian agriculture.

I. INFORMATION FLOW

Improvement of information flow is another important element in a development strategy. High quality information is largely useless unless it can flow smoothly among the institutions concerned with agriculture. Information flow improvement is needed particularly between the internal marketing and production sectors, about external market potentials, from agricultural institutions to farmers, and from the farmers to these institutions as well. Particularly needed is a method to anticipate commodity production well ahead of harvest to assist marketers in their activities. A sample survey crop outlook system is being used in a number of countries and might be adaptable to St. Vincent and the Grenadines.

J. FARMER, RURAL COMMUNITY OR INTEREST GROUP ORGANIZATIONS

Though no list of elements in an agricultural development strategy can be completely exhaustive, a final point to be mentioned is the further developmert of farmer and, more generally, rural community or interest group organizations. The existing grower associations are prime examples of the utility of organized means to reach producers with relevant information, coordinate action among growers, and

articulate the needs of growers to outside entities. Further development of both commodity and community based organizations would be extremely useful in achieving the kind of flexible and responsive posture that is essential if Vincentian agriculture is to thrive.

IV. AGRICULTURE PROGRAM STRATEGY FOR UTILIZATION OF USAID ASSISTANCE

A. GENERAL STRATEGY

Food 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, we are proposing an integrated approach.

The proposed approach has three elements. First, a small number of commodities with strong market potential are to be identified. The approach is thus strongly market oriented. Second, a procedure is to be set in motion to bring available technology and expertise to bear on the marketing and production of the selected commodities, and adapt the technology to local conditions. The objective of this procedure is to identify and begin to solve marketing problems, increase production, minimize per unit costs of marketing and production, and thus enhance net returns to the producer. Third, and finally, it is proposed that a program planning, implementation, and monitoring capability 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 the proposed 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 agricultural assistance to come (see Appendix V) and better anticipate, plan for, and manage needed projects in the coming years. For example, it is anticipated that this strengthening would allow a second phase of USAID agricultural assistance, if it occurs, to be largely identified and articulated by MTA and CPU personnel. It is thought, in other words, that the agricultural sector of St. Vincent and the Grenadines will have to maintain a flexible stance for long-run survival.

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, as well as peanuts and to a degree, sweet potatoes. 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 arrowroot production illustrates well the need for continuous adaptation to changing markets or other conditions.

B. SPECIFIC STRATEGY

The USAID assistance program during the first three years should focus on basic aspects relating to commodity production, the essentials of an adequate marketing system, and necessary support for related instituion building. We recommend a tightly integrated commodity-oriented development package for St. Vincent agriculture

Preliminary discussions, observations, familiarity with current technology and assessment of the existing production systems and market potentials have led us to recommend limiting the scope of any proposed activities to a few commodities. Specifically, initial program activities should be concerned only with those commodities which are judged to have the greatest potentials for increased production through currently available technology, have reasonably secure markets, and contribute to meeting important national objectives.

Commodity Justification

The traditional commodities of bananas, arrowroot and sugar which are grown by a large number of farmers and provide substantial foreign exchange earnings or savings, have not been chosen for emphasis by USAID assistance. Bananas and arrowroot have received and are receiving substantial attention from other donors. Arrowroot market prospects appear to be declining and the state of the world sugar economy indicates that expanding production of sugar above domestic needs would not be wise. In addition, GOSV development objectives include interests in diversifying the agricultural production base beyond these traditional commodities.

Based on the criteria outlined previously, the following commodities were identified and classified according to their maximum potentials, grouped by type:

	Extent of Emphasis	
Commodity by Group	Primary	Secondary
Fisheries	-	Salt/fresh water fish
Fruits	-	Citrus
Livestock & Products	Poultry	Sheep and goats
Vegetables	Peanuts, sweet potatoes, and carrots	Pigeon peas

Because of the complexity of the proposed program activities and the extensive concentrated efforts that would be required to successfully achieve the stated objectives, it will be necessary to limit the number of commodities to two to four.

The final selection of specific commodities as well as their number should be further investigated by the Project Paper (PP) team in coordination with the Ministry of Trade and Agriculture (MTA) and the Central Planning Unit.

While we identify the above eight commodities as those with the greatest potentials, the dynamic nature of domestic and international agriculture warrant a degree of flexibility. This should include the possibility of adding or removing

commodities from the above list and also shifting items from one priority level to another. This may occur during the Project Paper development process or during the implementation phase, as conditions and justification warrant.

As indicated earlier, justification for our selection of the specified eight commodities was based on a number of factors. Table XV presents a summary of the projected impact of an assistance program for each of the eight commodities.

TABLE XV

PROJECTED IMPACT OF RECOMMENDED ASSISTANCE PROGRAM ON SPECIFIC OBJECTIVES BY COMMODITY

Commodity/Group	Productivity Potential	Market Certainty	Rural Employment Maintenance	Farm Income Improvement	Foreign Exchange	Nutritio
Primary:						
Peanuts	H[1]	M	M	H	M	M
Sweet Potatoes	M	H	H	H	H	L
Carrots	H	H	H	H	H	M
Poultry	M	H	L	M	H	M
Secondary:						
Citrus	H	L	L	M	H	M
Pigeon Peas	H	M	M	M	M	M
Sheep/Goats	M	H	L	M	M	H
Fisheries	H	H	M	M	H	H

1. H, M, L = the projected impact of the recommended assistance program on the speci objectives is, respectively; high, medium, or low but significant.

Peanuts

Peanuts were selected because adapted technology and improved varieties recently introduced have increased yields in farmers' fields by an average of at least 75 percent. Evidence to support this statement has been recorded by CARDI and ORD in working with over fifty farmers. The current variety being tested is

not new which suggests major productivity increases may still be possible through further collaboration with the world research community.

There is evidence that domestic and regional markets for peanuts and products will continue with a St. Vincent export quota of 250,000 pounds per year to Guyana and Trinidad importing about 2,600 tons per year. Peanuts also provide the human population with necessary nutrients, including a highly digestable protein and oil. Peanut hulls may be used for fuel, poultry litter or in livestock feeds.

Greater and high quality peanut production would also improve St. Vincent's foreign exchange account. Higher production, coupled with continuing strong demand would increase small farmers' net income and consequently their level of living.

Sweet Potatoes

Based on our observations of the market and pricing system, as well as potential productivity increases through variety screening and improved cultural practices, it was decided that sweet potatoes offer potentials for increased production and for improving storage and quality characteristics. St. Vincent currently has a 1,800,000 pounds per year gap in its sweet potato quota to Trinidad. Establishing an integrated assistance program will contribute to increasing the country's total production as well as facilitate better coordination of the production/marketing sectors. Improved quality and orderly production/marketing of sweet potatoes will provide additional foreign exchange and assist St. Vincent in meeting its CARICOM quota. The high yield improved quality will provide individual small farmers, who adopt new varieties and technology, with higher net income, market and food security.

Carrots

Carrots were selected because they will most likely respond to increased assistance within the integrated package framework. Carrot production has been frequently reduced substantially due to various disease infestations. The average

yield per hectare is about 2,500 kilograms compared to 7,500 kilograms in 1976. Observations of produced varieties, the production-marketing process, and discussion with informed individuals indicated that both yields and quality could be increased substantially in response to an integrated assistance program.

Increased production, coupled with improved quality and system coordination would benefit the country in its foreign exchange account and assist the Marketing Corporation in marketing its quota with Trinidad which has a gap of about 2,000,000 pounds per year. Individual farmers will achieve higher net income and experience less risk in regard to market outlets and prices. Improved quality should also enhance St. Vincent's regional and/or international competitive position.

Poultry

There exists considerable potential for increasing poultry production on a moderate number of farms on a commercial scale. In addition to its potential as an important source of animal protein to the population, domestic poultry production would reduce the quantity imported and thus save on foreign exchange. While it will be difficult to compete with the backs and necks being imported, whole chicken imports are substantial.

The availability of feedstuff either from commercial sources (feed mill) or from crop by-products, makes poultry a viable choice for potential assistance.

We realize that an educational program and improved marketing facilities and production-marketing coordination are necessary elements for a successful program. The integrated approach, which we are recommending should provide for such preconditions.

Secondary Commodity Set

Although these four commodities are classified as of secondary importance, they are important and have substantial potentials. The current state of technology

and potential market outlets on the island or in regional/world trade justify their selection as potential commodities in the integrated assistance package.

Citrus production and quality would respond positively to improved technology and an orderly market system. The knowledge and information resulting from the assistance program should add to the certainty required for informed planning and production. Domestic and regional markets provide for a ready outlet of increased and improved production. CATCO is projected to sell 750 tons each of oranges and grapefruits to Trinidad in 1983-84. Also, St. Vincent currently imports citrus concentrate for processing into juice drinks. Potentials for foreign exhcange earnings and possible employment opportunities in the production (and possibly processing) make citrus an attractive target.

Pigeon peas are another potentially important commodity which could respond favorably to an assistance program. The available technology and availability of local and regional markets are important factors in selecting the commodity. There is good potential for improving human nutrition, supplementing animal feed, increasing employment and use of land in the Grenadines as well as foreign exchange earnings. In 1984-85, CATCO is projected to sell 60 tons of fresh pigeon peas to Trinidad from the Windward islands. Thus, an increase in the total production, as well as yield, would appear to have potential positive impacts on the national and small farm income and important equity consequences for agriculture in the Grenadines.

Sheep and goats have good potential in St. Vincent small farm agriculture. These two species are likely to respond to better husbandry practices, breeding programs and improved veterinary facilities and care. They are especially suitable for small-scale operations and provide a good source of protein (both meat and milk) to rural and urban populations.

The availability of natural vegetation and foodstuff from other crops are important factors in assessing sheep and goat production potentials. An assistance

program that includes breeding, health, market and education components could have a measurable impact on the small farm net income, health and security. The nation could benefit from the additional foreign exchange possible with higher production for domestic as well as foreign markets. At present, there is a strong export market for exporting sheep and goats to Trinidad.

Fisheries are also a potentially important area for assistance. St. Vincent's fishing industry would probably respond to serious efforts. The current fishing techniques, lack of sufficient technical support, pricing policy and the lack of knowledge regarding its potentials have raised concerns about its future. While the Government of St. Vincent is seeking financial and technological assistance from international donors in the fisheries area none has yet materialized. We recommend that the USAID consider fisheries support in terms of basic information generation if efforts to attract other assistance fail. This should not imply that this commodity is of less potential importance to St. Vincent's economy, rather this recommendation is based on the fact that an assistance program in this area will be different than for any other commodity.

Marketing - Program Element 1

The proposed integrated project would involve specific activities directed primarily at bringing about change and improvement in the marketing of the selected commodities. This would involve not only the commodities selected, but also farmers, civil employees and institutions.

Functions

Although the existing marketing system provides for the basic functions to both producers and consumers, there are significant problems. In the proposed integrated approach, recognition should be given to the importance of the deficiencies in the operational and pricing aspects of the domestic market system

and to development of better foreign market intelligence. Actions should be implemented to improve the integration of the domestic production and marketing sectors. At present, marketers have very little information on potential production of commodities upon which to make future commitments with foreign buyers. With the substantial year-to-year variations in commodity output, as discussed earlier in the report, marketers find it risky to agressively seek markets where future commitments are needed. An additional activity is needed on searching out and communicating export market potentials. This function will be critical for maintaining flexibility and competing in the dynamic competitive situation in which St. Vincent finds itself.

Activities in marketing should include concentrated efforts to improve the quality and loss control of the selected commodities. Fruit, vegetable, and meat products are particularly sensitive to quality deterioration and loss through improper handling and transport. This appears to be a major problem for much of the export and some of the domestic trade. In addition, measures need to be instituted for developing appropriate classification of the selected commodities so that farmers and marketers can understand what is desired and be provided incentives for producing higher quality commodities.

There is a need to develop a capability to take advantage of new opportunities and diagnose marketing problems which may develop that are impossible to predict at this time. Again, the dynamic nature of Vincentian agriculture requires that this kind of capability be institutionalized.

Procedures

It is tentatively proposed that the marketing intelligence, communication and diagnostic capability be institutionalized in the Marketing Corporation with close cooperation with MTA units, particularly the Agricultural Statistics and Special Studies Unit (see Program Element3). To better integrate the domestic production

sector with marketers, a simple but effective crop production prediction sampling method should be developed. The implementation of this method could be done by the special studies unit within the MTA. When sufficient information is developed, regarding foreign or domestic market potentials, this production prediction information could be combined with demand possibilities to produce "outlook" types of reports for wide distribution. The export market intelligence will involve support for travel and close liaison with CATCO and other buyers. Analysis should be made of the usefulness of organizing commodity producer groups as a way of effectively integrating farmers with domestic and foreign marketers.

Improving quality and reducing loss can be assisted by developing appropriate classification for the selected commodities based on what the buyers feel is important. This will require technical assistance and an education program for farmers and markets persons. In addition, more appropriate varieties and cultural and harvesting methods are important. These should be objectives for the applied research program (see Program Element 2). Attention should be paid to developing and implementing more appropriate packaging and container use in domestic handling. Utilization of local knowledge and use of specialists should produce inexpensive alternatives for introduction. Initial implementation of this activity may require subsidized provision of material. Lastly, commodity storage is to be investigated by CDB. We anticipate that short-term cool storage in the Kingstown area will be necessary. Actual recommendations regarding type and level of support should await that feasibility study.

We anticipate that marketing problems will continue to arise as Vincentian agriculture continues to adjust to dynamic forces. Trained people and diagnostic support will be required to institutionalize this capability.

Personnel Requirements

The personnel requirements for implementing the functions of the marketing element include:

1. Technical assistance in the form of a pragmatic, experienced food product market person. Such a person would give leadership to domestic market integration efforts, quality and loss control tasks, and diagnostic studies of domestic marketing problems.
2. Technical assistance in the form of a commodity seller for foreign market intelligence and development. This person should be supported by the Marketing Board.
3. Short-term specialists who would be utilized for assistance in quality control, post-harvest loss, or other specific problem solution.
4. Long-term training for a replacement for the technical assistance specialist involved in the domestic marketing aspect. Short-term training will be required for extension personnel, market persons, and farmers. This training would be conducted by personnel from the Marketing Corporation, private businesses, and short-term specialists.

Resources Needed

To perform the necessary tasks, the following support is needed:

1. Two long-term technical assistance personnel - one of which should be supported by the Marketing Corporation from the beginning of the project;
2. Long-term training to B.S. level for a Vincentian;
3. Short-term training of extension, market and farm level personnel;
4. Travel, materials and supplies;
5. Flexible funds for gaining access to needed technical expertise of about 20 person months for the life of the project.

It is recommended that the Marketing Corporation assume the responsibility of locating and hiring a suitable replacement for the long-term specialist in foreign market development that could phase into the position as the technical assistance person leaves. Rationale and resource requirements for short-term cool storage construction will be forthcoming from the CDB study.

Production - Program Element 2

The purpose of the proposed production element of the integrated commodity strategy is to access and adapt technology for a few selected commodities which

will provide substantial increases in productivity to reduce unit costs of production and increase farmer incomes. The marketing element described in the previous section would be primarily focused on these few selected commodities so that both the production and marketing elements will be integrated and jointly implemented. There may be good reason to start applied production research implementation prior to marketing efforts being fully initiated.

Functions

An applied commodity-focused research program must have, as a basis, information about the role of and problems associated with the commodities in the farming system in which they exist. That understanding will have to be further developed.

Locations with relevant research programs for the specified commodities in other countries will have to be located and regular contact established. Information will be needed on varieties with higher yield potential and/or better quality characteristics, and improved agronomic practices, fertilization routines, plant protection methods, and harvest practices.

An adaptive applied research program should be established to screen and select varieties obtained, and to modify practices to conditions in St. Vincent and the Grenadines. An adaptive research capability integrated with the wider research community can be an important source of growth for agricultural development in the future. Evidence cited previously suggests there are substantial productivity gains to be made by further development of this capability. Without this capability agricultural productivity will lag relative to other countries and export and import substitution objectives will be more difficult to achieve. This appears to be happening at the present time.

Farm level testing of adaptable varieties and practices will be needed to ascertain the viability and profitability of the new technology when applied to farm conditions under farmer management. Further adaptive research may be needed to produce useful technology components for farmer use.

When useful results are obtained, efforts to extend results will be required. In addition, seed multiplication plans will need to be implemented.

What is proposed is an adaptive research capacity which utilizes to the maximum extent possible available technology. St. Vincent cannot, at this time, support a development or basic research program on any commodity. However, for new technology to be more rapidly adopted and emerging problems more effectively addressed, an applied adaptive capacity which links with other research programs, including CARDI, should be developed.

Procedures

Activities oriented to better understanding the farming systems into which the selected commodities fit should carefully review CARDI farming systems studies, capitalize on the considerable knowledge of MTA and ORD personnel and others, as well as make use of first hand observations in farmers' fields. If further study is needed, the special studies capability in the MTA could be utilized.

Identifying and establishing useful relationships with relevant research programs in other countries will require a person with considerable experience as well as support for travel and material purchases and shipment.

An experimental site will need to be established for variety testing and screening, applied research activities, and seed multiplication. The present MTA research site is to be moved when support and a suitable location are identified.

The institutionalization of this element is already achieved in that the MTA has a research officer. The person identified for that position should be trained to M.S. level agronomy/horticulture so that research leadership can be maintained after USAID assistance terminates.

Since specific difficult problems will arise regarding the adaptation and testing of new technology, use of specialists from other research agencies should be supported. Coordination with extension services should be achieved through

working with extension personnel in farm level testing so that they can better understand the technology being developed.

Personnel Requirements

The personnel requirements for implementing the applied research element area are as follows:

1. Technical assistance in the form of an experienced horticulture/ agronomy researcher for the life of the project.
2. Training for a Vincentian to M.S. level to continue research activities initiated and give leadership to other thrusts.
3. Short-term specialists for assistance to solve problems that will arise during implementation.

Resources Needed

In order to perform the necessary tasks and assure continuity of initiated activities, it is recommended that funds be made available for the following:

1. Training a research officer to M.S. level.
2. Supporting a long-term specialist.
3. Research facilities at the new experimental site.
4. Travel to relevant research locations.
5. Support for use of short-term specialists of about four person months per year.
6. Research expenses for materials, equipment and supplies.
7. On-site training of extension workers and farmers.

Program Planning, Implementation and Monitoring - Program Element 3

Functions

It is proposed that what might be called a "special studies" capability be added to the Agricultural Statistics Unit of the MTA. The purpose to be served by such a sub-unit would be to provide basic, descriptive information about the physical and human resource base of the agricultural and rural sector for use in design and monitoring of action programs. Initially, this capability would be

utilized to service the needs of the marketing and production project elements as specifically mentioned in earlier sections. A description of activities follows.

First, it is proposed that a new Census of Agriculture be done to update the materials reported in the Census of Agriculture for St. Vincent of 1972-73. The need for a new census is documented in the April 20, 1982 Economic Memorandum of the World Bank. The utility of a new census can be characterized by paraphrasing the objectives cited on Page 2 of the Census of Agriculture of 1972-73: to provide benchmark data against which to measure change, to provide a sampling frame for future studies in agriculture; and to provide "the basic data for planning, for formulating and appraising agricultural development projects." Given the size of the task, it is proposed that the census be carried out on a contract basis by an appropriate agency, under the close supervision of the MTA and other relevent government units.

Second, it is proposed that special studies be carried out within the MTA on the basis of relatively small samples and building on the more comprehensive data provided by the new census. The purposes to be served by such special studies include short-term projections of the supply of particular commodities to aid the marketing process; studies of farm labor availability, motivations to engage in farm labor, and labor productivity; and estimates of the resource base and prospects for more intensive exploitation in such areas as fisheries and forestry. The latter type of study might again be most appropriately carried out on a contract basis with individuals expert in those areas, since they may not lend themselves to a sample survey format.

Third, an important purpose to be served by the proposed sub-unit for special studies is the dissemination of the results of studies to both the public and private sectors. If the information is to be useful in rationalizing

the marketing and production process it must be widely disseminated and presented in a form suitable for the various audiences involved, including farmers.

Fourth, and finally, the special studies sub-unit would work through and with personnel in the MTA in carrying out the studies to provide maximum linkage between the sub-unit and problems in the real world.

Procedures

It is proposed that consideration be given to the use of aerial photographs, with a grid or other overlay, to provide a cluster sampling frame for the proposed Census of Agriculture and subsequent special studies. The Census of Agriculture of 1972-73 was carried out on a sample survey basis and it is proposed that similar sampling proportions could be used in the conduct of the new census. Rough estimates indicate that a sample of 1,500 to 2,000 households would permit both an update of the Census of Agriculture of 1972-73 and an adequate sample of rural non-farm households. The latter sub-sample, not included in earlier censuses of agriculture, is considered important because the dividing line between agricultural production and other economic activities in rural areas is by no means clear. It is essential to locate agricultural production in the context of a diverse and apparently quite flexible context of remunerative activities if productivity is to be improved.

It is proposed that the format of the Census of Agriculture of 1972-73 be adapted so as to permit trend analysis as well as to meet current information needs. Also, additional questions should be added to provide information on, for example, characteristics of the labor force, the range and extent of remunerative activities contributing to total rural household incomes, and household consumption patterns. As indicated earlier, the new census should be carried out on a contract basis by an entity capable of doing the job quickly.

It is proposed that special studies be carried out on a sample survey basis, utilizing the sampling frame provided by the census operation, but based on much

smaller samples. With appropriate coordination, it is envisioned that a given special study could capitalize on the household data for a given case provided by the census, adding only those questions immediately relevant to the special topic at hand. It is further envisioned that additional special studies could be mounted by using the same cases, with the net effect that a panel of respondents (with replacement) would provide a "moving picture" of change over time. The proposed special studies would be carried out by MTA personnel, except as indicated below.

Some special studies will not lend themselves to a sample survey format and/or will require specialized measurement techniques. Assessment of resource potential in fisheries is a case in point, as is assessing soil erosion (see World Bank, Economic Memorandum of April 20, 1982). Such studies could be coordinated by and carried out under the auspicious of the special studies entity via contracts with appropriate experts.

Finally, it is proposed that the recommended communications and training functions of the special studies sub-unit be carried out, to the extent possible, via linkage with other units of the Ministry of Trade and Agriculture and such other public and private entities as may be appropriate. It is the case, however, that the special studies sub-unit will need to have within it persons skilled not only in data manipulation but in preparation of reports. In other words, the procedures for which the proposed special studies sub-unit will be responsible range from study design, through information gathering and processing, to report preparation and publication.

An additional activity, which clearly relates to "special studies" but does not fit neatly within the scope of such an entity, is the critical matter of action program management. It is proposed that intensive but short-term, preferably on-site, training be provided on the general topics of action program planning and action project management. The analytic capability of the special studies

sub-unit is relevant here but the planning and management functions go beyond that. It is recommended that unit heads of the MTA and such other persons as may be designated by MTA, be the primary target audience for such training. It is proposed that the training be done by experts in program management, hired on a short-term contract basis. Alternatively, it may be possible for the primary target audience to take advantage of existing training programs sponsored by the CDB or other regional agencies.

Personnel Requirements

The personnel requirements for the implementation of the several functions envisioned are as follows:

1. Technical assistance in the form of one survey research expert with a social science orientation. Such an expert would serve as temporary replacement for the soon-departing head of the Agricultural Statistics Unit and would be responsible for organization of that unit with its expanded mandate (i.e., agricultural statistics plus special studies).
2. Immediate implementation of a one or two-year training program is envisioned in order to prepare a local person for long-term assumption of the responsibilities of unit head.
3. Some two to four additional assistants will be required for the expanded unit, beyond the two assistants now employed by the Agricultural Statistics Unit. Such assistants would ideally have some skills in survey research procedures but some specialized and intensive training may be required.
4. As indicated previously, the personnel requirements of the proposed Census of Agriculture of 1983, as well as some types of special studies, are to be met by contracting for services as needed.

Resources Needed

Rough estimates of the financial and physical resource needs of the proposed special studies sub-unit are listed below:

1. Full funding of the proposed Census of Agriculture of 1983, on the scale

described earlier, including construction of the proposed sampling frame will require financial support on the order (in US$) of 150,000 to 200,000.

2. Support for the special studies survey operation (for approximately three years) will require funding on the order of (in US$) 180,000 to 200,000. This assumes an average of two studies per year with sample sizes in the range of 200 to 300 cases.
3. All other requirements of the proposed special studies--long-term technical assistance, short-term technical assistance for certain special studies, intensive training for permanent staff, equipment, supplies, and small-scale in-house computing capability with appropriate peripheral hardware and software--can be met with financial support on the order of (in US$) 350,000 to 500,000.
4. Space needs for offices, work (laboratory) space, and storage on the order of 1,000 to 2,000 square feet are anticipated. Space needs, and appropriate furnishings for that space, are treated on an aggregate basis in another section of this report.

Space Requirement: A Summary and Recommendation

Description of the above program elements has centrally included a need for a number of long-term and short-term technical assistance personnel, additional permanent personnel, and a range of new program thrusts. These people obviously need space in which to work. Office, laboratory and space for group training will be needed. Particularly better space is needed for plant protection, fisheries, and veterinary services.

The space presently occupied by the MTA is rather fully utilized, to the point of impeding the work process of present MTA staff. It is recommended, therefore, that the entire project include funding for rental of additional space in the short-run, and for addition of a modest wing to the present MTA complex in the early stages of the project activity.

Though estimates of space needs must necessarily be rough at this stage, we suggest that something on the order of 10,000 square feet of new space be added

to present facilities. Roughly estimated, the cost of such construction would be (in US$) 500,000. Appropriate furnishings for such space might add another (in US$) 150,000 to the estimate, bringing the total cost of new space requirements to (in US$) 650,000. This estimate does not include funds for short-run and short-term space rental to accommodate the very early stages of project activity.

NOTES

1. Much of the data in sections A, B, and C is taken from the Economic Memorandum on St. Vincent and the Grenadines - World Bank Report No. 3817 - CRG, April 20, 1982.
2. The next six paragraphs draw heavily from the opening statement of Mr. Dacon, Acting Prime Minister, to a CDB project identification mission from October 4-8, 1982.
3. The following data were taken from Estimates of St. Vincent and the Grenadines, Ministry of Finance, Planning, and Development, 1981.
4. The following section draws heavily from the St. Vincent Caribbean Agricultural Project Institutional Analysis prepared in the MTA.
5. With the establishment of the Eastern Caribbean Feed Mills at Campden Park in St. Vincent, the price availability and use of local foodstuffs for feed has improved.

APPENDIX I

PEOPLE CONSULTED IN ST. VINCENT BY THE MUCIA/USAID TEAM

AUGUST, SEPTEMBER, 1982

Minister V. Beache	Minister	Ministry of Trade & Agriculture
Mr. K. Browne	Parliamentary - Secretary	"
Mr. J. Williams	Permanent Secretary	"
Mr. C. Williams	Chief Agricultural Officer	"
Mr. G. Vanloo	Dep. Chief Agricultural-Officer	"
Mr. K. Bonadie	Agricultural Officer - (Extension)	"
Mr. St. C. Barker	Agricultural Officer - (Livestock)	"
Mr. K. Morris	Agricultural Officer - (Fisheries)	"
Mr. C. Nicholls	Agricultural Officer - (Forestry)	"
Mr. C. Gunsam	Agricultural Officer - (Research)	"
Mr. L. Gonsalves	Agricultural Assistant (Extension)	"
Mr. E. John	Agricultural Assistant (Extension)	"
Mr. M. Fairbaim	Agricultural Instructor (Plant Protection)	"
Mr. N. Raninga	Veterinarian	"
Ms. U. Pardisani	Agricultural Statistics Unit	"
Mr. G. Walker	Peace Corps (Fisheries)	"
Mr. W. April	Peace Corps (Livestock)	"
Ms. E. Stephens	Peace Corps (Information)	"
Mr. K. John	Director, Central Planning - Unit	
Mr. G. Telemaque	Central Planning Unit	
Mr. V. Dasilva	Marketing Corporation	
Mr. G. Daniel	Director, Agricultural Development Corporation	
Mr. O. Davis	Banana Association	
Mr. B. Charles	Arrowroot Association	
Mr. H. Mc Connie	Agricultural Bank, Development Corporation	
Mr. J. Jackson	Agricultural Bank, Development Corporation	
Mr. N. Kirton	Team Leader, CARDI	
Mr. C. Bishop	CARDI	
Mr. J. Greene	Organization for Rural Development	
Mr. M. Defreitas	Eastern Caribbean Agency	
Mr. C. Samuel	National Commercial Bank of St. Vincent	
Mr. M. Williams	Ministry of Communication, Works and Labour	
Mr. K. Boyea	Eastern Caribbean Flour Mills Limited	
Mr. W. Jack	Mespotamia Banana Packing Plant	
Mr. T. Ballah	Senior Customs Officer	

APPENDIX I (CONT'D)

PEOPLE CONSULTED IN ST. VINCENT BY THE MUCIA/USAID TEAM

AUGUST, SEPTEMBER, 1982

Ms. C. Smith	ORD Field Worker, Farmer	Troumaca
Mr. J. Stapleton	ORD Field Worker, Farmer	Rose Hall
Ms. M. Lewis	ORD Field Worker, Farmer	Troumaca
Ms. R. Cain	Farmer, Belmont	
Ms. E. Michael	Farmer, Chateaubelair	
Mr. C. Matthews	Farmer, Chateaubelair	
Ms. I. Delpeche	Farmer, Chateaubelair	
Mr. L. Cyrus	Farmer, Rose Hall	
Mr. A. Stapleton	Farmer, Rose Hall	
Mr. A. John	Farmer, Rose Hall	
Mr. A. Browne	Farmer, Rose Hall	
Ms. M. Prince	Farmer, Rose Hall	
Ms. P. Samuel	Farmer, Rose Hall	
Ms. E. Chambers	Farmer, Rose Hall	
Mr. A. Byam	Farmer, Troumaca	
Mr. R. Wyllie	Farmer, Troumaca	
Ms. R. Smith	Farmer, Troumaca	
Mr. P. Williams	Farmer, Troumaca	
Ms. V. Ghent	Farmer, Troumaca	
Mr. T. Providence	Farmer, Troumaca	
Ms. M. Duncan	Farmer, Troumaca	
Mr. A. Cyrus	Farmer, Troumaca	
Ms. J. Stapleton	Farmer, Troumaca	

APPENDIX II

COMMITTEE ON PROGRAM IDENTIFICATION FOR USAID ASSISTANCE TO AGRICULTURE IN ST. VINCENT AND THE GRENADINES

Vincent Beache	Minister	Ministry of Trade and Agricultu
Joslyn Williams	Permanent Secretary	"
Grafton Vanloo	Dept. Chief Agricultural Officer	"
St. Clair Barker	Agricultural Officer (AO) Livestock	"
Kenneth Bonadie	AO - Extension	"
Charles Gunsam	AO - Research	"
Kerwyn Morris	AO - Fisheries	"
Calvin Nicholls	AO - Forestry	"
N. Raninga	Veterinarian	"
Noel Kirton	CARDI	
Jim Rutherford	Central Planning Unit	
Claude Samuel	National Commercial Bank of St. Vincent	
Gilbert Telemaque	Central Planning Unit	
Trevor Arscott	USAID/MUCIA Team	
Corrine Glesne	"	
Earl Kellogg	"	
Earl Swanson	"	

APPENDIX III

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APPENDIX IV

This report identifies several constraints on agricultural development in St. Vincent and the Grenadines. They are classified and listed below. These constraints are consistent with, but more detailed than, those described in the latest Economic Memorandum on St. Vincent and the Grenadines prepared by the IBRD/IMF/CDB economic mission working with GOSV. While the following list is not meant to denote detailed priority rankings, all constraints listed were judged to be significantly important by the team and several persons involved in agriculture in St. Vincent and the Grenadines.

A. MARKETING CONSTRAINTS

1. Uncertainty and small number of export markets
2. Confusion and distortion in price formation and transmission system
3. Low quality and lack of uniformity of products
4. High marketing and assembly costs
5. Lack of, or poor farm-to-market roads
6. Inadequate inter-island and extra-regional shipping
7. Lack of adequate storage and warehousing facilities
8. Inadequate information linkage between marketing and production sector.

B. PLANNING, PROGRAMMING, AND IMPLEMENTATION CONSTRAINTS

1. Inadequate mechanism for internal agricultural planning in MTA
2. Need for better information flow regarding status of agricultural projects being considered by the external donor community
3. Lack of basic data on:
   a. Fishing resources
   b. Forestry resources
   c. Agriculture census
4. Need for development of a system for data collection and maintenance

5. Inadequate training in agricultural institutions in:
   a. Managerial skills
   b. Project preparation skills
   c. Technical matters
   d. Skills
6. Inadequate physical facilities and equipment:
   a. Crop Protection Unit
   b. Fisheries Unit
   c. Home Economics Unit
   d. Veterinary Unit
   e. Forestry Unit
   f. Extension Housing
   g. Central Ministry

C. PRODUCTION SUPPORT SYSTEM CONSTRAINTS

1. Inadequate ability to productively access and use regional and extra-regional research and improved technology
2. Need for improvement of farm input accessibility and timeliness of:
   a. Fertilizers
   b. Pesticides
   c. Seeds
   d. Planting material
   e. Animal health services
   f. Plant protection services
   g. Hand tools
3. Lack of rainfall in the dry season
4. Inadequate resources to control soil erosion problems
5. Need for improved agricultural credit system
6. Low labor productivity and motivation
7. Need for improved and extended land reform efforts

APPENDIX V

Appendix V is a list of the new and ongoing Vincentian projects financed primarily by donor agencies. The information that is taken from the World Bank's Economic Memorandum on St. Vincent and the Grenadines (1982) which applies directly to agricultural development is starred (*).

ST. VINCENT - ADDITIONAL NEW PROJECTS (U S $'000)
CDB Mission to St. Vincent and the Grenadines

	Amount	Source
AGRICULTURE, FORESTRY AND FISHERIES		
Fruit and Vegetable Processing Unit	1,050	CDB
Improvement of Rum Distillery	450	CDB
Arrowroot Consolidation	440	CDB
TRANSPORTATION		
Feeder Roads III	3,000	CDB
Feeder Roads IV	4,250	CDB
WATER SUPPLY AND SEWERAGE		
Grenadines Multi-purpose Feas. Study (Water Resource Development)	75	CDB
Grenadines Multi-purpose Project (Water Resource Development)	2,625	CDB
EDUCATION		
Training in Project Preparation/Administration	100	CDB

ST. VINCENT - MAJOR NEW TECHNICAL ASSISTANCE[1]
(US$'000)

	Total Cost	External Financing Amount	Source	Duration	Comments
PROJECT - RELATED					
*Agrarian Reform	70	70	OAS,UNDP/ILO	..	Study
*Agricultural Planning Unit	150	150	UNDP	2 Man/Years	
*Agricultural Census	100	100	Unknow	..	
*Agricultural Promotion/Marketing Services	200	200	Unknown	2 Man/Years	Technical & Financial Assistance
*Arrowroot Varietal Breeding/Harvesting	..	..	CIDA,CDB,UK	..	Research
*Arrowroot Managerial & Tech. Training	..	..	CIDA	..	Training
*Arrowroot Packaging, Marketing & Use Research	..	..	CIDA	..	
Tourism Promotion	200	200	Unknown	2 Man/Years	Technical & Financial Assistance
Historic Sites & Tourist Attraction Development	75	75	Unknown	1 Man/Year	
Airport Improvement Mainland St. Vincent	100	100	Unknown	..	Feasibility Study
Airstrip Bequia	30	30	Unknown	..	Feasibility Study
Improvement Vigia Highway	30	30	Unknown	..	Feasibility Study
Construction Monitoring Unit	75	75	UNDP	1 Man/Year	
Set-up of Hydrological Network	75	75	Unknown	1 Man/Year	
Administrative Reform Education	75	75	Unknown	..	
Adult Education & Literacy Program I	36	36	Unknown	..	
OTHER					
*Agricultural Statistician	75	75	Unknown	1 Man/Year	
*Agricultural Mechanical Engineer	75	75	Unknown	1 Man/Year	
Water Engineering	35	35	Unknown	6 Man/Months	Training
Student Loans	350	350	CDB to be approached	..	Scholarships
Program Support-Financial Analyst	25	25	UNDP	..	Repatriation
NCB Training	15	15	UNDP	10 Weeks	Training
Social Security	36	36	UNDP/ILO	20 Weeks	
Postal Management	30	30	UNDP	5 Man/Months	Training
Manpower Planning	25	25	UNDP/ILO	..	Study

*Projects oriented primarily to agriculture.
.. Not determined, not applicable.

ST. VINCENT - MAJOR ONGOING TECHNICAL ASSISTANCE
(US$'000)

	Total Cost	External Financing Amount	Source	Duration	Comments
PROJECT - RELATED					
Industrial Promotion Service	130	130	UK(TCO)	2 Man/Years	Technical & Financial Assistance
Trade & Tourism Promotion	156	156	EEC	..	
Yachting Study	35	35	CDB	..	Feasibility Study
* Fuel & Feeds Recovery from Arrowroot Processing Waste	46	46	CDB	..	Study
Biogas Recovery from Arrowroot Processing Waste	2	2	CDB	..	Study
* Mount Bentick Sugar Factory Manager	66	66	CDB	2 Man/Years	
* Land Valuation Adviser	90	90	UK(TCO)	2 Man/Years	
Cumberland Hydro-electricity Study	453	378	UNDP/IBRD	14 Man/Months	Feasibility Study
Improvement of Electricity Supply (hydro & diesel)	..	..	CIDA	Short Term	
Integrated Energy Program - Orange Hill	35	35	BDB	..	Study
Promotion of Simple, Domestic Solar Food Dryers(R)	2	2	CDB	..	Study
* Assessment Water Resources (R)	118	118	UNDP	2 Man/Years	
Computer Manager	180	180	UK (TCO)	4 Man/Years	
Grenadines Star-ticketing Expert	3	3	UK (TCO)	2 weeks	
Grenadines Star-Engineer	3	3	UK (TCO)	2 weeks	
Law Revision - Law Reform	..	..	CFTC	2 Man/Years	
NON-PROJECT-RELATED					
Government Project Offier - CPU	16	16	CDB	2 Man/Years	
Economic/Social Planning Project-CPU	510	510	UNDP	Several	
Economist CPU	18	18	UK (ODI)	2 Man/Years	
Financial Adviser	9	9	UK (BESO)	6 Man/Months	
* Veterinary Surgeon	..	..	CFTC	2 Man/Years	

(continued)

ST. VINCENT - MAJOR ONGOING TECHNICAL ASSISTANCE (continued)

	Total	External Financing			
		Amount	Sources	Duration	Comments
NON-PROJECT-RELATED (cont'd)					
Accountancy Expert	9	9	UK (BESCO)	6 Man/Months	
* Marketing & Packaging Adviser	..	..	CFTC	1 Man/Years	
Accountant - DevCo	22	22	CDB	2 Man/Years	
Small Business Development (R)	64	64	CIDA	..	Training Course
Government Funding Scheme Manager	90	90	UK (OSAS)	2 Man/Years	
Government Funding Scheme Engineer	90	90	UK (TCO)	2 Man/Years	
Deputy Chief Engineer, Communication and Works	90	90	UK (OSAS)	2 Man/Years	
Base and Water Management Training (R)	39	39	CIDA	..	Training Courses
Institutional Strengthening CWA	171	121	CDB	26 Man/Months	
Health and Family Planning and Training 77/82	399	399	UNFPA	..	
Nurse Practitioner Training (R)	118	118	PAHO	..	
Medical Administrative Services Advisor	90	90	UK (TCO)	2 Man/Years	
Social Development Officer	90	90	UK (TCO)	2 Man/Years	
West Indies Training Scheme 81/82-84/85	296	296	UK	..	Scholarships
Student Loans	350	350	CDB	..	Scholarships
Training, Technical Assistance (various sectors)	272	272	EEC	..	
Pool of Experts (various sectors)	55	55	EEC	..	
Legal Draftsman (R)	90	90	UK (TCO)	2 Man/Years	
Legal Draftsman	..	..	CFTC	3 Man/Years	
Custom Services Adviser	90	90	UK (TCO)	2 Man/Years	

* Projects oriented primarily to agriculture.
(R) Part of Regional Program
.. Not available, not applicable.

ST. VINCENT - MAJOR NEW PROJECTS AND SOURCES OF FINANCING
(US$'000)

	Total Cost	External Financing Amount	External Financing Source	Counterpart Financing Amount	Counterpart Financing %	Recurrent Costs FY1981/82	Recurrent Costs 1984/85
DIRECTLY PRODUCTIVE PROJECTS							
* Banana Development Program	740	740	UN, Unknown	--	--	--	
* Cocomut Development Program	500	500	Unknown	--	--	--	
* Integrated Crop Diversification	1,000	850	CDB, Unknown	150	15	--	
* Produce Storage Facilities	800	800	CIDA, CDB	--	--	--	
* Agricultural Extension & Research	800	800	Unknown, USAID	--	--	--	
* Agriculture Credits	2,000	2,000	CDB, Unknown	--	--	--	
* Development of Livestock Industry II	700	700	CIDA, Unknown	--	--	--	
* Development of Fisheries Industry	2,000	1,750	FAO, CDB	250	12	--	
* Integrated Arrowroot Development	2,050	1,800	CDB	250	12	--	
* Development of Agro Industry - I	600	600	Trinidad, Unknown	--	--	--	
* Improvement of Sugar Factory	800	800	Unknown	--	--	--	
Industrial Estates Development	1,760	1,585	CDB, CIDA	175	10	--	
Industrial Credits	2,000	2,000	CDB, Unknown	--	--	--	
Development/Handicraft Industry	250	250	Unknown	--	--	--	
Hotel and Conference Facilities	6,300	5,500	Private Sources	800	13	--	
Development of Fort Charlott II	50	50	Unknown	--	--	--	
* Feeder and Rural Roads	11,200	9,520	Unknown	1680	-15	--	
* Soil & Water Conservation	1,000	1,000	UNDP, Unknown	--	--	--	
Construction/Air Cargo Warehouse	150	150	Trinidad & Tabago	--	--	--	
Development of Grenadines-Phase I	3,000	2,550	CIDA, Trinidad, UK	450	15	--	
ECONOMIC INFRASTRUCTURE							
Construction/Windward Highway II & III	800	800	UK	--	--	--	
Upgrading Leeward Highway	1,500	1,350	Unknown	150	10	--	
River Embankments & Highway Bridges	500	425	Unknown	75	15	--	
Port Development	2,220	2,000	CDB	220	10	--	
Micro-Hydro Station - Owia	180	180	UK	--	--	--	
Hydro-Electrictric Development - Cumberland	15,000	14,250	UNDP, IBRD, CIDA, CDB, Unknown	750	5	--	
Strengthening of Government Funding Scheme	1,339	1,339	UN, Unknown	--	--	--	
Foreshore Infrastructural Development	3,000	3,000	Unknown	--	--	--	
Storm Damage Rehabilitation	1,389	1,304	EEC, UK, Unknown	85	6	--	

(continued)

ST. VINCENT - MAJOR NEW PROJECTS AND SOURCES OF FINANCING (continued)

	Total Cost	External Financing		Counterpart Financing		Recurrent Costs	
		Amount	Source	Amount	%	FY1981/82	1984/8
OTHER PROJECTS							
Water Development	5,500	4,950	CDB, Netherlands Unknown	895	10	--	
Completion of Sewage System	836	836	Unknown	--	--	--	
Solid Waste Management Program Phase	213	213	Unknown	--	--	10	
Population Center	200	200	Unknown	--	--	--	
Construction, Renovation, Extension of Schools	3,000	3,000	UK, Unknown	--	--	--	
Teachers Quarters and Training Centers	450	450	Unknown	--	--	--	
Park Hill Housing Scheme	370	370	UK	--	--	--	
Gorse/Mangrove Resettlement-Phase II	370	370	UK	--	--	--	
House of Assembly	926	926	UK, Unknown	--	--	--	
Purchase of Police Radios	160	160	UK	--	--	--	

*Projects oriented primarily to agriculture.

ST. VINCENT - MAJOR ONGOING PROJECTS AND SOURCES OF FINANCING
(US$ 000)

	Total Cost	External Financing		Counterpart Financing		Recurrent Costs	
		Amount	Source	Amount	%	FY1981/82	1984/85
AGRICULTURE, FORESTRY AND FISHERIES							
* Banana Development Program IV	173	173	UK	--	--	--	
* Aircraft Leafspot Spraying	556	393	CDB	163	30	30	
* Sugarcane Production (Farmers' Credits)	555	370	CDB, local	185	33	--	
* Agricultural Credits (FIC II)	240	240	CDB	--	--	--	
* Agricultural Feeder Roads II	2,094	2,005	CDB	89	4	*	
* Development of Livestock Industry	572	572	EEC	--	--	60	
* Input Storage Facilities	185	185	UK	--	--	40	
* Hurricane Rehabilitation	318	318	EEC	--	--	--	
* Reafforestation	92	92	US	--	--	--	
INDUSTRY							
* Establishment of Arrowroot Factory-Owia	355	170	CDB	185	48	--	
* Mount Bentinck Sugar Factory	8,242	7,131	CDB, Trinidad	1,111	13	--	
* Diamond Dairy Factory	3,662	3,296	CDB	366	10	--	
Industrial Estates III	1,761	1,761	CDB	--	--	--	
TRANSPORTATION							
* Development of Roads - the Grenadines	247	225	US, Local	22	9	70	
Surface Dressing Program	64	64	UK	--	--	--	
Expansion of C.F.S. Workshop	1,391	1,391	UK,OPEC,UNDP,Korea	--	--	210	
Coastal Protection Program	204	204	US	--	--	50	
Sea and River Defence Program	70	70	UNDP	--	--	20	
Purchase of Cargo Handling Equipment	700	700	CIDA	--	--	100	
POWER SUPPLY							
* Improvement of Electricity Supply	3,388	3,000	CDB	388	11	--	

(continued)

ST. VINCENT - MAJOR ONGOING PROJECTS AND SOURCES OF FINANCING (continued)

	Total Cost	External Financing Amount	Source	Counterpart Financing Amount	%	Recurrent Costs FY1981/82	1984/85
WATER SUPPLY AND SEWERAGE							
* Water Development II - North Leeward	60	42	UNICEF	18	30	--	
HEALTH							
Construction of 3 Health Centers	1,076	947	US, EEC	129	12	481	
Upgrading of Kingstown Hospital I	2,300	2,300	EEC	--	--	690	
EDUCATION							
Construction of 6 Primary Schools	1,447	928	US, Local	519	36	430	
HOUSING							
Barrouallie Housing Scheme	468	119	UK, Local	349	75	--	
Rehabilitation of Walvarro Village	74	--	Local	74	100	--	
Montrose Housing Scheme	73	--	Local	73	100	--	
Fair Hall Housing Scheme	607	--	Local	607	100	--	
Daphne Serviced Sites	83	--	Local	83	100	--	
Rural Housing Scheme (1981-86)	1,400	--	Local	1,400	100	--	
Gorse/Mangrove Resettlement Phase I	210	210	UK, EEC	--	--	--	
OTHER							
Repairs to Foreshore & Sewer Outfall	815	630	US, Local	185	--	--	
Purchase of Garbage Vehicles	233	233	UK	--	--	35	
Purchase of Patrol Boat	1,787	1,687	UK, Private	100	--	700	
Purchase of Computer	226	222	UK	4	2	40	
Volcano Monitoring Unit	780	512	UNDP	269	34	*	
Aeronautical Meteorology	58	58	UNDP	--	--	6	
Land and Property Valuation	89	89	UK	--	--	--	
Community Development 80/82	226	213	UK	13	6	--	
Additional Government Office Space	289	289	UK	--	--	45	
Construction of Community Center	100	100	US	--	--	10	
Mission Administered Fund 81/82	200	200	CIDA	--	--	--	