IICA

AGRICULTURAL SERVICES DEVELOPMENT PROJECT

THE COMMONWEALTH OF THE BAHAMAS
MINISTRY OF AGRICULTURE, TRADE AND INDUSTRY

INTER-AMERICAN DEVELOPMENT BANK

INVESTMENT PROJECTS CENTER (CEPI)

INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE

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THE BAHAMAS

AGRICULTURAL SERVICES DEVELOPMENT PROJECT

(BH-0011)

Report of the Preparation Mission-Phase I

San José, Costa Rica

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CHAPTER I. INTRODUCTION, SUMMARY OF THE PROJECT AND RECOMMENDATIONS FOR PHASE II

A. Background

1.01 In August of 1988, the Inter-American Development Bank (IDB) contacted the Inter-American Institute for Cooperation on Agriculture (IICA), concerning the possibility of the Institute cooperating in the preparation of the Agricultural Services Development Project for The Bahamas, under the procedures of the IDB-IICA Cooperative Program. IICA agreed to collaborate with the Bank in the preparation of the project, and during a special IICA mission to the Bank's Headquarters in September, it was decided that the project preparation effort would be carried out in two phases. Phase I, to take place between October and December of 1988, would seek to identify a suitable project in close consultation with Bahamian authorities and to advance its preparation as much as the time and the information available would permit. Phase II, to be carried out in early 1989, would complete the preparation of the feasibility study.

1.02. Accordingly, a Preparation Mission-Phase I visited The Bahamas for two weeks, from the 6th to the 19th of November 1988, in order to discuss with Bahamian authorities the concept of the project, its scope and strategy, and to start the project preparation effort. The mission consisted of the IICA Mission Coordinator and three consultants: an economist, an agronomist and a marketing specialist.1\ While in the country, the Mission worked in close consultation and collaboration with the Ministries of Agriculture and Finance. The Ministry of Agriculture also provided the mission with technical and administrative support, as well as with physical facilities to work.

1.03. The project's concept, scope and strategy described in this report were arrived at in conjunction with the Ministry of Agriculture, and were presented to, and discussed with, the Minister of Agriculture and the Financial Secretary respectively, during two separate meetings. Both the Minister of Agriculture and the Financial Secretary agreed in principle with the proposals of the mission and gave their support to the second phase of the preparation of the project. The Bank's Representative and Sectoral Specialist in the country accompanied the mission in the meetings. Finally, the mission's results and recommendations were presented to IDB officials in Washington D.C. on the 22nd November 1988.

1\ The Mission members were Mr. João Bosco E. Monnerat, IICA - Mission Coordinator; Dr. Huntley G. Manhertz, Economist; Dr. Herman A. Hamilton, Agronomist; and Dr. Trevor G. Hamilton, Marketing Specialist.

1.04. Due to the mission's effort to advance the work into the preparation phase, this report is laid out as much as possible in the format of a complete project report, leaving for Phase II those aspects and areas that could only be adequately covered by a full project preparation mission. For this reason, some sections or chapters of the report will be found to be more complete than others. At the same time the report format is tailored to respond to the specific needs of this phase of project preparation. Each section, therefore, points out the lacunae to be filled in during Phase II. The report makes use of data, information and analyses previously prepared for The Bahamas, particularly from the following documents:

- Loan Proposal - Agricultural Support Services
  Ministry of Agriculture, Trade and Industry, The Bahamas, 1988.

- Multisector Global Credit Programme (BH-0004) - Project Report
  (Bahamas Development Bank) Inter-American Development Bank, Washington, D.C., 1988.

- National Food and Nutrition Action Plan
  Food and Agriculture Organization-FAO of the United Nations and Ministry of Agriculture, Trade and Industry, The Bahamas, 1985.

- Land Resources of The Bahamas
  By Little et al., Land Resources Division, Ministry of Overseas Development, United Kingdom, 1977.

1.05. This report, therefore, summarizes the findings arrived at during the two-week mission to The Bahamas and the conclusions drawn from discussions held at the IDB. It is intended to be a working document to be discussed with the Bahamian Government and the Inter-American Development Bank so as to facilitate the actual preparation of the project to be proposed.

B. Summary of the Project - Phase I

1.06 The Bahamas has always enjoyed a relatively high degree of political and economic stability and in recent years its economy has been recording average annual rates of growth in output of about 7.3% in real terms, among the highest in the Caribbean.

1.07 The Bahamian economy is, however, primarily sustained by the service sectors, including tourism, financial services and public sector operations, which together account for about 75.0% of GDP. The economy operates very openly and there exists a very high level of dependence on imports, which account for about 60.0% of aggregate demand.

1.08 Foreign exchange requirements are primarily satisfied with tourism revenues and net earnings from financial services. The former has been increasing at an average annual rate of 11.0% in recent years, while the latter has been fluctuating around $80.0 million per year.

1.09 It is a widely held view that the disproportionate dependence on tertiary economic activities (i. e., tourism, financial services, the government sector and commerce) underlies a structural imbalance in the economy of The Bahamas.

1.10 Government economic policy seeks to improve structural balance in the economy by encouraging strong inter-sectoral linkages, particularly between tourism and other sectors. In fulfillment of this policy goal, high priority has been accorded to projects involving tourism expansion, increased private investments in agriculture and manufacturing, and development of the fishing industry.

1.11 Because the peculiar geographic configuration of The Bahamas is that of an archipelago, and the tendency is for economic activity to become centralized in Nassau and Freeport respectively, the Government plans to introduce legislation which will provide incentives to expedite economic and social development in the Family Islands 1\, particularly the Southeastern Islands.

1.12 The agricultural sector has been accorded a central role in the national programme for economic restructuring and development. The sector's present contribution to economic output is however relatively low, accounting for about 4% of GDP, 5.0% of employment and 20% of non-petroleum exports. Although the economic importance of agriculture has been relatively low, in recent years the sector has enjoyed higher than average rate of growth in output. This is attributable to the growth in output of fruits and vegetables. Domestic agriculture, which is controlled by small scale farmers, provides only about 20.0% of the country's food needs. As a consequence, there is a heavy dependence on imports, amounting to about $220 million per year (gross).

1.13 The primary marketing of agricultural produce in the domestic market is essentially controlled by the Government, who assumed this responsibility in 1967. A marketing network takes the form of a central Produce Exchange in Nassau linked to seven Packing Houses on the Family Islands.

1.14 The objective of the marketing strategy adopted is to stimulate agricultural production on the Family Islands by ensuring minimum guaranteed price levels and a permanent reliable outlet for produce.

1.15 Despite the contributions made by the existing marketing arrangements since their inception, marketing still represents the most severe bottleneck to agricultural development. The physical facilities are aged and inadequate, transportation is unsatisfactory, and the lack of other such support facilities as proper roads and a marketing information system further serves to exacerbate the problem. As a result, considerable post-harvest losses occurs on farms and spoilage further contributes to reducing output at various stages in the marketing channel.

1\ The Family Islands are all the islands of The Bahamas archipelago with the exception of the island of New Providence, where Nassau, the capital, is located.

1.16 The constraints which now impede agricultural development in The Bahamas are not, however, considered unsurmountable and it is from this perspective that the Agricultural Services Development Project was viewed.

1.17 The ultimate goal of the project is the attainment of an improved structural balance in the Bahamian economy, through the implementation of a well-coordinated set of activities and programmes directed at stimulating the development of the agricultural sector.

1.18 The most immediate project objectives include:

(i) to increase agricultural production, thereby decreasing importation and improving the food self-sufficiency of The Bahamas;

(ii) to develop agriculture as a viable economic alternative, particularly for the Southeastern Islands, providing improved employment opportunities and discouraging out-migration to the urban centres of Nassau and Freeport; and

(iii) to improve the country's agricultural trade balance by promoting expansion of export agriculture.

1.19 The project is comprised of seven sub-project components, as follows:

(i) Marketing and Marketing Information Systems: These represent two sub-project components for implementation purposes, but are presented together because of their close inter-locking relationship. These components will involve a major upgrading of the marketing system and marketing information network respectively, catering primarily to domestic agricultural products, but also providing the required linkages and appropriate arrangements to support exploitation of export market opportunities. The design of this segment of the project will emphasize the marketing channel for fresh fruits and vegetables.

(ii) Research and Extension Services: The focus of this component will be directed at strengthening the agricultural research and extension capabilities within the Ministry of Agriculture, primarily to address the needs of smaller farmers but also providing a technological base which can cater to larger operations. The research emphasis will be on adaptive research with soils, crops, livestock and farming systems representing central areas of importance. Plant production, food technology, water management, and laboratory services will represent important allied components. A restructured extension service will also provide a critical component in the marketing and marketing information network.

(iii) Land Preparation and Input Supply: This component addresses two issues: (i) the extent and costs of land preparation in the two project sub-areas, and (ii) the operation of the Fish and Farm

Store in Nassau. Land preparation is a crucial aspect of the design and impact of the project. It does not constitute a problem in the Northern Islands but is a matter of concern in the Southeastern Islands because of its high costs. Careful assessment will have to be made of land preparation during the second phase of project preparation. The Fish and Farm Store, which functions as a Government central purchasing and sales agency for agricultural input supplies, will be reorganized and its staff retrained in order to improve its operational capability and responsiveness to an expanding farm sector. It is envisaged that a close operational link will be formed with the packing houses to which farm produce is delivered. Nevertheless, the ultimate goal should be the privatisation of the distribution of agricultural inputs and supplies.

(iv) Road Improvement: This component will relate primarily to tertiary and arterial roads serving agricultural areas. Improvement will consist essentially of repairs. It is estimated that about 50 miles of new feeder roads will have to be constructed and another 100 miles repaired and upgraded. The road improvement aspect will focus only on those areas having a clear potential for improved commercial agricultural production.

(v) Credit: The direct impact of credit will involve providing incremental capital resources for selected areas of agricultural investments and for relevant support services. Agricultural credit will also be addressed from an institutional strengthening perspective within the context of the project. This will be done by way of staff training and technical assistance.

(vi) Training: The training component will emphasize institutional strengthening in the Ministry of Agriculture and also in other participating institutions. The training component will be defined so as to include arrangements for in-service training, as well as technical assistance in special areas.

1.20 On the basis of preliminary estimates the project cost could be between US$15 million and US$19.0 million, with components broken down a follows:

Item	Cost (Millions of US dollars)
. Marketing Infrastructure and Marketing Information System	5.0 to 6.0
. Land Preparation and Input Supply	2.3 to 3.4
. Renovation of The Bahamas Agricultural Research Centre (BARC) and of the Gladstone Road Agricultural Complex (GRAC)	1.6 to 2.0
. Extension Services	0.6 to 0.8
. Road Improvement and Construction	4.0 to 4.5
. Training	1.0 to 1.5
. Credit	0.5 to 0.8
Total	15.0 to 19.0

1.21 The beneficial impact of the project is expected to be at three levels. Direct economic benefits will accrue in the form of public expenditure savings, improved market deliveries of produce, increased farm output and income and increased net foreign exchange economy. Together these benefits would translate into a monetary value exceeding US$50 million per year on the short term. Indirect economic benefits would be primarily macroeconomic in nature involving the stability on food prices and an improved environment for agricultural investment. Social and institutional benefits from the project will be manifested in such areas as strengthening of the managerial capabilities of related organizations (i.e. Ministry of Agriculture, cooperatives, Bahamas Development Bank, etc), improved land administration systems and some viable socio-economic farm and rural non-farm environments.

C. Terms of Reference and Recommendations for Phase II

1.22 The main objective of the second phase of project preparation will be the completion of the project's feasibility study, according to the format proposed in Annex 5 of this report. In order to accomplish such objectives, the mission will focus its work on the following:

a. to complete the information on the project area on an island-per-island basis, so as to collect a sound data base for the design of the various sub-projects and of the two development

strategies for the Northern and Southeastern Islands, respectively;

b. to complete preparation of the chapter called The Project, by refining the project concept, spelling out in detail the two agricultural development strategies for the Northern and Southeastern Islands, respectively, and by designing each of the subprojects, following or possibly modifying the preliminary list of subprojects presented in Chapter V of this report;

c. to plan the activities and design the institutional arrangements for a smooth and efficient execution of the project, spelling them out in a clear and coherent way in the chapter on project execution in the feasibility study;

d. to carry out the technical, institutional, financial and economic analysis of the project according to the criteria adopted by the Inter-American Development Bank, so as to justify its financing and execution (Chapter on Justification). The mission will carry out all these tasks in close collaboration with the national counterpart team, forming with the latter a single technical team for the preparation of the project.

1.23 Besides performing the tasks specified by paragraph 1.22 above, the mission will assist the Ministry of Agriculture and other participating institutions to get ready for the execution of the project, by helping them make all the legal/administrative arrangements and reorganize their operational units before the implementation of the project begins.

1.24 The mission will take place in early 1989 and will have a total duration of three months. It will be led by a Project Coordinator, and will include another seven external consultants in the following areas of expertise: economics, agronomy, irrigation and drainage, agricultural marketing, road engineering, animal husbandry, and financial and institutional analysis. This team will be matched by a national counterpart team of at least one professional for each area of expertise. The final composition of the national counterpart team will respond to the requirements and demands of the work and will be agreed upon between the Project Coordinator and the Ministry of Agriculture.

1.25 A reputable local civil engineering firm will be hired to undertake the design and planning of all civil construction required by the project, and will present its work according to the specifications of the IDB.

Institutional and Technical Support in The Bahamas during Phase II

1.26 The preparation of a project like the present one requires a good deal of administrative and technical support from the institutions involved specially from the one mainly responsible for the project, the Ministry of Agriculture, Trade and Industry. Most of the pressure and demands which

fall on the technical team and on the institution in charge of the preparation of the project arise from the relatively short period of time within which all the multifarious preparation tasks must be accomplished. Tasks must be performed and proposals must be made, not only on a sound technical basis but also in a timely manner, so that a complete feasibility study may emerge at the end of the preparation period.

1.27 In the case of The Bahamas, these considerations are especially important for two main reasons. Firstly, because of its concept, scope and coverage, this is the first sector-wide agricultural development project to be prepared in The Bahamas, and its implementation will require a substantial amount of reorganization and redeployment of the Ministry's resources and capabilities. The Government of The Bahamas considers that the country's agriculture is at a crossroads; this project could be instrumental in redirecting it toward a completely new era. Secondly, the country's geographical configuration poses natural obstacles to the logistics of the preparation work.

1.28 Moreover, it can never be overly emphasized that, although a team of external consultants may play an important role during the preparation effort, a project like the present one is, above all, a Bahamian endeavour. That is, it must reflect the Government's policies, objectives and commitments towards Bahamian agriculture, but also must be fully understood and internalized by the executing institutions, so that it can have a fair chance of success. The preparation of a technically and economically sound feasibility study is just part - and a small part at that - of a whole project cycle. The crucial part of it is the organization for implementation and the implementation of the project itself.

1.29 The institutional and technical support that the Ministry of Agriculture is expected to provide during Phase II of project preparation is spelled out in Annex 3 of this report.

Chapter II. CONCEPT AND DESIGN OF THE PROJECT

A. The Economic Framework

2.01 The Bahamas enjoy a relatively high degree of economic and political stability. In recent years the economy has consistently registered a rate of growth considered to be among the highest in the Caribbean region. During the 1983-1987 period, for example, the average annual growth rate of nominal GDP was estimated to be approximately 11.0%. Because the rate of inflation is low, the average annual the rate of growth of GDP in real terms for the period 1984-1987 is 7.3%. The structural profile and estimated output performance trend for the 1983-1987 period are presented in Table 2.1 below.

Table 2.1 Major Sectors and Estimated Levels of Output for the Bahamian Economy (Millions of Bahamian Dollars)

ITEM	1983		1984		1985		1986		1987*	
	OUTPUT	%	OUTP.	%	OUTP.	%	OUTP.	%	OUTP.	%
Agric.	80	5	85	4	96	4	111	4	123	4
Indust.	409	23	447	22	471	21	513	20	552	20
Constr.	52	3	58	3	64	3	71	3	80	3
Other**	357	20	389	19	407	18	443	18	472	17
Serv.	1255	72	1486	74	1691	75	1891	75	2128	76
Toursm.	556	32	747	37	925	41	1024	41	1194	43
Commrc.	140	8	143	7	140	6	218	9	216	8
Finance	259	15	278	14	301	13	325	13	369	13
Govrnt.	300	17	317	16	323	14	325	13	349	12
NOM GDP	1744	100	2018	100	2258	100	2515	100	2803	100
Percentage Change		5.5		15.7		11.9		11.4		11.5
Inflation 1\		4.1		3.9		4.6		5.4		5.8

* Preliminary
** Primarily consists of enclave manufacturing and transportation
Source: World Bank Economic Report Estimates
1\ Source: Central BAnk of The Bahamas, Report of March 1988, Table 5.3.

2.02 The data demonstrate that the Bahamian economy is primarily sustained by service industries, which account for about 75.0% of gross domestic output. The directly productive segments of the economy consist primarily of manufacturing, transportation and construction. Transportation and construction are, however, integrally linked with the service sector. Manufacturing accounts for about 10% of annual output but is primarily enclave in character, having very little linkage with the rest of the economy. This sector is dominated by the production of chemical and pharmaceutical products. The petroleum/petrochemical industry, which represented an important component of the manufacturing sector, has been declining progressively since the mid-1980's.

2.03 Tourism, financial services and public sector operations essentially comprise the service sector. Tourism accounts for about 56.0% of the sector and for about 43.0% of gross domestic output. Financial services and government each account for about 13% of GDP. Commerce, which accounts for about 10% of GDP, is essentially supported by the prevailing level of activity in tourism and government. In recent years, there has been a relative decline in the contribution of commerce to domestic economic output, an experience which might be attributable to the openess of the economy and the relatively high level of direct purchases made by Bahamian residents in the United States.

2.04 Contrasting with the domestic output limitations which characterize the productive sector of the Bahamian economy is the very high level of domestic consumption, 60% of which is supported by imports. In recent years, for example during the 1980 - 1986 period, non-petroleum merchandise imports increased sharply, at an average annual rate of about 14.0 percent.

2.05 Similarly, the component of imports comprising foods, beverages and other edible commodities has consistently accounted for about 25% of the value of gross, non-petroleum imports and has increased at approximately the same average annual rate.

2.06 Notwithstanding the centrally important role played by imports in fulfilling aggregrate demand, the Bahamian economy does not suffer from a chronic foreign exchange shortage. Inflow from tourism and financial services has been adequately covering the foreign exchange requirements in recent years. Following a decline of about 1.0% in 1982 - 83, tourism inflows have averaged about an 11.0% annual increase during the past five years, while net earnings from financial services have been fluctuating around $80.0 million dollars per year.

2.07 The disproportionate dependence on tertiary economic activities (i.e., tourism, financial services, commerce and the government sector) underlies the fundamental structural imbalance in the economy of The Bahamas. The economy is therefore considered highly susceptible to external shocks. Thus greater attention should be addressed to the requirements for structural diversification through a more systematic exploitation of domestic resources.

2.08 In this regard, the need to further improve the quality and variety of tourism resort facilities, as well as tourism-related products, while simultaneously forging deeper linkages with other sectors of the economy, has been emphasized in recently enunciated Government policy statements. In fulfillment of these policy goals, high priority has been accorded to projects involving such areas as tourism expansion, the upgrading of relevant infrastructure in the Family Islands, increased private foreign and domestic investments in agriculture and manufacturing, and the development of the fishing industry.

2.09 The Government, also cognizant of the trend towards concentration of economic activities in the Northern (Pine) Islands, has announced plans to introduce legislation which will seek to expand and consolidate incentives to expedite economic and social development among the Family Islands, particularly in the southeast (see map of The Bahamas in Annex 11).

Agriculture

2.10 In The Bahamas, agriculture represents a sector in which there is still considerable scope for improvement and further development. The sector accounts for about 4.0% of GDP, provides about 5% of employment and generates about 20% of non-petroleum exports. The Government of The Bahamas has accorded high priority to agricultural development and has instituted in the past a number of support programmes, including programmes for research and extension, credit and marketing. Nonetheless, a large proportion of the cultivable area in the country still remains unutilized. The annual catches of fish and sea foods are well below maximum sustainable yields, given that The Bahamas has about 45,000 square miles of shallow water and about 25,000 miles of coral bank edges. The forest reserves have also not been adequately tapped. While the country is more or less self sufficient in poultry, it still relies substantially on imports for other meats.

2.11 Agriculture and fishing activities are dominated by small-scale producers. The agricultural sector has in recent years experienced higher-than-average rate of growth in output, due in part to the growth of output in fruits and vegetables for the local market as well as increased output of citrus and papaya for export; but its relative importance in the Bahamian economy is still marginal. Local agriculture supplies 20% of the country's food requirements. As a result, The Bahamas is forced to import most of its food. In 1986 the country's food import bill was US$155 million while agricultural exports amounted to US$22 million.

2.12 In order to improve the agricultural situation, the Government recently adopted a National Food Policy. This policy will, among other things, seek to: ensure an adequate supply of nutritional foods for all Bahamians; reduce, as much as possible, the dependence on imported foods; expand food production for the export market; use agricultural and fisheries development as a vehicle to create employment opportunities, and effect greater linkages between agriculture, fisheries, tourism and other sectors of the economy. However, the ability of the Government to increase

agricultural self-reliance will depend mainly upon the increased substitution of imported fruits and vegetables by local production as well as by the expansion of export production to generate adequate foreign exchange earnings for the import of foodgrains and other necessary food items.

2.13 Agricultural production consists of fruits, vegetables, potatoes, corn, rice, pigeon peas and poultry. The production of basic foodgrains is limited to corn, the cultivation of which is widespread in the Family Islands. It is mainly grown as a subsistence crop for on-farm consumption and is not traded in the formal marketing system as a basic staple for human consumption. Agricultural production is mainly directed to the local market, although citrus fruits and seasonal vegetables are exported. The main agricultural areas include: Abaco and Andros, which are noted for cucumbers; Cat Island and South Eleuthera, for pumpkins and sweet potatoes; North Eleuthera and Grand Bahama, for citrus and papayas; Exuma for irish potatoes and onions; Long Island, for bananas, hot peppers and mangoes; and New Providence and Grand Bahama, where most of the modern livestock projects involving poultry and pigs take place.

2.14 Agricultural output increased substantially from 1982 to 1984. In 1985 production of agricultural products declined, owing in part to a decrease in broiler production. The output of fruits and vegetables rose in 1985 as the production of mangoes, citrus fruits, and potatoes registered large increases. Fruit exports - consisting mainly of grapefruit, Persian limes, lemons and papayas - increased from almost 2,000 short tons in 1984 to about 6,000 short tons in 1985, as fruit trees planted on the islands of Abaco and Grand Bahama in 1980 came into full production. In 1987, the performance of the sector showed mixed results.

Agricultural Marketing

2.15 Since 1967, the Government has assumed responsibility for the marketing of staples, fruits and vegetables throughout The Bahamas by establishing a marketing network. The network takes the form of a centralized Produce Exchange in Nassau linked to seven Packing Houses on the Family Islands. The objective of this marketing scheme is to stimulate agricultural production on the Family Islands through the provision of minimum guaranteed price levels and a permanent reliable outlet for marketed produce. This government-administered marketing and pricing system continues in operation to date.

2.16 The Packing Houses receive and purchase produce of marketable quality from Bahamian farmers at prices that are set weekly by the Department of Agriculture. All produce is graded according to minimum quality standards, usually done for size only. In general, access to the facilities of the Packing Houses is available only to Bahamian farmers. According to Government regulations, non-Bahamian large- scale farms cannot market their produce through this system, unless specifically requested when a shortage of certain commodities becomes apparent. Large-scale farms direct their operations towards export markets (mainly in the US) and do not compete with domestic producers for the internal market. Some 18% of the total estimated value of local production in 1984 was exported.

2.17 In spite of the contributions that the Produce Exchange and the seven Packing Houses have been making to Bahamian agriculture since they were first established, marketing still represents the most severe bottlenek to agricultural development in the country. The Produce Exchange at Potter's Cay, in Nassau, is a twenty-year old building in state of disrepair, where it is not possible to handle adequately the agricultural produce arriving daily from New Providence and the Family Islands. Because part of the cooling equipment is not functioning properly and because of management problems, there is a considerable amount of spoilage and the Produce Exchange operates at a loss. The Packing Houses, in turn, are too few to be able to cover the major producing islands and too small to handle the production of each island.

2.18 On the other hand, the lack of a Market Information System which could advise farmers of what to produce and when, results in recurrent gluts of certain products and additional losses to the government-run marketing system.

2.19 Other support services and infrastructure to agriculture, like input supply, credit, research and extension and roads, are also not provided to farmers at a satisfactory level, contributing in this way to the inexpressive contribution that agriculture makes to the economy of the country.

B. Project Concept

2.20 An analysis of Bahamian agriculture reveals that the sector can be viewed as at a cross roads insofar as its role in national economic development is concerned. While its contribution to GDP and other aspects of economic activity can be considered marginal, the sector possesses the potential to provide that critically important leverage required by the economy to achieve improved structural balance, while concommitantly stimulating continued development and growth. A preliminary assessment of the opportunities which exist to expand the role and the functions of Bahamian agriculture indicates the existence of very few unsurmountable constraints. Important issues for consideration include:

(i) the country utilizes only 18% of the estimated 90,000 acres of lands considered suitable for agricultural use;

(ii) the average annual value of the net foreign exchange food bill is $120 million, the growth rate of which has been about 14% per year over the past five years;

(iii) agriculture seems to provide the most feasible vehicle through which economic development of the Southeastern Islands could be enhanced in the short term; an improved agricultural sector in these islands would undoubtedly serve to reduce migration towards Nassau and Freeport; and

(iv) the country's favourable climatic conditions and its proximity to a major foreign market (the United States) provide excellent possibilities for export agriculture.

2.21 Is is from this perspective that the concept of the proposed project emerges. The ultimate goal of the project is the attainment of an improved structural balance in the Bahamian economy, through the implementation of a well-coordinated set of activities and programmes directed at stimulating the development of the agricultural sector.

2.22 The project will seek to do so by providing the agricultural sector and the institutions involved with the management and promotion of agriculture in the country, with the necessary infrastructure, services and incentives for agricultural development.

C. Project Objectives

2.23 The most immediate project objectives are the following:

- to increase agricultural production to satisfy the domestic market, making the Bahamian economy less dependent on the importation of foodstuffs;
- to make agriculture a more viable alternative particularly for the populations of the Southeastern Islands, so that they can stay in the islands and contribute more to the economic development of the country; and
- to promote export agriculture in order to improve the country's agricultural trade balance.

2.24 The project will address the main problems and obstacles which are presently hindering agricultural production and development, through a set of activities or sub-projects directed towards the following areas:

(i) Marketing (Infrastructure and Channels)

(ii) Marketing Information System

(iii) Research and Extension Services

(iv) Land Preparation and Input Supply

(v) Road Improvement

(vi) Credit

(vii) Training

Chapter III FRAME OF REFERENCE FOR THE PROJECT 1\

A. Overview

3.01 The Commonwealth of The Bahamas is an archipelago of over 700 islands and cays extending over an area of more than 100,000 square miles (259,000 sq. km). Most of the territory, therefore, is water, the land area being estimated at only 5,382 square miles (13,939 sq. km) or 5% of the territory. Although located in the North Atlantic, The Bahamas shares many characteristics with the islands of the Caribbean, especially with regard to soils and climate.

3.02 Based on characteristics of land types, soil capabilities, water resources and vegetation, the archipelago is divided into two groups of islands. The Pine Islands of the North (Grand Bahama, Abaco, New Providence and Andros) and the remaining Coppice (hardwood) Islands of the Southeast (see map in Annex 11). A survey of land resources carried out during the early seventies, with United Kingdom technical assistance, provides basic qualitative data for the characterization of the islands 2\. Rainfall, which averages about 52 inches annually for The Bahamas as a whole varies from 62 inches for the Pine Islands to 35 inches for islands in the Southeast. Because of the porous nature of the soils, there are no fresh water rivers or streams in The Bahamas. On most of the larger islands, the water table is very near the surface. This provides relatively easy access to potable water, but, given the proximity of sea water, there is always the danger of salt-water intrusion from overly rapid extraction. The largest fresh-water deposits appear to be on Andros, from which water is barged to New Providence to supplement that island's supply to Nassau.

3.03. The country's total population in 1987 was estimated at 242,000, which gives a population density of 17.3 persons per square kilometre (45 per sq. mile), one of the lowest in the Caribbean. This figure, however, conceals a very uneven distribution of the population among the islands. It is estimated that around 83% of the total population is concentrated around just two cities: Nassau (66%) on the island of New Providence, and Freeport (17%) on the island of Grand Bahama. The other 17% of the population is scattered throughout 27 islands, with populations ranging from 50 to 8,000.

3.04. While the overall population is relatively young, literate and economically active, the age, sex, and employment structure varies markedly among the islands. For the most part, the less developed islands (particularly the ones in the south) display a population structure characterized by the presence of older people and a low percentage of working-age males, which reflects the patterns of migration towards Nassau

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1\ Sections of this chapter were adapted from the recently prepared IDB document, Multisector Global Credit Programme, (Bahamas Development Bank) Project Report, IDB, Washington D.C., 1988.

2\ Land Resources Division, Ministry of Overseas Development, U.K., Land Resources of The Bahamas: A Summary, 1977.

and, to a lesser extent, towards Freeport. These internal migration patterns, in turn, reflect the lack of economic opportunities on the Family Islands, in general, and on the Southeastern Islands, in particular.

3.05 The main assets of the Bahamian economy - which the country shares with the rest of the Caribbean - centre around its potential for tourism: beautiful beaches, ideal weather, and proximity to a major market. Moreover, the Bahamian economy has been historically an open economy, with its related tax-haven policies, which have resulted in the mushrooming of a major international financial centre and the development of export-oriented services such as refinery and trans-shipment activities. Nevertheless, the country needs to address a number of issues related to its development prospects: (i) tourism and financial services account for 85% of the country's GDP, which makes the economy too dependent on these two sectors; (ii) also, tourism and financial services are concentrated around two cities, Nassau and Freeport, making them very attractive to the population of the other islands, especially the young population; (iii) the size and geographic dispersion of the country pose considerable logistic obstacles to development; (iv) apart from some salt and calcium-based minerals, the country lacks mineral resources; (v) water and arable land are relatively scarce; (vi) in order to keep all the islands inhabited, especially the ones in the southeast, the Government has to create economic opportunities outside Nassau (New Providence) and Freeport (Grand Bahama) which are sufficiently attractive to keep the young population in the Family Islands.

B. Recent Economic Performance and Outlook

3.06 Economic activity in The Bahamas expanded at an accelerated pace during 1987, enhanced by rapid growth in tourism during the first half of the year and a surge in consumer spending during the second half. The resulting strength in aggregate demand throughout the year stimulated continued rapid growth in trade and in the construction sector, especially in commercial construction. Agriculture and manufacturing, however, did not appear to benefit significantly, as the increase in demand in these sectors was offset to a large extent by rapidly rising imports. This resulted in a substantial net international reserve loss by the end of the year and provoked measures by the monetary authorities to slow credit growth.

3.07 The tourism sector, which generates about one-third of GDP, continued to be the principal stimulus to economic activity. Total tourist arrivals grew at close to a 10% rate during the first half of 1987, although growth slowed substantially in the third quarter. Fourth quarter arrivals were well below those of the previous year, as the dramatic events in the United States financial markets affected year-end vacation plans. Most of the decline, however, was in respect to cruise ship passengers, who contribute far less to economic activity than stop-over visitors.

3.08 The result for the year was a 3.6% increase in total foreign arrivals to a record 3.1 million visitors, while air arrivals (primarily stop-over

visitors) were up by 5.6%, and tourist expenditures rose by an estimated 7% over 1986. All of the growth, however, was concentrated in Nassau and Freeport, as the Family Islands registered a decline in visitor arrivals compared with 1986.

3.09 There was also a shift in the origin of visitors during 1987, due principally to the depreciating United States dollar (to which the Bahamian dollar is tied), which stimulated close to a 50% rise in European visitors, who traditionally represent less than 5% of stop-over visitors.

3.10 The strong tourism performance through mid-1987 stimulated continued growth in the construction sector, which registered a 20% rise in the value of permits issued and a 9% increase in construction starts in 1987. This does not include the $150 million Crystal Palace Hotel project on Cable Beach in Nassau, which started during 1987, in response to the rapid growth in consumer spending. Residential activity appears to have leveled off somewhat.

3.11 The manufacturing sector, which is dominated by a few large export firms on Grand Bahama, did not do as well in 1987. Manufactured exports were down some 14% as the petroleum refinery remained closed throughout the year due to technical/financial problems, as well as world market conditions. Furthermore, one of the two chemical/pharmaceutical plants was closed for most of the year as part of an ownership transfer and retooling process. While there appears to have been some growth in the number of small manufacturers for the domestic and tourist market, no data are available regarding output levels, which appear to be relatively low.

3.12 Agricultural performance was mixed in 1987, with poultry production continuing to expand at a good pace in response to strong domestic demand and tariff incentives, while citrus production and exports again rose rapidly as new acreage came into production. Field crop production appears to have shown little change from 1986, while livestock output fell by an estimated 8%, as consumers continued to demand higher quality imported products, and the shortage of sanitary slaughtering facilities limited production.

3.13 The financial system apparently played an important role in maintaining the level of economic activity during the second half of 1987 when tourism growth was slowing. The strong tourism growth during the first half was accompanied by rapid growth in international reserves and the money supply, a modest decline in outstanding banking system credit, and excess reserves in the system. Partly in response to this situation, around mid-year a major banking organization launched an aggressive campaign to expand its consumer lending, which stimulated a competitive response in other commercial banks and a rapid (20 percent) increase in credit to the private sector during the second semester.

3.14 The rapid growth of consumer credit, combined with a high level of commercial construction, the high import content of expenditures, and the slowdown in tourism earnings growth later in the year contributed to a rapid loss of net international reserves. These fell by some 40% from their peak in late May to an estimated $174 million by year's end, equivalent to only 5-6 weeks of imports. In order to slow the growth of consumer credit

and halt the reserve loss, the authorities raised the discount rate from 7.5 to 9 percent in January 1988, and established a ceiling on deposit interest rates.

3.15 The reserve loss reflected a substantial deterioration in both the merchandise trade accounts and the capital account of the balance of payments. The poor performance of the export manufacturing sector resulted in an estimated 14% fall in merchandise export earnings, despite increased sales of citrus products. With imports up by 10% for the year, the merchandise deficit increased by 20%, or $148 million, more than offsetting the $60 million gain in tourism earnings. The result was an increase in the modest current account deficit recorded in 1986, from less than 1 percent to more than 5 percent of estimated GDP. At the same time, the capital account also deteriorated sharply, with net outflows recorded on both private and public sector accounts. In the case of the public sector, amortization payments on the loans for the Cable Beach Hotel development replaced the net drawings resulting from a major debt refinancing arranged in 1986.

3.16 The fiscal situation remained relatively stable during 1987, with strong growth in import duties partially offset by a drop in non-tax revenues, so that total revenues just kept pace with estimated GDP growth. Current outlays rose somewhat more slowly, despite faster growth in personnel costs. Capital spending recorded the fastest growth, although it reached only an estimated 2.1 percent of GDP.

Outlook

3.17 The key to the medium-term growth prospects of The Bahamas is the dynamism of the tourism sector, which provides the bulk of foreign exchange earnings and sustains a large segment of the domestic economy. The turmoil in the United States financial markets is likely to have induced a slowdown in tourism expenditures in 1988, while increased competition from lower-priced Caribbean destinations is likely to make it more difficult for The Bahamas to maintain or increase its market share over the medium-term. In addition, the consumer spending and commercial construction boom of late 1987 will put pressure on foreign exchange availability and banking system liquidity over the near term, so that the overall recorded growth for 1988 could turn out to be modest. However, improvements in industrial activity and continued growth in citrus exports may alleviate the foreign exchange shortage somewhat and help to sustain modest real growth.

3.18 Beyond 1988, several major hotel, airport and harbor construction or expansion projects currently under way, plus planned strengthening of the Government's sophisticated tourism marketing programmes, should contribute to continued growth in tourism and the economy as a whole. At the same time, plans to improve transportation facilities and stimulate investment in tourism, agriculture and fishing in the Family Islands should help to ensure that growth and its benefits are more widely distributed among the population.

3.19 Investment in agriculture seems to be particularly important because, if it does not come about, the country will remain increasingly dependant

on the importation of food, and also will be unable to stop the out-migration from the Family Islands. The project being proposed in this report addresses both issues.

C. Social and Economic Development Objectives

Economic Policies

3.20 The re-election of the incumbent government in mid-1987 assured the continuation of economic policies oriented toward providing a basic economic and social infrastructure and policy environment conducive to increased private sector investment with emphasis on job creation and foreign exchange generation. In order to maintain its position as an important offshore financial center and tax haven, considerable importance is attached to maintaining political, economic and financial stability. Therefore, fiscal and monetary policies are carefully aimed at maintaining stable prices and the existing exchange rate arrangement.

3.21 In its "Speech from the Throne," delivered to the opening of Parliament in September 1987, the Government laid out its principal objectives and policy orientations for its five-year term of office. The speech gave renewed emphasis to tourism development throughout The Bahamas, with stronger linkages to other industries. Some $100 million a year is to be spent over the next four years on tourist facilities on New Providence, which is expected to create some 3,000 permanent jobs in the tourist industry alone. Tourism expansion is also planned for several of the other islands, with government emphasis on improving transportation infrastructure and promotional activities. A major international airport is now under construction on Exuma with CDB/IDB funding, to serve the southern islands. The Government plans to introduce a Family Islands Development Bill to expand and consolidate incentives for the economic and social development of other islands.

3.22 High priority is also accorded to development of the fishing industry, as well as to promoting both foreign and domestic investment in industrial activities throughout the islands, with additional incentives to produce for the domestic market. The Bahamas Development Bank will be expanded to support local investment in agriculture, manufacturing and tourism. Education, health and housing will continue to receive priority attention over the next five years, with particular attention to adapting the educational system to the changing needs of the economy.

3.23 During 1987, the authorities made further efforts to attract additional ship registration and offshore insurance business, with some success; at the same time, offshore banking continued its modest growth, reaching a total of some 380 banks and trust companies licensed to operate in The Bahamas. A significant achievement was an agreement in principle with the United States government on the Mutual Legal Assistance Treaty, which provides for cooperation in criminal matters without sacrificing the principle of bank confidentiality. This is considered vital to The Bahamas' success as an offshore financial centre.

3.24 The Government is particularly interested in creating the conditions for development to take place in a balanced way, both in terms of the social groups and the areas to be benefited. Accordingly, much attention will be given to the development of the islands of the southeast, to enable their populations to pursue economic activities which are attractive enough to stop their migration towards Nassau and Freeport.

D. The Institutions

3.25 The Bahamian institutions most closely involved with agriculture are the Ministry of Agriculture and its affiliated institutions; the Bahamas Agricultural and Industrial Corporation (BAIC); and The Bahamas Development Bank (BhDB).

The Ministry of Agriculture, Trade and Industry

3.26 The Ministry of Agriculture, Trade and Industry is the principal government institution responsible for the development of agriculture, fisheries and the rural sector in the Commomnwealth of The Bahamas. Its principal functions are to plan, promote, develop and control agricultural production, fish and seafood production and rural development within the country. The Ministry was originally established under the Agriculture and Fisheries Act. (1963 Chapter 25, Bahamas Statutes). The Act, which has been amended several times since its enactment, confers broad authority on the Ministry to promote the development of agriculture and fisheries in The Bahamas.

3.27 In response to the Government's drive and commitment toward increased food production and its amplification of duties and responsibilities, the Ministry is reviewing the need for its reorganization along more functional, and possibly more decentralized lines. The main thrust of the proposed reorganization is to expand its role in planning and programming as well as to redeploy available personnel in order to provide the necessary marketing, research, extension and credit services to the food production sectors throughout The Bahamas.

3.28 Besides its operating departments, the following institutions within the Ministry are closely related to agricultural development in the country:

- The Bahamas Agricultural Research Centre (BARC), on Andros Island;
- The Gladstone Road Agricultural Complex (GRAC), on New Providence;
- The Produce Exchange and Packing Houses;
- The Fish and Farm Store, on New Providence.

3.29 Although this report describes the organization and functions of some of these institutions, a complete institutional analysis of the Ministry itself as well as its affiliated institutions will be carried out during Phase II of project preparation.

The Bahamas Agricultural and Industrial Corporation (BAIC)

3.30 To encourage investment in the country, The Bahamas Agricultural and Industrial Corporation (BAIC) was established in 1981 as a central agency to assist all potential private investors desiring advice on investment opportunities. BAIC is responsible for promoting industrial and agricultural development and providing infrastructural support. BAIC utilizes the United Nations (UNIDO) investor search networks based in New York and is developing a variety of project profiles for manufacturing activities as well as an investment guide.

3.31 The Government, through BAIC, is also promoting the development of small-and medium-sized industries by developing additional factory space, intended to create a framework for new export-oriented, labour-intensive industries. In 1986, the Caribbean Development Bank (CDB) approved a loan to the Government for the equivalent of US$1.7 million to assist in the construction of 59,000 square feet of factory space at the Soldier's Road Industrial Park in New Providence.

3.32 BAIC will doubtlessly play an important role in promoting agriculture for the export market within the framework of the project, and it is likely to participate in some other way in the execution of the project. The specific tasks and responsibilities to be asigned to BAIC will be defined during the second phase of project preparation. A complete institutional analysis of BAIC will also be undertaken during Phase II.

The Bahamas Development Bank (BhDB)

3.33 The Bahamas Development Bank is a statutory corporation created by an act of The Bahamas Parliament in 1974; operations only commenced in July, 1978. 1\ BhDB is a corporate body having perpetual succession. BhDB is under the direction and supervision of the Ministry of Finance; the Government through the Ministry of Finance, has final control over the policy and administration of BhDB.

3.34 Under its statutory mandate, the BhDB has the following objectives:

a) to promote industrial, agricultural and commercial development in The Bahamas through the financing of, or the investing in approved enterprises;

b) to encourage the participation in approved enterprises by citizens of The Bahamas; and

c) generally, to promote and enhance the economic development of The Bahamas.

1\ The Bahamas Development Bank Act, 1974 (October 18, 1974)

3.35 To discharge these functions, the BhDB is granted broad statutory powers which include, inter-alia, power to:

a) provide finance in the form of loans, (long, medium or short-term) or by the purchase of securities or by participating in any share issue of any approved enterprise;

b) obtain funds from international agencies, financial agencies of the government of countries outside The Bahamas, banks, other financial institutions or the public for the purpose of relending such funds within The Bahamas;

c) invest money standing to the credit of the Bank by way of loans, the purchase of securities, participation in any share issue of any approved enterprise or in such other manner as the Bank may from time to time think proper;

d) guarantee loans from other investment sources to persons wishing to establish or modernize any approved enterprises; and

e) act as agents for the sale and purchase of any shares or securities or for any other monetary or mercantile transaction.

3.36 In accordance with stated Government policy, BhDB gives priority to agriculture and fisheries, tourist facilities and light industry. Small locally-owned businesses, especially in the Family Islands, and registered cooperative societies in these sectors are to be given special attention.

3.37 BhDB will very likely participate in the execution of the project, more specifically of its credit sub-project. Phase II of project preparation will define that participation and undertake a full institutional analysis of the Bank.

E. The Project Area

The Two Project Subareas

3.38 The project will cover 11 of the 14 main islands of The Bahamas archipelago. 1\ Therefore, reference to the project area relates, in practical terms, to the country as a whole. The reason for having a special section devoted to the project area arises from the marked differences that can be found between the Northern and the Southeastern Islands and, consequently, between the different development approaches that will be adopted to deal with these two groups of islands.

3.39 The islands of The Bahamas have traditionally been classified in terms of their vegetation: the Pine Islands of the north and the Coppice

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1\ The major islands not covered are San Salvador, Rum Cay and the Inaguas.

(hardwood) Islands of the southeast. For purposes of this project, however, the islands have been divided in two groups - Northern and Southeastern - because one of the Coppice Islands, Eleuthera, shares many characteristics with the group of four Pine Islands (Grand Bahama, Abaco, New Providence and Andros). The two groups of participating islands are, then, as follows:

Northern Group -	Grand Bahama
	Abaco
	Eleuthera
	New Providence
	Andros
Southeastern Group -	Cat Island
	Long Island
	Exuma
	Crooked Island
	Acklins
	Mayaguana

3.40 The Northern Islands present much more favorable conditions for commercial agriculture than the Southeastern Islands, especially in terms of soils, water availability and proximity to markets. It is there that most of the economic potential of Bahamian agriculture can be realized.

3.41 The Southeastern Islands, in turn, despite their lesser agricultural potential, are very important and represent a high priority in the country's overall development strategy. Settlement of these islands and their economic viability are vital for the country to preserve its territorial integrity and socio-economic balance.

3.42 Nassau, the capital city is located on the island of New Providence; and Freeport, the other main city, located on Grand Bahama, are the two poles of attraction for internal migration from the Family Islands, especially for the younger persons. It is around Nassau and Freeport that most of the tourism industry is centred, which causes an economic and spatial imbalance in relation to the rest of the country.

3.43 In its overall design, the project will seek to address not only the differences between the Northern and Southeastern groups of islands, but also the peculiarities of each island within each group. At the same time, the project will aim at reflecting the Government's strategy for the development of the country as a whole.

Physical Characteristics

3.44 A detailed account of the physical characteristics of The Bahamas is presented in Annex 7 of this report. It is based on The Bahamas Land Resource Survey, conducted by Little et. al. during the 1970's under a British government technical cooperation programme and was adapted from the

National Food and Nutrition Action Plan prepared by the FAO in cooperation with the Ministry of Agriculture of The Bahamas. What follows is a summary of the contents of Annex 7.

Vegetation

3.45 The most obvious distinction between the islands concerns vegetation and has led to the division between the Pine Islands and the Coppice (hardwood) Islands. The Pine Islands have natural forests of Caribbean pine and generally a wetter, cooler climate. The pine forests occupy the soily rock plains, and the size of the timber is a useful indicator of the agricultural potential of the underlying land.

3.46 The remaining islands in the southeast were originally covered with hardwood forests and shrubland. Continuous occupation and exploitation over several hundred years have reduced this to closely spaced stands of narrow-stemmed, semi-deciduous and evergreen broad-leaved trees, often only 10 to 15 feet (3-4.5 metres) high and which rarely exceed 35 feet (10 metres). The density and size of this woodland varies according to the quantity and seasonality of the rainfall, so that in the southeast it is reduced to sparse cover, more closely resembling thorn woodland or desert scrub than the more abundant cover of the wetter central islands.

Rainfall

3.47 In the Northern Islands the rainfall pattern is characterized by high annual falls which are unevenly distributed between a warm, wet summer season from May to October and a dry, cooler winter from November to April. The four northernmost islands all have between 50" and 60" rain per year. In contrast, the four southernmost islands are the driest, with 45-55% of that amount, or 27.5" to 35.7" per year.

3.48 Most of the summer rain in The Bahamas falls in intense local storms which can produce wide variations in incident rain at close locations and which create local problems for producers. There is the difficulty of maintaining steady growth in crops when rainfall occurs in brief, high-intensity storms followed by periods of dry weather. The soil and base rock are receptive to intense falls of rain and there is little runoff, so moisture is rapidly lost to the plant.

Temperature

3.49 A most important feature for Bahamian agriculture is the remarkably stable temperatures year round and the complete absence of frost. Mean daily temperatures in New Providence vary between a maximum of 77 F to 89 F. and a minimum of 62 F to 75 F. In Great Inagua, maxima can vary between 82 F. to 91 F., but minima are virtually the same as New Providence, in the range 67 F. to 76 F. These two islands reflect the temperature ranges observed in the Northern and Southeastern Islands, respectively.

3.50 Mean relative humidity varies between 75% and 82% in New Providence and marginally higher, at 79% to 88%, in Great Inagua. This figure conceals the fact that absolute humidity is much lower in the winter (Dec-Mar) period, which makes this an ideal period for production of many temperate food crops, particularly vegetables. Moving from winter to summer (May-Sep), with much higher humidity and rainfall, it becomes much more difficult to produce the same group of crops. This is because of higher susceptibility to disease in the more humid atmosphere, and the prospect of crop damage from excessive rain.

3.51 The absence of frost-because of the small land mass of each island, is a unique feature of The Bahamas. When coupled with an average of 7 hours of sunshine/day year round and the mild moist atmosphere, The Bahamas have a production advantage over many other locations which can produce similar crops, but only on a seasonal basis. The close location of The Bahamas to mainland USA, and the regular transport connections to Canada and Europe provide specific market opportunities to capitalize on the beneficial climate for agricultural production.

Wind

3.52 Prevailing winds throughout the islands are from the easterly quarter. In the northerly sector, the prevailing winds are from the northeast from October to April. Although mean wind speed is in the range of 7-10 knots, it is not uncommon to have periods during the winter with wind speeds of 15 knots or more. Moving southward, the period of northeasterly winds becomes shorter and less pronounced, so that in the southernmost islands the predominant wind direction is east-southeast all year.

3.53 Wind creates some specific problems for farmers. There is the loss or damage of fruit and flowers, the breaking of fruit laden boughs or overturning of loosely rooted plants such as bananas, and the loss of soil and plant moisture through the evaporative effect of wind. Various defenses are adopted against the wind problem. Trees, especially bananas, are planted in deep potholes or in deliberately small clearings in the scrub. Multi-story cropping is adopted, with bananas, citrus and vegetables grown together, to increase the density of plant material and, hence, reduce the potential for wind damage. In large vegetable farms, fields are broken into narrow rectangles by growing dense tall plants such as sugarcane as windbreaks. In The Bahamas there is also the specific problem of hurricanes.

Hurricanes

3.54 While they are not exceptionally frequent, the potential for hurricane damage should be taken into account for long-term agricultural planning. Little et. al (1977) cite data over a 92- year period from 1871 to 1963. As shown in Table 3.1 it is significant that Grand Bahama with its otherwise high potential for tree crops has double the chance of hurricane damage compared to Abaco or Andros. In Abaco there is a

permanent citrus/avocado orchard more than 18 years old, with a strong history of regular high production.

3.55 A major consideration when one embarks on tree crop production is the need to select with care orchard sites laid out in a manner that minimizes possible hurricane damage. Part of any overall plan to mitigate hurricane damage should be the maintenance of national mother stocks of the principal commercial tree plants, which should include improved varieties of citrus, mango, avocado and papaya.

TABLE 3.1 Incidence of Hurricanes in The Bahamas - 1871/1963

Island	Number passing across an island	Number passing within 200 nautical miles
Abaco	8	91
Grand Bahama	16	70
Andros	9	90
Eleuthera	6	85
Cat Island	7	39
Exuma	5	45
Long Island	7	45
Crooked Island, Acklins	9	45
Mayaguana	5	45
Great Inagua	3	45

Source: Little et. al. Table 2., page 7

Soils and Landform

3.56 The landforms in each island are a composite of dunes, beach ridges, marshes and plains, some of which are actively forming and others are in various stages of decomposition from prior ages. With the highest point on land being 207 feet (63.7 m) above mean sea level, micro relief and local conditions are important in determining suitable locations for agriculture in The Bahamas.

3.57 Virtually all the land is limestone-based, though the limestone is by no means uniform in structure, density or strength. The limestone varies according to origin and age, the most important variations being in the type of limestone and degree of hardness. The soluble nature of limestone means that most of the soil is eventually lost in the normal degradation process, and that natural soils are thin and of little structural strength. They are strongly alkaline, of low natural fertility and have a high capacity to lock up applied fertilizer.

3.58 Little et. al. (1977) suggest that observed soil differences may be related to minor differences in the base limestone. They describe four general classes of soils:

(i) Limestone Residues (Red and brown lateritic soils) with two sub-classes: Aluminous Lateritic Soils ("red soils", "pineapple soils", Bahamas red loam" and Immature Lateritic Soils ("Brown mineral soils", "Bahamas stony loam");

(ii) Organic Soils (Leafmould soils on rock, muck soils);

(iii) Sedimentary Soils (Sandy soils with humus, sandy soils with caliche; limesilt soils);

(iv) Man-made soils (Quarry pit soils, artificially augmented soils of Exuma, heaped up marsh soils of North Eleuthera, prepared rockland, crushed rock

Land Capability Classification

3.59 Annex 7 of this report presents a Land Capability Classification devised by Little et. al. (1977) in order to draw together the results of their various analyses of the land, soil and water situation in The Bahamas. In summary, the classification is:

Tillage Land:

Class 1:	Small individual area of deeper red and brown soils together with "whitelands" (humic sands)
Classes 2 and 3:	Intimate associations of soil and rock (occupying the top 3-18 inches of the ground surface) suitable for preparation as ploughland; Class 2, gravelly; Class 3, stony.

Non Tillage Land:

Classes 4, 5, 6 and 7 (See Annex 7 for detailed description)

3.60 Practically, all the land which can be used for agriculture falls into Classes 1-4A. In the Land Capability Map published with their report, Little et. al. (1977) provide some estimates of the areas of the various land capability classes for the principal islands. The most obvious feature of the data is the predominance of agricultural class land in the three islands of Abaco, Grand Bahama and Andros. Of the estimated total of 164,094 acres, some 132,152 acres, or 80.5%, are found on these three islands. By comparison, Eleuthera and Cat Island, which have historically been big suppliers of farm produce to New Providence have only an estimated 9,127 acres, or 5.5%, of the agricultural land of the principal islands of The Bahamas. Table 3.2 below presents data on the distribution of agricultural land by island.

TABLE 3.2 Comparison of Estimated Area of Class 1 to 4A Agricultural Land by Island

Abaco	Grand Bahama	Andros	Eleu thera	Cat Isl	Exm	Crkd Ackl	May Ina	Total
				(Acres)				
Land Area								
415,344	339,189	1,471,948	127,995	95,995	46,078	84,478	483,182	3,064,209
Class 1-4 Agric Land								
45,355	35,608	51,189	7,289	1,838	305	6,500	16,010	164,094
% Class 1-4 Land								
10.92	10.50	3.48	5.69	1.91	0.66	7.69	3.33	5.46

Source: Little et. al. (1977) and FAO Report.

3.61 The obvious implication of the above data is that there are not only greater areas of usable land in the Northern Islands, but also a greater proportion of usable or better class land in these islands. Overall land area does not however provide a criterion of agricultural capability. No island has more than 11% of its area as agricultural-class land, and none of the traditional agricultural islands exceed 5.7% of their area as Class 1-4A land.

3.62 Land preparation represents a critically important factor in Bahamian agriculture, since it can be expensive, specially in the case of the Southeastern Islands. Phase II of project preparation will have to update the information on land use for each island included in the project, as well as develop estimates for the costs of land preparation in both project sub-areas.

Water Resources

3.63 The ground water resources of each island is a critical factor in this type of agricultural project. Arising from the Land Resource Survey (Little et. al., 1977), some assessment of the ground water resources are summarized as follows.

Eleuthera

There is a history of bad management of the island's water resources. Given the long thin character of the island, a distribution system would be necessary and a balance between water for domestic purposes and that

slated for agriculture would need to be established. The recommended abstraction rate is 490 gallons per day per acre (gpd/ac).

Andros

Possesses the best fresh water resources of all the islands. The possibility of large scale mechanized farming is good. The recommended abstraction rate is 570 gpd/ac.

New Providence

Water resources here are of major concern because of its substantial population. Special studies have been undertaken but results are not complete.

Abaco

It possesses good fresh water resources given that the quantity surpasses the local demand and extensive ground water development is possible. For a distribution scheme, limited piping would be necessary. The recommended abstraction rate is 680 gpd/ac.

Grand Bahama

There is a strong suspicion of biological and chemical contaminants in the ground water supply but this needs further study. There are good fresh water resources except for some limited stretches on the island. The construction of the Grand Lucayan Waterway has resulted in the loss of large volumes of fresh water.

Long Island

This thin long island is dependent on roof catchments and tanks. The water lenses identified do not meet the island's demands for domestic water. Water for agricultural purposes seems almost out of the question at this stage and the selection of suitable crops for rainfed conditions will be a priority. The recommended abstraction rate is 300 gpd/ac.

Cat Island

The reserves seem adequate for local domestic demands. With its long thin shape, piping would be needed to effect water distribution. The recommended abstraction rate is 360 to 460 gpd/ac.

Exuma

Despite its low annual rainfall the island is well endowed with fresh water. Some pumping would be necessary to different settlements. The recommended abstraction rate is 400 gpd/ac.

Acklins

The main fresh-water supply areas are adequate to support a moderate tourist/agricultural industry. It is anticipated that a distribution system would be costly in terms of capital costs. The recommended abstraction rate is 250 gpd/ac.

Crooked Island

Against the background of limited rainfall, fresh-water resources are quite limited even for domestic purposes. Roof and cistern catchments will likely to be necessary. The recommended abstraction rate is 290 gpd/ac.

Mayaguana

Against the background of a low annual rainfall there is limited fresh-water. A single water lense of substantial adequacy has been identified but much piping would be needed to effect transport to different areas. The recommended abstraction rate is 300 gpd/ac.

3.64 Having dealt with the underground water resources, the following is pertinent in the context of PHASE II of the preparation of the project.

(i) With the limited overall water resources for The Bahamas and the different patterns on the islands, the project preparation mission will require the consulting services of an expert in hydrology and irrigation. This would provide base data needed in projecting farming systems and crops to be produced.

(ii) A very serious concern is the fact that most pest and disease control now dependent on imported technology requires, over a period of time, massive doses of insecticides, fungicides and other chemicals. The possibility of environmental pollution is real and the limited water supplies will need much protection. Some concern has already been expressed for Grand Bahama, and New Providence is of major interest, given its large and concentrated populations.

Chapter IV THE AGRICULTURAL SECTOR

A. Agricultural Production

4.01 Agricultural production in The Bahamas consists mainly of fruits, vegetables and poultry directed to the local market, although citrus fruits and seasonal vegetables are exported. Other agricultural commodities produced in the country consist of potatoes, corn and pigeon peas. Corn is grown as a subsistence crop for on-farm consumption and is not traded in the formal marketing system. The main producing islands are Abaco, Andros, Eleuthera, Grand Bahama, New Providence, Cat Island and Long Island.

4.02 Table 4.1 below shows the estimated value of agricultural production in The Bahamas from 1981 to 1985 in current Bahamian dollars.

Table 4.1 Agricultural Production
(Millions of Bahamian $)

	1981	1982	1983	1984	1985
Fruits and Vegetables	6.0	7.0	8.8	12.0	13.4
Poultry	19.6	15.1	17.1	20.9	20.0
Meats	0.7	0.7	0.8	0.7	0.6
Dairy	0.6	-	-	-	-
Total	26.9	22.8	26.7	33.6	34.0

Source: Ministry of Agriculture, Commonwealth of The Bahamas

4.03 From 1981 to 1982, agricultural output decreased by around 15%, mainly because of a decrease in poultry and citrus production, but in 1983 it returned to its 1981 level and also showed significant increases in 1983 and 1984, principally because of a recovery in broiler production.

4.04 Total exported agricultural production from The Bahamas includes marine products, fruits and vegetables, and some forestry products (cascarilla). Marine products (crawfish and salt) account for most of the

export value. Fruits and vegetables have been experiencing a sharp increase in recent years because plantations in Abaco and Grand Bahama are now coming into full production.

4.05 Although detailed information on production, by item and by island, was not available, the following table provides a good estimate of agricultural production in the country. Table 4.2 presents information on the amount of produce purchased by the Produce Exchange and the Packing Houses during the period 1985-1987.

Table 4.2 Purchases of Selected Produce Items by the Produce Exchange and Packing Houses for the Years 1985-1987 (Short tons)

Produce	1985	1986	1987
Sweet Oranges	232	307	253
Grapefruits	13	30	34
Persian Limes	374	118	110
Tangerines	89	25	52
Avocadoes	13	20	34
Bananas	1,078	640	449
Pineapples	327	426	351
Watermelons	576	378	282
Irish Potatoes	132	228	479
Sweet Potatoes	21	28	4
Green Pigeon Peas	2.5	-	1
Dry Pigeon Peas	29	21	9
Tomatoes	1,054	904	927
Cabbages	208	413	738
Sweet Peppers	310	106	90
Cucumbers	73	77	34
Onions	262	183	379
Dry Corn	110	280	154

Source: Ministry of Agriculture, Commonwealth of The Bahamas

4.06 Most of the items appearing on Table 4.2 have good market potential, since they supply only a fraction of total demand. Table 4.3 presents total demand for selected fruits and vegetables by source of origin, in 1986. It can be appreciated that the only products that succeed in satisfying most of the domestic demand are pineapples (93%), watermelons (79%) and bananas (76%).

Table 4.3 Domestic Purchases and Imports of Selected Fruits and Vegetables - 1986

Produce	Unit	Domestic Purchase	Imports	Total Demand	Domestic Purchases as a % of Total Demand
Avocadoes	case	1.105	10.460	11.505	9.6
Bananas	case	45.026	14.166	59.192	76.1
Lemons/Limes	case	7.707	35.901	43.608	17.7
Oranges	case	26.934	83.172	11.020	24.4
Pineapples	case	24.564	1.856	26.420	93.0
Watermelons	case	12.394	3.296	15.690	79.0
Grapefruits	case	6.543	60.793	67.336	9.7
Plantains	case	173	69.702	69.875	0.3
Cabbages	bags	15.518	63.226	78.744	19.7
Cucumbers	case	5.567	7.404	12.971	42.9
Onions	bags	8.603	179.018	187.621	4.6
Sweet Peppers	case	10.283	35.674	45.957	22.4
Tomatoes	case	81.066	99.041	166.596	40.6
Cassava	bags	707	7.364	8.071	8.8
Irish Potatoes	bags	7.031	238.083	245.114	2.9
Sweet Potatoes	bags	1.373	33.441	34.814	3.9
Yams	bags	36	11.662	11.698	0.3

Source: Ministry of Agriculture, Commonwealth of The Bahamas

4.07 The information presented in the previous tables show very clearly that the potential for agriculture in The Bahamas lies in the production of fruits and vegetables. Their comparative advantage can be assessed from the fact that (a) they compete favourably in the local market with the imported produce in terms of quality and price, since they are graded according to international standards and do not receive any price subsidy, and (b) large investments are presently being made by foreign and joint-venture companies in the area of citrus production for export. At the same time that there is ample room for increased production and import substitution in the domestic market, export agriculture will continue to expand, by this way contributing towards diminishing the country's present net food bill, which reached $120 million in 1988.

Livestock

4.08 The value of livestock products imported by The Bahamas during 1986 was approximately $60 million. Domestic production is difficult to quantify since there is no formal marketing system for livestock. Some data is provided by the Agricultural Census of 1978 (Table 4.4). It shows cattle and pigs dominating in the Northern while sheep and goats are more common in the Southeastern Islands.

4.09 Grazing livestock in The Bahamas consists of sheep, goats and cattle. Cattle are not widespread but the constraint on feed supply resulting from a lack of native grasslands creates circumstances which are naturally conducive to goat and sheep production. Intensive feedlot management is not currently in place but is worthy of examination.

4.10 Small stock will occupy a central position in farming systems designed to accomodate smaller mixed-agriculture farming enterprises. Poultry and pig production, which lend themselves to large-scale concentrated processing, are likely to be dominated by one or two processors. A single organization produces more than 50% of projected poultry requirements for local consumption. Pig production is likely to follow along the same lines. What might be desirable in this approach is same system that will incorporate the production from smaller establishments. Brief discussions at BARC indicated that a whole range of technical issues must still be addressed in this area. Some research results relating to pasture trials, goat and sheep productivity in relation to breed, and linkages between crops and animals are on record.

4.11 Detailed assessment of a substantial number of issues concerning the whole livestock industry will be necessary for the second phase of the project preparation. In this regard, the consulting services of an animal specialist should be secured. Functional skills desired should be such as to provide for an assessment of small stock development, improved pasture production, livestock production and processing, veterinary services for an effective livestock health programme and the formulation of research projects destined for extension purposes.

Table 4.4 Number of Livestock in the Project Area

Islands	Cattle	Sheep	Goats	Pigs
Eleuthera	123	1692	1798	522
Andros	268	1233	421	437
New Providence	410	635	851	4807
Abaco	78	208	55	56
Grand Bahama	38	15	38	359
Sub-total	917	3783	3163	6181
Long Island	-	5982	3500	243
Cat Island	67	368	2291	111
Exuma	27	812	1679	258
Acklins Crooked Island Mayaguana + Rest of Bahamas	230	-	2611	735
Sub-total	333	7162	10081	1347
Total (All Islands)	1250	10945	13244	7528

Source: Agricultural Census 1978, Commonwealth of The Bahamas

B. Crop Yields

4.12 Reference has been made to the reliability and usefulness of data available from the Agricultural Census of 1978. Nevertheless, Table 4.5 below provides the average yield according to the Census, and a potential targeted yield which can be expected with the application use of currently available technology involving proper choice of varieties, source and level of fertilizing nutrients and cultivation methods. It is important that meaningful and fairly precise data on the level of technology and projected yields for each main farming system be developed in the project area. Such information is sufficiently important to warrant special sample surveys during Phase II of the mission. An important off-shoot of such an exercise is that a basis for prioritizing research endeavours dealing with fruit and vegetables can be developed.

Table 4.5 Average Yield of Selected Crops and their Potential with Improved Technology

Crop	Average Yield (1) Pounds per Acre	Potential Yield (2)
Banana	19.736	24.000
Orange	6.547	40.000
Grapefruit	21.396	30.000
Lime	10.798	35.000
Corn	1.034	4.000
Potato	8.319	15.000
Cassava	11.834	24.000
Tomato	12.400	40.000
Onion	7.943	16.000

Source (1): Summarized from FAO Report 1987 and Agriculture Census 1978.
(2): Mission Estimates

C. Markets and Marketing

4.13 Three different markets can be identified for Bahamian agriculture. The first is represented by the local population of about 242,000 and can be called the "local market"; the second includes about 3 million tourists which visit the islands every year; and the third is the external market, traditionally linked to the United States, but also with possibilities in Canada, the United Kingdom and Western Europe. All markets have ample possibilities for Bahamian agriculture and this project will seek to create the necessary conditions for the country to take advantage of them.

4.14 As mentioned before, most of the local market is concetrated in the cities of Nassau and Freeport, around which most of the tourism is also centred. Therefore, whoever caters to the tourism industry also caters to the local population, and a significant part of the food and agricultural produce consumed in those two cities is imported. This situation changes in the remaining islands, where local production has a much larger share of the markets; but then these markets are also small.

4.15 When looking at the marketing of Bahamian agriculture, a distinction must be made between livestock farmers and producers of fresh fruits and vegetables. Livestock farmers, primarily those in poultry meat, eggs and pork production, are all located in centres of their target markets and therefore have very simple distribution processes.

4.16 In the livestock production subsector, marketing has the following characteristics:

- The farmer plays the role of producer and wholesaler.
- The private sector is the only player in production and marketing.
- Government's marketing support services, with the exception of abbatoir and public health inspection, are not necessary.
- The distribution process is relatively efficient.

4.17 The marketing of fresh fruits and vegetables has a significant level of Government participation, primarily because it is now too complex and unprofitable to attract private sector interest. Its main aspects are the following:

- Government-owned and operated distribution facilities account for about 80% of domestic marketing of fresh fruits and vegetables.
- The Government plays a major role in setting the prices that farmers receive for fresh fruits and vegetables, mainly because it is the major buyer and wholesaler of those products.

4.18 The key players in the distribution of fresh fruits and vegetables are the following:

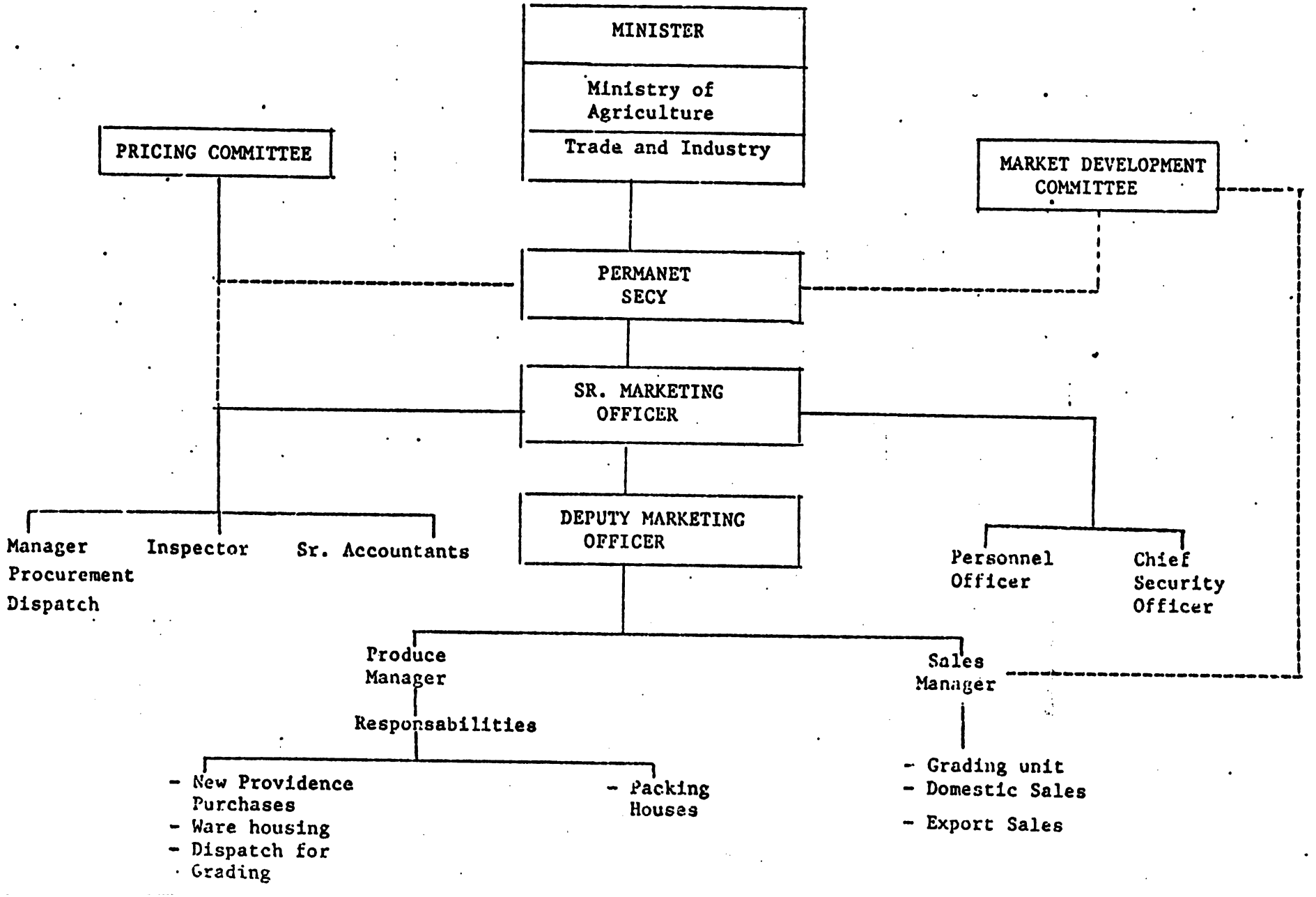
1) Ministry of Agriculture and its subsidiaries
   - The Produce Exchange
   - The Packing Houses
   - The Market Development Committee

2) Private Sector
   - Mail boats
   - Wholesalers and retailers

4.19 The Ministry of Agriculture coordinates the marketing of fresh fruits and vegetables. Day-to-day activities are coordinated by the Produce Exchange in Nassau, while field activities are executed through seven Packing Houses strategically located among the chain of leading producing islands: Eleuthera, Andros, Cat Island, Exuma and Long Island. Exhibit 4.1 which follows provides an overview of the marketing organization within the Ministry of Agriculture, Trade and Industry.

EXHIBIT 4.1

THE BAHAMAS: ORGANIZATIONAL STRUCTURE OF THE MARKETING DIVISION OF THE MINISTRY OF AGRICULTURE



4.20 In the private sector, there are two key players in marketing. They are a) the owners of mail boats, whose traditional responsibility has been to transport the mail, and b) retailers, such as supermarkets and grocery shops. The mail boat owners operate private boats and receive a subsidy from the Government to sail to specific islands. The supermarkets and other retailers distribute both imported and locally produced foods. Their main functions are the following:

- to carry adequate stock to meet their customers' needs, and
- to identify efficient sources of supply of goods.

Table 4.6 summarizes the role of each player in the distribution of Bahamian fresh fruits and vegetables.

TABLE 4.6 THE BAHAMAS: Key Players in The Marketing of Bahamian Fresh Fruits and Their Respective Roles

Operating Organization or Unit	Main Functions
1) Ministry of Agriculture, Trade and Industry	- Develop policy framework and sectoral programmes
	- Provide institutional support services
	- Monitor sectoral programmes
. Market Development Committee	- Review prices and develop markets for produce
. Produce Exchange	- Coordinate general movement of produce from the Family Islands, and supervise Packing Houses
. Packing Houses	- Warehousing and retailing - Grading and identifying markets - Grading, packing and shipping
2) Private Sector	
. Mail boats	- Provide shipping services for the Ministry of Agriculture of fresh produce from the Islands
. Wholesalers and retailers	- Distribute imported produce or fresh fruits and vegetables purchased from the Produce Exchange

4.21 The Produce Exchange, located at Potter's Cay in the Port of Nassau, has 11 cooling rooms and 43,500 sq. ft. of space. It has the following responsibilities:

. Coordination of the general movement of produce from the Family Islands.

- Grading of produce
- Central warehousing and wholesaling of agricultural produce
- Identification of markets
- Supervision of the work of the Packing Houses

4.22 The Packing Houses are provided with a compact-size building, grading equipment, weighing scales, packing tables, and a cooling room with capacity for about 10 tons.

Their specific duties comprise:

- Grading agricultural produce
- Purchasing marketable products
- Stocking and distributing packing material to farmers
- Supplying produce to the Produce Exchange and distributing some in local markets

4.23 The Produce Exchange, its outlets, and Packing Houses now employ 104 persons, distributed as follows:

. Produce Exchange	49
. Two outlets	13
. Packing houses	42

4.24 The Produce Exchange functions in a building with just over 43,000 sq. ft. of space, and is provided with grading equipment and a total cooling capacity for 180 tons. The building and equipment are, however, in very poor condition. The building needs major repairs and expansion or complete rebuilding in order to able to handle the growing through-put of produce. The cooling rooms need major repairs. There are 11 cooling rooms, but only 3 are working. The inadequate floor space and frequent breakdown of the cooling equipment have had a severe impact on the performance of the Exchange. The following illustrate this assertion:

- An estimated 50% of its purchases spoil and therefore cannot be resold.
- The high spoilage rate has caused severe cash flow pressure on the Exchange; consequently its suppliers have to wait long periods to be paid for their supplies.

Because of this, the project envisages the construction of a new Produce Exchange equipped to efficiently handle the increased production which is expected to result from the project.

4.25 The Packing Houses are small-sized buildings equipped with grading machines, packing tables, weighing scales and a cooling room with a capacity for approximately 10 tons of produce. Each Packing House also comes with storage space for packing supplies. During the peak season, the floor area, grading machine and cool storage are insufficient. Consequently, the farmer's produce sometimes waits as much as three days after harvest before they can be handled by the Packing House. This makes the time lapse between harvesting and delivery at the Produce Exchange in Nassau as long as 8 days. The inadequacies at the Packing Houses, especially in grading and storage, have the following impacts on the farming community, and on the viability of the packing operations:

- Farmers have to leave an estimated 30% of their crops in the field.
- Farmers lose 5% or more of their produce when it is delivered to the Packing House, due to quality deterioration after waiting for as long as three days to be graded and accepted.
- The Packing Houses lose a further 20% or more during peak season due to breadowns of the cooling equipment, and poor storage and handling.

4.26 The movement of the produce from the farm to the consumer has at least 15 stages. These are:

. Stage 1	The farmer reaps and packs.
. Stage 2	The produce is trucked from the farm to the Packing House by the farmer or private trucker.
. Stage 3	The produce is unpacked for grading and repacking.
. Stage 4	The produce is repacked and stored while awaiting shipping.
. Stage 5	The produce is transported by truck to the dock.
. Stage 6	The produce is off-loaded on to the dock and sometimes waits there, in the sun, for several hours before it is loaded on the boat to Nassau.
. Stage 7	The produce is loaded into a hot, poorly-ventilated boat: usually the mail boat. - Most boats operate without a working cooling room. -The produce is packed in the hold of the boat.

. Stage 8	The boat travels to the Produce Exchange in Nassau. The trip can last more than 6 hours.
. Stage 9	The produce is off loaded on the dock in Nassau, on the site of the Exchange.
. Stage 10	The produce in moved to the floor of the Exchange.
. Stage 11	Sometimes the Produce Exchange grades the produce again.
. Stage 12	The Produce Exchange stores the produce.
. Stage 13	The Produce Exchange sells and delivers the produce to the buyers at the counter.
. Stage 14	The produce is transported by truck to the buyer's distribution centre, less than 1- hour away.
. Stage 15	The distributor or retailer packages produce into household-size packages or transports it in the original packages to large institutional consumers.

4.27 This distribution process is too long and complex, and the Produce Exchange and the Packing Houses assume most of the risk involved.

- Responsibility in Stages 4 to 13 are borne by the Produce Exchange.
- Responsibility in Stages 5 and 7 should be borne by the trucker and shipping company, but in practice, they manage to shirk responsibility.
- The Produce Exchange is sometimes exposed to risk even at stage-14, since the buyer/wholesaler sometimes rejects the produce it arrives at his outlets.

4.28 It is costing the Produce Exchange $2.70 to earn each dollar of revenue. Over the period January 1983 to March 1986, it spent $11.9 million to earn only $4.4 million. Consequently, its accummulated loss for the period was $7.5 million. Table 4.7 illustrates this situation:

TABLE 4.7 THE BAHAMAS: Operating Results of The Produce Exchange 1983 - 1986

Year	Sales $000	Expenditure $000	Loss $000	Spoilage/Sales %
1983 (full year)	1,314	2,870	1,556	15.7
1984 (full year)	1,111	4,564	3,453	12.5
1985 (full year)	1,519	3,500	1,981	40.5
1986 (Jan - Mar)	467	1,005	538	n.a.
Total $000	4,411	11,939	7,528	

Source: Ministry of Agriculture Loan Proposal - Agricultural Support Services, May 30, 1988, Technical Annex E. Pages 4-5

4.29 The major causes of the operating losses at the Produce Exchange include:

- A high spoilage rate (it has been increasing since 1983, from 16% to over 50%).
- Excessive staffing.
- Weak financial administration.
- The lack of a modern business approach to purchasing, marketing and distributing fresh fruits and vegetables.
- The unnecessary risks taken by the Produce Exchange.

4.30 All the observations made in the previous paragraphs regarding the marketing of fresh fruits and vegetables in The Bahamas lead to the identification of marketing as the most serious bottleneck for agricultural development in the country. For this reason, marketing infrastucture and channels, as well as a marketing information system, are being suggested as the main sub-project components of the proposed project. Chapter V of this report addresses the main aspects to be taken into account in the redesigning of the marketing systems in The Bahamas.

D. Farm Size and Distribution

4.31 A whole range of issues related to farm size and distribution, land tenure and settelement, and farming systems in The Bahamas are covered by Annexes 8 (The Farming Systems of The Bahamas) and 9 (Land Tenure and

Settlement Issues) of this report. This section presents a summary of those annexes and raises some points for consideration in Phase II of project preparation.

4.32 The Agriculture Census of 1978 recorded 4246 individual farms occupying 89,611 acres of land in The Bahamas. In designing an appropriate programme to promote further development of agriculture, it is necessary to examine more closely the distribution of farm size, the location of farming in the islands and the intensity of land use.

4.33 Farming land is unevenly distributed among farmers in The Bahamas. To interpret the situation, Census data have been condensed into five farm-size categories. These categories are intended to represent the farming systems probably employed, and the portential for future development.

The categories selected are:

Less than 2 acres	Most likely to be a part-time farmer operating in the low Investment system.
2 - 5 acres	A one-man farming operation, non mechanized.
5 - 20	More than a one-man farming operation will need labour assistance at least for harvesting. Some opportunity for capital accumulation and investment.
20 - 200	Potentially a farming business with paid wage labour, and sufficient cash flow to enable investment in mechanized farming methods.
Greater than 200	Mostly large-scale professional farms all paid labour, mechanized and technically sophisticated.

4.34 Table 4.8, below, presents the number and area of farm holdings by size categories .

Table 4.8 Number and Area (acres) of Farm Holdings in The Bahamas by Farm Size Category

Farm Size Class	Unit	Farms <2ac	Farms 2-5ac	Farms 5-20	Farms 20-	Farms >200	Total Farms
Total Farms	NΩ	1806	1188	983	227	42	4246
	Area	1548	3563	8651	10091	55758	89611
Percentage	NΩ	42.5	28.0	23.2	5.3	1.0	100.00
	Area	1.7	4.0	9.7	11.3	73.3	100.00

4.35 The data demonstrate a marked skewness in farm-size distribution. About 43.0% of individual farms were less than 2 acres, and about 71.0% had less than 5 acres. Collectively they occupied not much more than 500 acres, or 5.7% of the recorded farm area in The Bahamas. At the other end of the scale there were 42 farms (1% of the total) larger than 200 acres, occupying 65,758 acres, or 73.4% of total farm area.

4.36 Farm land is not only unevenly distributed among farmers, but it is also unevenly distributed among islands. The general distribution among the islands is given in Annex 9 of this report. It shows that 85% of the better agricultural class land is on three islands of the Northern group: Andros, Abaco and Grand Bahama. Yet, 62% of the land used for agriculture is in the Southeast. However, this has been, the traditional pattern of Bahamian agriculture, and does not provide a basis to guide development of the agricultural sector.

4.37 Another feature of Bahamian agriculture which creates difficulties for development is the matter of land tenure. This is both in terms of the way in which the land is held by farmers for their current operations, and the matter of access to additional land for those who wish to become farmers or to increase their farming activities.

4.38 In The Bahamas there are four categories of land tenure, classified on the basis of occupancy and ownership status. These are:

Generation property:	Lands are essentially "family lands" which remain occupied by successive generations over time. These lands cannot be sold or transferred outside a family, although there could be some element of fragmentation with respect to occupancy.
Commonage Lands:	These lands are available for use by all individuals within a community, but are owned by no one. Community collective decision-making may be applied in ratifying or vetoing the use of these lands by other persons within a particular community.
Crown Lands:	These are lands owned by the government. It is estimated that there are about 2.0 million acres of these lands. Further, these lands provide the most promising land resource potential for agricultural development. About 400,000 acres of these lands are in natural forests, a situation which will require that the issue of land-use rationalization be addressed.
Private Property:	This is usually occupied on a freehold basis, with the owner having a registered title to the land.

4.39 The issues which will need clarification and which the mission feels that should be addressed during the preparation of the project are:

(i) what are adequate farm sizes for achieving satisfactory farm incomes;

(ii) who needs tractors and other equipment, depending on farm size or farm enterprise.

(iii) which crops should be grown, given the alternatives or mix of vegetables, tree fruits, livestock, pasture;

(iv) the extent of the possibilities for increased commercial agricultural production in the Northern Islands must be precisely established (on the basis of agronomic assessment, marketing possibilities and physical land-use surveys), and the necessary land requirements made available to investors on a programmed basis;

(v) in the Southeastern Islands, the focus will be on areas where land preparation represents a high capital cost, but there is scope for working with contiguous parcels. Areas having no unsurmountable physical or social constraints to a viable agriculture development programme will have to be given priority.

E. Prices

4.40 The Bahamas registered an annual average inflation rate of 5% during the period 1982-1987. The rate of inflation is comparable with those in industrialised countries, as illustrated in Table 4.8.

Table 4.8 The Bahamas: Comparative Rates of Inflation 1983 - 1987

Year	The Bahamas %	U.S.A. %	U.K. %
1983	4.1	3.3	4.6
1984	3.9	4.3	5.1
1985	4.6	3.5	6.1
1986	5.4	2.0	3.4
1987	5.8	3.6	4.2

Source: Central Bank Report, March 1988. Table 5.3

4.41 Food prices registered 7.5% average annual growth as a result of steep increases in the prices of imported foods, which account for 85% of the market. While food prices continue to rise at a rate 1.5 times the national inflation rate, the prices for the key domestic produced foods have declined by as much as 14%.

4.42 The key factors influencing the decline in domestic food prices are:

- The open market pricing policy instituted by government;
- Prices are determined weekly, on the basis of those prevailing in the U.S. market;
- Improper transportation and handling cause severe deterioration of the products, so that retailers and consumers perceive local produce to be of poor quality, relative to imports and, therefore, purchase local produce only when prices are lower; and
- The supply of local produce is not carefully managed. There are frequent periods or seasons of excess supplies, causing prices to fall.

F. The Labour Force, Employment and Availability of Agricultural Labour

4.43 The labour force survey reports that in May of 1986 the Bahamian labour force stood at about 110,000 persons. In relation to the previous survey, done in 1980, the average annual growth rate of the labour force was around 4.5%. During the same 1980-86 period, the Bahamian population increased at an estimated average annual rate of 1.7%, which suggests an increasingly high rate of labour participation. The labour participation ratio was estimated to be 71.4% in 1986, an increase of 4.0% over 1980.

4.44 The unemployed component also increased during this period, but at a much slower rate, resulting in a slight decline of unemployment from an estimated 13.0% in 1980 to 12.2% in 1986.

4.45 The work force is relatively young, with about 48% being less than 30 years of age. The age group 15-29 years accounts for about 44.0% of the employed work force, and by contrast, about 76% of the unemployed. The average unemployment rate, countrywide, is estimated at about 12%, but there is a wide variation among the islands. The estimated rate ranges from 8.3% in Abaco to 15.0% in Andros. The nationwide average unemployment rate for males is 9.7%, ranging from 6.6% in Abaco to 14% in Andros.

4.46 The category classified as "community, social and personal services", which includes the Government sector, represents the largest employer of labour in The Bahamas, accounting for approximately 31% of employed persons. This is followed by the group hotels and restaurants, with 20% and commerce (retail and wholesale trades) with 13%. Agricultural and related activities (e. g. forestry and fishing) accounted for only about 5.0% of total employment in 1986.

4.47 The distribution of employment varies widely among the islands, based on the main economic activity which takes place on a particular island. Among the Family Islands, agriculture has for a greater share of employment.

4.48 Migration from the Southeastern Islands to the Northern Islands, particularly to New Providence and Grand Bahama, continues to pose a serious problem as regards labour availability in some islands, on the one hand, and the social pressures created in the metropolitan centres (Nassau and Freeport), on the other.

4.49 The following table provides a breakdown of the farm population, or of the occupants of farmsteads, as provided by the Agricultural Census.

Table 4.10 Farm Holders by Age, Sex and Size of Holding

Farm Size Class	Unit	Farms 2ac	Farms 2-5ac	Farms 5-20 ac	Farms 20-200ac	Farms 200 ac	Total Farms	Percent All Holders
15-24 years		31	28	12	5	4	80	1.9
25-34		152	45	36	10	1	244	5.7
35-44		333	156	120	23	4	636	15.0
45-54		387	282	249	45	5	968	22.8
55-64		408	332	305	76	13	1134	26.7
65-74		334	251	209	48	9	851	20.0
75 years plus		161	94	52	20	6	333	7.8
Total Holders	Male	1101	833	826	200	32	2992	70.5
	Female	705	355	157	27	10	1254	29.5
	Total	1806	1188	983	227	42	4246	100.0

Source: Agricultural Census 1978 and FAO Reports

4.50 The data demonstrate that 54.5% of all farmers were 55 years or older in 1978, which underlines the extent of out-migration from agriculture. Although no more recent information is available on this issue, there is also no indication that this trend has changed appreciably.

4.51 The adequate supply of domestic labour on a timely basis to support an expansion in agricultural production is expected to pose a problem in The Bahamas. The hotel and service sectors, being dominant as they are, will continue to attract younger workers. This situation of labour supply will no doubt have implications for the country's policies on employment and migration in the near future. It will also appreciably influence the approach taken to stimulate development of agriculture, particularly with

respect to the selection of enterprises, their location and the level of capital intensity adopted. The issue of migration, however, transcends the labour supply problem, and encompasses such wider political and socio-economic considerations as decentralized regional development and income redistribution through appropriate wage and price policies which discriminate on the basis of location and type of industry.

G. Research and Extension Services

4.52 The development of agriculture in countries such as The Bahamas, with limited availability of land and water supply, must be based on the adoption of technologies that will maximize production. Scientific research is the source of such technologies, whether it is original or whether it adapts tecnology to the country's specific conditions.

4.53 Agricultural research in The Bahamas started in 1973, with an agreement between the Ministry of Agriculture and the United States Agency for International Development (USAID) that led to the establishment of the Bahamas Agricultural Research Centre, on Andros Island. The project was executed over a five year period. Research results which have been accumulated since that time should be used as a starting point for a new phase of research efforts in the country. This is a primary objective of the project and will be considered and analysed in detail during Phase II.

4.54 Extension services should be directed at crop production and marketing information. Technical aspects of crop production, such as reduction of post-harvest losses and quality assurance, should be transmitted to the farmer together with marketing intelligence and information, since both these aspects of extension are equally important.

4.55 As mentioned before, the main agricultural research institutions in The Bahamas are The Bahamas Agricultural Research Centre (BARC) on Andros Island and the Gladstone Road Agricultural Complex (GRAC) on New Providence Island. Both were visited by the mission and will play a major role in the proposed project. A complete evaluation of both institutions will be undertaken during Phase II of project preparation, together with the planning of their contribution to the execution of the project. Issues to be addressed include:

(i) establishing research and extension priorities and programmes in the areas of crops, soils, livestock and farming systems;

(ii) exploring sources of international cooperation and technical assistance to help expedite the reorganization of research and extension services; and

(iii) designing the renovation of BARC and GRAC as far as physical plant and equipment are concerned.

Chapter V THE PROJECT

A. Sub-Projects

5.01 The major project objectives specified in Chapter II will be achieved through the implementation of seven complementary sub-project components. The structure of these sub-project components is outlined as follows:

Marketing and Marketing Information Systems

5.02 These comprise two sub-projects for implementation purposes, but are presented together because of the close interlocking relationship between them.

5.03 The existing system through which domestic agricultural products are marketed in The Bahamas is very unsatisfactory and represents a major constraint to any effort to improve the productive capability of commercial agriculture. It is for this reason that an improved marketing system and marketing information network is considered to be critically important to achieving the primary objective of the project.

5.04 It will be necessary to develop a significantly improved marketing system and marketing information network, catering primarily to domestic agricultural products, but also providing the required linkages and appropriate arrangements to support exploitation of export market opportunities.

5.05 The marketing information component will be developed and implemented to provide full and complete interchange of information between the various points of transaction in the market place. In addition to the use of media facilities (electronic and print), the agricultural extension services will provide a major conduit for the flow of marketing information. It is also envisaged that the Government will play a central role in facilitating the flow of timely marketing information with an eye to could enhance increasing intervention in export markets.

5.06 The various components and activities comprising the marketing channel for produce entering the domestic market will have to be reorganized and upgraded. In Chapter IV, section C, the shortcomings of the present system are clearly described.

5.07 The major issues and implications regarding the development of improved facilities for the marketing of fresh fruits and vegetables therefore centre on the following areas:

- production and marketing strategies for both the Northern and Southeastern Islands;
- the institutional framework for improved marketing;

- the physical infrastructure and logistic support necessary for handling of produce in increased volumes; and

- the management arrangements for marketing.

5.08 The following tables review these issues, their implications and the specific project activities which need to be undertaken in order to effectively address the present shortcomings and lay a satisfactory basis for enhancing agricultural development.

TABLE 5.1 MARKETING: Issues, Implications and Required Activities Production Perspective

Production and Marketing Strategies

Issues	Implications	Required Sub-Project Activities
1. Production is not driven by market conditions	1. a) Farmers are missing opportunities to maximize their earnings from foreseen market advantages. b) Uninformed farmers are experiencing severe financial losses in unfavourable market segments for which they produce.	1. Develop a three-part strategic marketing approach, as follows: a) a domestic marketing plan b) an export marketing plan c) a market information system and networking process to provide two-way information between farmers and the organizations supporting them with linkages to the extension service.
2. Production strategies and farming systems are not promoted effectively according to land, labour, resource endowment, market orientation and physical and institutional support capacities on each island.	2.a) Small scale farming does not take place in areas where it is economical to provide the required range of support services. b) Medium and large scale farms sometimes produce the same products as their small-scale counterparts for the same domestic market segments.	2. Develop and execute a strategic production program with 4 key components. a) Small-scale production promotion programme for New Providence, Eleuthera and Grand Bahama. b) A large-scale export-oriented production promotion programme for other islands. c) A special investment promotion programme designed to encourage investments in small scale farming and export oriented agriculture. d) Make more effective use of the principle of guaranteed farm gate pricing, using spatial differentials if necessarry.

TABLE 5.2 MARKETING: Issues, Implications and Required Activities
Institutional Perspective

Issues	Implications	Required Project Activities
1.a) The private sector's role in marketing is limited to retail. The Ministry of Agriculture has no legal framework for financial administration and accountability of retailers	a) The major marketing risks are borne by the Produce Exchange	1. Development and execution of a marketing institutional strengthening programme as follows: a) It should have the scope to: . plan and manage marketing programmes, . carry out administrative functions pertaining to corporate stability and accountability. . Accomodate private sector participation where practicable.
b) The Produce Exchange does not have a strategic business approach for providing a cost-effective marketing service.	b) Good financial administration practices are ignored, and subsidies arise from inefficient management. c) The operations run at loss despite the fact that there are no subsidies to farmers.	b) Provide technical assistance and training to strengthen the institution. Develop strategic plans and assist in implementing them.

TABLE 5.3 MARKETING: Issues, Implications and Required Activities Infrastucture, Logistic Support and Management

Issues	Implications	Required Project Activities
1. The physical facilities at the Produce Exchange and Packing Houses are inadequate, and they also function poorly.	1.a) Over 50% of foods purchased cannot be resold because of spoilage.	1. Financing of a project to upgrade and expand the Produce Exchange and Packing Houses. Should include: . Supply of building and equip ment, . Technical training for staff.
-The buildings are inadequate for handling produce and for storage.	b) Financial losses are in excess of earnings.	
-Grading facilities are inadequate	c) About 30% of farmers produce is not harvested due to inadequate handling and storage at the Produce Exchange.	
-About 80% of the cooling equipment is out of order.		
2. The 15 stage system of moving produce from farmers to consumers is long and inefficient.	2. The quality of the food deteriorates with the risk being borne by the Produce Exchange.	2. Technical assistance support to improve management logistics.
3. The boats transporting produce have limited cooling facilities.	3. Over 15% of produce deteriorates in transit.	3. Provision of a line of credit to upgrade the cooling system for boats on designated routes.

Research and Extension Services

5.09 The focus of this sub-project component will be directed at strengthening agricultural research and extension capabilities within the Ministry of Agriculture to address the needs of the small-farmer segment as well as the large-scale commercial operations. Outdated production technologies require replacement by new technologies and adaptive scientific research represents the source of this new technology.

5.10 The transfer of research results readily to farmers and investors for adoption and use is essential if the social benefits of research investments are to be reaped. This will be achieved by developing improved mechanisms within an extension service system that is properly linked to a research service system.

5.11 The research and extension services sub-project component will seek to establish an environment which caters to and supports ongoing adaptive research. The mission was of the view that adequate basic research information relevant to Bahamian agriculture is available, but the existing system to handle such areas as assembly, field trials and dissemination of the information is in need of strengthening. The project will therefore seek to improve research facilities at the Gladstone Road Agricultural Complex and The Bahamas Agricultural Research Centre (BARC) to the extent necessary for supporting the respective level of research and extension required to enhance agricultural development on an ongoing basis.

5.12 Soils, crops, livestock and farming systems will represent central areas of importance for research attention. Of critical importance is the issue of crop rationalization and spatial zoning. Plant protection, food technology, water management and laboratory services will represent important allied components. The level of training and experience necessary to effect such a programme is lacking within the Ministry. Research scientists will be expected to have at least minimal training at the post-graduate level. The great majority of professional staff in the Ministry of Agriculture have training at the Bachelor's level and those with post graduate training are assigned principally to administrative duties. The mission took the preliminary view that the total professional staff of the Ministry is probably more than adequate in number. What appears to be lacking is organization, a need for specialized advanced training and staff deployment within the context of the interest of the project area as a whole. Research scientists capable of guiding an effective research effort and extension specialists who can ensure proper and sound linkages between both areas are not currently in place. Changes in organization and management will be necessary in order to improved services related to production, research and extension.

5.13 After a broad and detailed assessment of the Research and extension situtation in The Bahamas, it will be possible to determine the extent of the needs and associated costs for Research and Extension Services within the project, with a clear definition of priorities and strategies to be adopted by both services.

5.14 The mission identified the following obvious areas to be addressed during Phase II:

(i) Preparation of the format for a functional research and extension service having appropriate and organizational management systems. Included in this would be recommendations for staff development and a strategy for quickly addressing research and extension needs on a project-area basis.

(ii) Establishing research and extension priorities and programmes within the context of crops, soils, livestock and farming systems for both the Northern and Southeastern islands.

(iii) Explore sources of international cooperation and technical assistance for quickly putting in place the framework for a research and extension unit.

(iv) A detailed audit and assessment of physical plant and equipment at the two research centres (BARC and GRAC) relative to adequacy and state of repair. In addition, a study of deployment of staff and apportionment of services between the two centres as they relate to the Bahamian agriculture will have to be undertaken.

Land Preparation and Input Supply

5.15 This sub-project component will seek to address two important issues: (i) the extent and costs of land preparation in the two project sub-areas, and (ii) the role and function of the Fish and Farm Store in Nassau.

5.16 The issue of land preparation is crucial to the design and overall impact of the project. Although it is not viewed as a problem in the Northern Islands, it can become a matter of concern in the southeast because of its high costs. The second phase of project preparation will look closely at the extent of land preparation in the Southeastern Islands and its related costs.

5.17 The principal role of the Fish and Farm Store is envisaged to be that of warehousing adequate supplies of such critical inputs as planting materials, pesticides and fertilizers. The facility is primarily organized to provide services to small farmers and particularly those in the Family Islands. The extent to which the organization has been effective and also, the financial aspects of its operations will be assessed against the background of the need for reliable sources of input supplies to support expanded agricultural production as targeted by the project. The project design will seek to restructure the operating system for the Fish and Farm Store in order to improve its flexibility in responding to farmers' needs and also to forge a close operational linkage with the Packing Houses, to which farm produce is delivered. In those islands having a relatively large farming population, it is expected that over time the private sector will undertake distribution of farm input supplies. Ultimately, the Fish and Farm Store could either be privatised or permitted to operate autonomously as a public enterprise.

Road Improvement

5.18 Inadequate road facilities are considered to represent a major constraint to agricultural expansion in The Bahamas. This is particularly the case in the Family Islands. The road improvement sub-project component will relate primarily to tertiary and arterial roads which serve agricultural areas. Improvement will consist essentially of repairs (e.g. grading, drainage, resurfacing and sealing). In this regard it is estimated that there is the need to construct about 50 miles of new feeder roads, and also upgrade or repair about 100 miles of this type of road. A preliminary list of islands to be assisted includes South Andros, Long Island, Eleuthera, Exuma, Mayaguana, Acklins and Crooked Island. However, during the Project Preparation - Phase II the exact extent of such infrastructural needs will be determined and justified within the context of the project. The concentration of this component is expected to be in those areas with a clear potential for improving commercial agricultural production as opposed to that required for social needs.

Credit

5.19 The flow of credit resources to the agricultural sector has been very limited. Outstanding credit to commercial agriculture has not exceeded 2.0% of total credit to the production sector in any given year. The Bahamian Development Bank represents the most active single institution providing agricultural loans, but even in this case, such loans account only for about 4% of the total portfolio. It is also important to note that agricultural credit extended by the BhDB represents only about 12-15% of gross lending to agriculture by commercial banks.

5.20 The most important constraints to an adequate flow of credit to agriculture consist of the following:

(i) limited resources available to the BhDB;

(ii) unacceptable collateral securities, as required by lending institutions;

(iii) inadequate institutional support in the Family Islands to deal with such areas as project preparation, loan administration, etc.

5.21 The credit sub-project component will relate to all three areas. In the case of financial resources, the approach can be selective within agriculture and the relevant support services, that is, for specific crops, and catering especially to marketing support services, such as tranportation.

5.22 The issues of collateral securities (including problems of acceptable registered securities) and credit administration could be addressed within the framework of institutional strengthening. In the case of latter in

particular (credit administration) greater use can be made of the existing cooperative system as proposed in Chapter II above.

Training

5.23 The emphasis of the training component will be on institutional strengthening in the Ministry of Agriculture, especially in the Research and Extension Services, and also in those agencies the operation or role of which is critical to project objectives (e.g., the Bahamian Agricultural and Investment Coorporation (BAIC), the Bahamian Development Bank, the land and Surveys Department, marketing agencies and selected cooperatives). The training component will be widely defined and can include arrangements for in-service training as well as technical assistance in special areas, as required. Part of the training will be carried out by parallel technical cooperation programmes.

5.24 It is envisaged that successful implementation of the respective project components will serve to create an improved and desirable environment with the institutional, technical and commercial support facilities necessary to enhance expansion of the agricultural sector in The Bahamas.

B. Project Costs and Financing

5.25 Preliminary estimates of project costs have been put between US$15 million and US$19 million. These proforma estimates include the direct counterpart financial contributions of the Bahamian government. A breakdown for the respective sub-project components is as follows:

TABLE 5.4 Breakdown of Estimate Cost Components (US$)

Item	Cost (Millions of US dollars)
. Marketing Infrastructure and Marketing Information System	5.0 to 6.0
. Land preparation costs and input supply	2.3 to 3.4
. Renovation of The Bahamas Agricultural Research Centre (BARC) and of the Gladstone Road Agricultural Complex (GRAC)	1.6 to 2.0
. Extension Services	0.6 to 0.8
. Road Improvement and Construction	4.0 to 4.5
. Training	1.0 to 1.5
. Credit	0.5 to 0.8
Total	15.0 to 19.0

C. Project Benefits

5.26 The beneficial impact of the project is expected to be realized in three areas.

Direct Economic Benefits

5.27 The most immediate and momentary benefit resulting directly from the project relates to savings in public expenditures. Such savings will be a consequence of improvement in the efficiency of operations at the Produce Exchange and Packing Houses. At present, losses by the Produce Exchange alone amount to 63% of operating costs or about $2.5 million annually (see Chapter IV, Section C).

5.28 The reduction of postharvest losses which can be directly attributed to the existing poor marketing system represents another direct economic benefit. These losses are estimated to at about $12.0 - $14 million annually. The bulk of these losses, about 30%, occur in the field as a result of products not being delivered in a satisfactory state for transport to market.

5.29 By establishing an improved and more efficient marketing system, a positive supply response by producers is likely to result. Consequently, it is expected, ceterius paribus, that production and farm incomes will also improve over the medium term. For preparation of the project document, appropriate data will be assembled and analyzed to demonstrate the extent to which output and incomes are likely to increase and within what time frame.

5.30 Increases in net foreign exchange earnings represent another direct economic benefit which will result from the project. Increased foreign exchange earnings will result from the increased export of fruits and vegetables, while increased savings will be realized by way of import substitution of those products. At present, locally-produced food in The Bahamas accounts for only about 20% of total consumption. The extent of the net benefit in trade resulting from the project will be calculated when preparing the project document itself.

Indirect Economic Benefits

5.31 Stability in domestic food prices, which is likely to be realized as a result of increased production and improved marketing efficiencies, represents an important indirect economic benefit resulting from the project. This expectation also presumes improved levels of cost efficiency at the farm level; improved efficiency on farms along with a reliable marketing system should serve to appreciably increase profitability among commercial farmers and thereby create an environment for increased capital investment in Bahamian agriculture.

Social and Institutional Benefits

5.32 This category of benefits comprises:

(i) Institutional strengthening in the Ministry of Agriculture, the Bahamian Development Bank, BAIC and the cooperative movememt. The process of strengthening will take the form of more effective institutions an improved communications system, more competent extension and research facilities and improved training and credit administration systems.

(ii) Strengthening and improving the institutional mechanisms through which land tenure and settlements issues are dealt with.

(iii) Improving employment opportunities in farm areas and, through a general improvement in the rural environment, creating conditions to slow down rural-urban migration, particularly among the young.

5.33 The profile and levels of a preliminary estimate of benefits which will accrue to the project are presented in the following table:

TABLE 5.5 Profile and Levels of Benefits

Type of Benefit	Principal Beneficiaries	Annual Estimated ($million) Value
Direct Economic		
a) Public Expenditure Savings	The Revenue System-Taxpayers	2.5
b) Improved Marketing Systems and Infrastructure	Farmers and Marketing Middlemen	12.0
c) Increased Farm Output	Farmers and Consumers	To be developed
d) Increased Net Foreign Earnings	Bahamian Economy as a Whole	20.0
Indirect Economic		
a) Stability in Food Prices	Consumers/Economy as a Whole	—
b) Increased Profitability and Capital Investment in Agriculture	Rural Farm and Non-farm Sector	To be developed
Social Institutional		
a) Institutional Strengthening	Ministry of Agriculture, Marketing Agencies, Public Sector Organizations and Cooperatives	—
b) Land Settlement Administration	The Agricultural Community	—
c) Improved Rural Employment Opportunities	Rural Youths	—

D. Project Justification

5.34 The design of the proposed project will take the following into consideration:

- Size of domestic and external markets for increased output of the major crops to be produced;
- The implication of increased foreign exchange savings/earnings; and
- Socio-economic improvements in the Southeastern Islands.

Market Analysis

5.35 The net imported food bills for The Bahamas amounts to about US$120 million per year, and has been growing at an average annual rate of about 14.0% over the past five years. Further, it is estimated that about 33% of tourist related expenditures in The Bahamas is for food and this amounts to about US$300.0 million per year.

5.36 A major initial benefit of the project will therefore be in the increased foreign exchange savings resulting from decreased importation of certain food items (primarily fruits and vegetables). The potential for increasing exports, though promising, will be realized over the medium term dependent on larger-scale commercial operations in the north. A major output of the project will be improved integration with the tourist sector through the provision of domestic foodstuffs.

Socio- Economic Improvements in the South

5.37 From an economic perspective, the project as contemplated consists of two components. Agricultural development in the Northern Islands will be more responsive to market conditions and sustained on the basis of commercial viability. In the Southeastern Islands, however, there is a greater subsistence component which will have to be accomodated by the development programme. Therefore, there will inevitably be a higher degree of public sector subsidy which will take the form of infrastructural costs (e.g., land preparation and improvements to roads and other transport facilities). The main justification for this second component is to maintain the social integrity of communities in the Southeastern Islands and by so doing, provide a basis for pursuing a longer-term programme of diversified economic development. Such social integrity will be maintained through the creation of economic opportunities in the southeast, which are expected to stop and reverse the present trends for out-migration towards the north.

Chapter VI. PROJECT EXECUTION

A. The Borrower[1]

6.01 The Borrower and Guarantor will be the Commonwealth of The Bahamas through the Ministry of Finance. The Constitution of The Bahamas took effect on July 10, 1973 when The Bahamas was formally declared independent under The Bahamas Independence Order, 1973. As a former British Colony, the Commonwealth of The Bahamas has been influenced by British legal traditions and practice. The Bahamian courts apply common law principles and theory, although the vast majority of Bahamian law is statutory law enacted by the Bahamian Parliament.

Administrative Law and Procedure

6.02 Administrative law and procedure is well developed in The Bahamas. Although there are few autonomous regulatory bodies, the various ministries usually have broad statutory authority to carry out their respective mandates through the issuance of appropriate regulations. However, the Interpretation and General Clauses Act, 1976 requires that all rules, regulations and by-laws be laid before both Houses of Parliament within 14 days of their publication in the Gazette. The House of Parliament then has six weeks from the day such rules are laid before it to enact a resolution ordering the Governor General to issue an order revoking the rules, regulations or by-laws. Unless the applicable statute states the contrary, no further legislative action is required before regulations issued by a government agency can take effect.

Public Finances

6.03 Chapter IX of The Bahamas Constitution established a Consolidated Fund into which are paid all revenues accruing to the Government. The Minister of Finance is required to present to Parliament annual budget estimates together with the Appropriations Bill containing estimated aggregate sums to be expended. The sums contained in such bill represent maximum levels of public expenditures for the respective financial year. No public expenditure out of the Consolidated Fund, other than statutory expenditures, may be made unless it is authorized in the Appropriations Act. Statutory expenditures do not require further Parliamentary approval. Supplementary appropriations may be approved where necessary. Government counterpart funds needed for the proposed project will be contained in the annual Appropriations Bill and will be charged to the Ministry of Finance for the line of credit programme, as a capitalization of BhDB.

1\ Section A is adapted from the IDB document Project Report - Multisector Global Credit Programme (BH-0004) - Bahamas Development Bank - IDB, Washington, D. C., 1988

Legal Aspects of Relations Between The Bahamas and the IDB

6.04 With respect to the repayment of IDB loans, The Loans (Inter-American Development Bank) Act, Act No. 12 of 1977 authorizes the Government to borrow or guarantee the borrowing of such sums as may be required for the development of The Bahamas. The Act also authorizes the repayment of interest and principal on such loans to be made from the Consolidated Fund. Under the laws of The Bahamas, the Government must obtain from the House of Assembly a prior authorization to borrow before entering into a loan or guarantee agreement with a private or public lender. However, no legislative ratification of the contracts per se is required although the signed contract must be laid before the House within the thirty days of the conclusion of the agreement. This latter procedure is for informational purposes only and would not affect the date of validity of the contract.

B. The Executing Agency

6.05 During Phase I, it was too early for the mission to discuss with the Ministry of Agriculture the details of project execution. Nevertheless, the mission indicated to the Ministry that, given the nature of the project, a strong and agile Project Implementation Unit would have to be established in order to ensure timely and coordinated project execution.

6.06 Even though the subject has not yet been discussed in detail, it can be expected that the Executing Agency for the project will be the Ministry of Agriculture, Trade and Industry through a Project Implementation Unit which would be established within the Department of Agriculture and which would be ultimately responsible for all aspects of project execution. The Project Implementation Unit would be created specifically for the project and would be responsible for planning, supervising, controlling and administering the execution of the project. This unit must be established prior to the first disbursement in order for project execution to be initiated in a timely manner according to the implementation schedule and project execution plan to be proposed during Phase II of project preparation. An organizational structure of the Project Implementation Unit is suggested in Annex 6.

6.07 Another issue concerning project implementation to be discussed during Phase II will be the role that The Bahamas Agricultural and Industrial Corporation (BAIC) is likely to play in the execution of the project and/or in the promotion of activities that the project is expected to encourage and facilitate.

C. Implementation of the Project

6.08 During Phase II, as the design of the sub-projects is completed, the whole issue of project implementation will be dealt with in detail. At this stage, it will suffice to point out the main aspects of project

implementation to which attention should be paid during Phase II.

6.09 The following aspects are of importance:

(i) Timetable for the execution of the project. It is likely that the project will be executed over a period of 4 years from the date of signature of the loan contract.

(ii) Construction of physical facilities. Attention must be paid to the phases of bidding, actual construction, and provision of equipments and furnishings.

(iii) Credit resources and total project resources. Attention must be paid to the scheduling of commitments and disbursements of resources.

(iv) Project Implementation Unit

-legal status
-staffing and staff duties:

- Project director, responsible for the overall supervision, coordination and administration of the project;
- Planning and programming specialist, responsible for the preparation and maintenance of the Project Execution Plan (PEP) and Annual Plans required for project supervision, as well as the training and technical cooperation to be executed parallel to the project;
- Engineering and supervision, likely to be carried out by the Ministry of Works and perhaps by a consulting firm in the case of the new Produce Exchange;
- Monitoring specialists, responsible for keeping track of the execution of the various sub-projects and for coordination among the executing agencies; and
- Accountant and assistants responsible for recording the financial data of project accounts, certifying expenses, making disbursement requests, and submitting financial requests.

(v) Execution of the Credit Sub-project

Detailed description of how the sub-project will be executed and the likely role to the played by the Bahamian Development Bank (BhDB) in its implementation. Agreements between the BhDB and the Borrower. Constitution of a credit committee. Loan regulations and loan recovery.

D. Execution of Subprojects

6.10 The preliminary list of sub-projects include the following:

1. Marketing - infrastructure and channels
2. Marketing information system
3. Land preparation and input supply
4. Credit
5. Research and Extension
6. Road improvement
7. Training

The complete project document, to be prepared during Phase II, will describe the execution of each sub-project in detail, paying attention to the aspects of implementation strategy, inter-agency coordination, personnel/staffing, construction, work plans, equipment, etc.

E. Monitoring and Evaluation

6.11 Since this is the first sector-wide agricultural project in The Bahamas to cover 11 of the 14 major islands of the archipelago and since it will encompass several components requiring coordinated implementation, it is essential that the two separate activities of monitoring and evaluation be carried out as part of project execution. Monitoring and evaluation are two related but distinct functions.

6.12 Monitoring has been defined as "the continuous or periodic review and surveillance (overseeing) by management at every level of the hierarchy of the implementation of an activity to ensure that input deliveries, work schedules, targeted outputs and other required actions are proceeding according to plan."1\ Monitoring has to do with the day-to-day management of the project. It provides management with feedback information with which it assesses the progress of implementation so as to permit prompt action to be taken to correct whatever is not going according to plan. Monitoring is related to the delivery of project inputs and serves to verify if these inputs are having the initial effects which are expected of them. Monitoring will be an internal function of the Project Implementation Unit.

6.13 Evaluation, in turn, is "a process for determining systematically and objectively the relevance, efficiency, effectiveness and impact of activities in light of their objectives. It is an organizational process for improving activities still in progress and for aiding management in

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1\ See Monitoring and Evaluation - Guiding Principles, UN-ACC Task Force on Rural Development, IFAD Publications, Rome 1986, page 13.

future planning, programming and decision-making."2\ Evaluation is, therefore, an activity with a longer perspective. It assesses the overall effects of the project and their impact on the achievement of project objectives. Evaluation is generally conducted by an institution external to the execution of the project.

6.14 The mission believes that these two activities should be incorporated into the apparatus of project implementation, to ensure a more efficient and effective execution of all subprojects. Given the relative complexity of these functions, the design of the monitoring and evaluation systems of the project will be left for Phase II, when aspects such as which institution will be in charge of evaluation, baseline data, data to be collected during the implementation of the project, field questionnaires, etc., will be defined.

2\ Opus cit., page 14.

Chapter VII RECOMMENDATIONS AND TERMS OF REFERENCE FOR PHASE II

A. General Framework

7.01 The main objective of Phase II will be to complete the project's feasibility study, according to the format proposed in Annex 5 of this report. In order to accomplish such objectives, the mission will focus its work on the following tasks:

a. to complete the information on the project area on an island-per-island basis, so as to collect a sound data base for the design of the various sub-projects and of the two development strategies for the Northern and Southeastern Islands;

b. to complete preparation of the Chapter titled The Project, by refining the project concept, spelling out in detail the two agricultural development strategies for the Northern and Southeastern Islands, and designing each of the sub-projects, following or possibly modifying the preliminary list of sub-projects presented in Chapter V of this report;

c. to plan the activities and design the institutional arrangements for smooth and efficient project execution, spelling them out in a clear and coherent way in the chapter about the project execution; and

d. to carry out the technical, institutional, financial and economic analysis of the project according to the criteria adopted by the Inter-American Development Bank, so as to justify its financing and execution (Chapter on Justification.)

7.02 The mission will carry out all these tasks in close collaboration with the national counterpart team, forming with the latter a single technical team for the preparation of the project.

7.03 Besides performing the tasks specified in point 7.01 above, the mission will assist the Ministry of Agriculture and other participating institutions to get ready for the execution of the project, by helping them make all the necessary legal/administrative arrangements and reorganize their operational units before project implementation begins.

7.04 The mission will take place in early 1989 and will have a total duration of three months, with several of its tasks being completed in a shorter time. It will be led by a Project Coordinator, and will include seven external consultants in the following areas of expertise: economics, agronomy, irrigation and drainage, agricultural marketing, road engineering, animal husbandry and financial and institutional analysis. This team will be matched by a national counterpart team of at least one professional for each area of expertise. The final composition of the national counterpart team will respond to the requirements and demands of the work and will be agreed upon by the Project Coordinator and the Ministry of Agriculture.

7.05 A reputable local civil engineering firm will be hired to undertake the design and planning of all civil construction required by the project, and will present its work according to the specifications of the IDB.

B. Terms of Reference for the Project Coordinator and the Consultants

7.06 The members of the Preparation Mission - Phase II will be highly qualified professionals with post-graduate degrees (Master's or Doctorate) in their own areas of expertise and/or considerable experience in project preparation for international financial institutions. The mission will be headed by a Project Coordinator and its other seven members will be external consultants hired specifically for the preparation of this project.

7.07 The Project Coordinator will lead the Preparation Mission - Phase II and will be ultimately responsible for the completion of the feasibility study. He will conduct his duties in close consultation with the National Coordinator and the Bahamian authorities in order for the preparation work to be accomplished in a smooth and efficient way. More specifically, the Project Coordinator will:

a. be responsible for the overall organization of the mission, taking care that technical and administrative support are adequately provided so as to ensure that the mission's work is accomplished in an efficient and timely way;

b. provide the technical team with the necessary instructions for completion of the feasibility study;

c. supervise the work carried out by the technical team;

d. in coordination with the National Coordinator, organize all the meetings considered necessary for completion of the work;

e. present the progress reports on the work of the mission considered necessary by the Ministry of Agriculture and/or the Bank; and

f. make sure that the feasibility study is prepared according to the terms of reference and the instructions agreed upon with the IDB.

<u>Economist</u>

7.08 The work of the economist will focus on all economic issues which must be addressed during Phase II for the completion of the feasibility study. He will carry out his work in close collaboration with the Project Coordinator and the technical team. In particular, he will:

a. together with the agronomist, assess the costs of production of the main activities proposed by the project;

b. help the Project Coordinator put together the final version of the project's feasibility study;

c. address the economic matters which must be covered in the various chapters of the feasibility study;

d. together with the other members of the technical team, prepare the various sub-projects which comprise the project; and

e. together with the Project Coordinator and financial analyst, undertake the financial economic analysis of the project.

Agronomist

7.09 The agronomist will be responsible for assessing the rationale and viability of the agricultural activities proposed in the project, with special reference to the development strategies designed for the Northern and Southeastern Islands, respectively. Moreover, he will analyse and make proposals to strengthen the institutional capability of the Ministry of Agriculture in the areas of agricultural research and extension. More specifically, he will:

a. examine the overall viability of the project's production activities as they relate to the Northern and Southern Islands;

b. formulate, with other members of the technical team, a number of farm models to represent the production proposals made by the project;

c. help reorganize the agricultural research and extension services of the Ministry of Agriculture according to the needs and requirements of project implementation, identifying priorities and strategies for both services;

d. contribute to drafting the section of the feasibility study assigned to him by the Project Coordinator; and

e. conduct all his work in close collaboration with the project's technical team.

Marketing Specialist

7.10 The marketing specialist will be responsible for the design of the marketing sub-projects, especially the marketing infrastructure and channels and the marketing information system, taking into consideration the main aspects of the Bahamian economy and the geographical characteristics of the country. In particular, he will:

a. assess the needs for marketing infrastructure in the participating islands and the capacity of the new Produce Exchange at Potter's Cay in Nassau;

b. together with the agronomist, the economist and other members of the technical team, carry out a marketing study for the products to be produced in the context of the project;

c. design the respective marketing strategies and systems for the Northern and the Southeastern Islands;

d. design a marketing information system to be put in operation at the beginning of project implementation;

e. discuss with officials of the Ministry of Agriculture the adequacy of the present institutional organization for agricultural marketing and, possibly, the need for strengthening it;

f. contribute to drafting those sections of the feasibility study assigned to him by the Project Coordinator; and

g. undertake the tasks under his responsibility in close collaboration with the Project Coordinator and the technical team.

Irrigation and Drainage Specialist

7.11 The irrigation and drainage specialist will work in close consultation with the mission agronomist and will assess the irrigation and drainage issues of the project area in order to provide a sound technical base for the design of production plans. More specifically, the specialist will:

a. Taking into consideration the peculiar conditions of The Bahamas, study the irrigation possibilities and drainage conditions of the eleven islands which form the project area, providing an estimate of how much irrigation can be introduced and how drainage problems can be solved;

b. assess the potential salinization problems which may occurr in the project area in the case of overly rapid extraction of water for irrigation;

c. appraise the possibilities for intensive commercial agriculture on the Northern Islands, with special reference to the more land-abundant Andros Island; and

d. work in close consultation with the mission agronomist, the Project Coordinator and the counterpart team to accomplish his tasks.

Road Engineer

7.12 The road engineer will be responsible for assessing the road improvement and road construction needs throughout the project area in order to facilitate agricultural production. More specifically, he will:

a. work in close consultation with the Mission Coordinator and the technical team in the conduction of his work;

b. together with the agronomist and the economist, appraise the need for road improvement and/or road construction in each of the eleven islands of the project area, specifying the type of roads to be constructed in each case;

c. provide an estimate of maintenance procedures and costs for the main types of roads in the project area; and

d. present his work in such a way that it conforms itself to the preliminary standards of design, in terms of maps, scales, design and detail.

Livestock/Animal Husbandry Specialist

7.13 The livestock/animal husbandry specialist will work in close consultation with the mission agronomist and will assess the possibilities for livestock raising in the project area. More specifically, he will;

a. taking into consideration the peculiar conditions of The Bahamas, study the possibilities for livestock raising in two project sub-areas, in order to provide a sound technical base for the design of production plans;

b. together with the agronomist, define priorities and strategies for the research and extension services in the livestock/animal husbandry areas;

c. collaborate with the agronomist and the economist in the preparation of farm models for the two project areas, advising on the kind of livestock that can be successfully raised and the scale that such enterprise can have on each of the participating islands;

d. within his area of expertise, contribute to the writing of the final project report as concerns the subjects and sections assigned to him by the Project Coordinator;

e. conduct all his work in close consultation and collaboration with the Project Coordinator and the technical team.

Institutional and Financial Analyst

7.14 The institutional and financial analyst will be responsible for the overall institutional and financial analysis of the institutions participating in project implementation. He will work in close consultation with the Project Coordinator, the mission economist, and the counterpart technical team in the fulfillment for his duties. More specifically, he will:

a. carry out an institutional budgetary and financial analysis of the Executing Agency and of other agencies participating in project implementation;

b. in close consultation with the Project Coordinator and the technical team, be responsible for the design of institutional organization and mechanisms for project execution;

c. together with the economist, prepare the credit sub-project; and

d. within his area of expertise, contribute to the writing of the final project report as concerns the subjects and sections assigned to him by the Project Coordinator.

C. Institutional and Technical Support in The Bahamas during Phase II

7.15 The preparation of a project like the present one requires a good deal of administrative and technical support from participating institutions, especially from the one mainly responsible for the project, the Ministry of Agriculture, Trade and Industry. Most of the pressure and demands falling on the technical team and on the institution in charge of preparating the project arise from the relatively short period of time within which all the multifarious tasks must be accomplished. Tasks must be performed and proposal must be made, not only on a sound technical basis but also in a timely manner, in order for a complete feasibility study to emerge at the end of the preparation period.

7.16 In the case of The Bahamas, these considerations are especially important for two main reasons. Firstly, because of its concept, scope and coverage, this is the first sector-wide agricultural development project to be prepared in The Bahamas, and its implementation will require a substantial amount of reorganization and redeployment of the Ministry's resources and capabilities. The Government of The Bahamas considers that the country's agriculture is at a crossroads; this project could be instrumental in redirecting it toward a completely new era. Secondly, the country's geographical configuration poses natural obstacles to the logistics of the preparation work.

7.17 Moreover, it can never be overly emphasized that, although a team of external consultants may play an important role during the preparation effort, a project like the present one is, above all, a Bahamian endeavour. That is, it must not only reflect the Government's policies, objectives and commitments towards Bahamian agriculture, but also must be fully understood and internalized by the executing institutions, so that it can have a fair chance of success. The preparation of a technically and economically sound feasibility study is just part - and a small part at that - of a whole project cycle. The crucial part is the organization for implementation and the implementation of the project itself.

7.18 The institutional and technical support that the Ministry of Agriculture is expected to provide during Phase II of project preparation is spelled out in Annex 3 of this report. Its main elements are:

a. The establishment of a technical team within the Ministry to serve the counterpart team to the group of external consultants; the composition of such team will be discussed and agreed upon with the Project Coordinator;

b. the Ministry's team will be led by a National Coordinator, who will work in close consultation and collaboration with the Project Coordinator;

c. the Ministry will provide all necessary information and data, and will facilitate the organization of meetings and internal travelling considered necessary for the preparation of the project; air travel expenses of the external consultants will be met by external funds; and

d. the Ministry will provide the project's technical team, consisting of the local specialists and the external consultants, with the necessary administrative support, such as secretarial services, office space and equipment, document reproduction and other miscellaneous services.

D. Recommendations for Technical Cooperation

7.19 The executing agency with final responsibility for implementation of the project will be the Ministry of Agriculture. The Ministry will, however, have to make several administrative and operational arrangements besides establishing a Project Implementation Unit, as the mission felt that the present administrative structure is not fully capable of assuming the level of responsibility a project of this magnitude requires.

7.20 The Ministry will have to substantially upgrade its administrative capabilities, particularly with regard to supervision and monitoring. These areas of weakness seem to already have been recognized, since a part of the present responsibilities of the Ministry is being conducted from the office of The Bahamas Agricultural and Industrial Corporation (BAIC). The BAIC is a statutory corporation falling under the Ministry of Agriculture, Trade and Industry. Being outside the civil service establishment, the BAIC seems to provide the flexibility required for the prompt and expeditious implementation of decisions. It will therefore be necessary for the Ministry of Agriculture to clearly define BAIC's role in project implementation, as well as to establish a project management unit and a project monitoring committee as necessary prerequesites to the launching of the project itself.

7.21 The extent to which subsidiary project components are effectively implemented will depend on the capabilities of these organizations which are directly responsible for such components. Institutional strengthening will be required in such areas as marketing cooperatives, the Land and Surveys Department, Agricultural Research and Extension Services, agricultural economic analysis, marketing information systems and the agricultural credit arm of the development bank.

7.22 All these areas are good targets for technical cooperation. This project presents a good opportunity for institutional strengthening, and such opportunity should not be wasted. A technical cooperation program

could be integrated into the project or, if it is considered more appropriate, one could be pursued outside the project but parallel to its execution.

7.23 In the case of the cooperatives in particular, the most promising opportunity concerns the development of a structure to provide agricultural credit in the islands. Once their operations have been upgraded through technical assistance, the cooperatives on North Andros, Cat Island, Mayaguana and Long Island could effectively function as secondary outlets for credit provided by the development bank. These institutions could also serve as financial intermediaries and savings mobilizers in those islands where no banking facilities exist at present, as in Mayaguana. It might be desirable to upgrade the capabilities of the cooperatives on a phased-basis over time, beginning with a pilot phase involving one or two institutions.

ANNEX 1

SCHEDULE OF REPORT WRITING ACTIVITIES DURING PHASE II FOR THE COMPLETION OF THE FEASIBILITY STUDY

ACTIVITIES	MONTHS		
	1	2	3
Chapter 1. Summary of the Project			———
Chapter 2. Frame of Reference	———		
Chapter 3. The Project Area	———		
Chapter 4. The Project			
4.1 Preparation of Subprojects	———	———	———
4.2 Costs and Financing		———	———
Chapter 5. Project Execution			
5.1 Organization for Execution		———	———
5.2 Other Aspects of Execution		———	———
Chapter 6. Justification			
6.1 Technical Justification		———	———
6.2 Institutional and Financial Justification		———	———
6.3 Socioeconomic Justification		———	———
6.4 Financial and Economic Analysis		———	———

ANNEX 2

SCHEDULING OF CONSULTANTS' WORK DURING PHASE II

SPECIALISTS	Months 1	2	3	No. of Months IICA UPP	Intern. Experts	Local Experts	TOTAL
1. Project Coordinator - IICA				3			3
2. Economist					2		2
3. Agronomist					3		3
4. Irrigation & Drainage Specialist					2		2
5. Marketing Specialist					2		2
6. Road Engineer					2		2
7. Livestock/Animal Husbandry Specialist					1.5		1.5
8. Civil Engineering (Firm)						3*	3*
9. Institutional & Financial Analyst					1.5		1.5
* The Civil Engineering Firm will allocate as many man/months as it deems necessary for the accomplishment of its tasks.							
TOTAL				3	14	3	20

ORGANIZATION FOR THE PREPARATION OF THE FEASIBILITY STUDY - (PHASE II)

1. Phase II of project preparation will consist of the completion of the feasibility study of the project. This task will be carried out by a technical team comprised of external consultants and a group of technicians put together by the Ministry of Agriculture specifically for this task.

2. The team of external consultants will be led by a Project Coordinator, who will also be responsible for the overall coordination of the project preparation effort. The technical team from the Ministry of Agriculture will also have a Coordinator. Both groups of technicians will work together in close consultation and collaboration with each other farming one single technical for the smooth and successful completion of the work assigned to them.

3. The Project Coordinator and the National Coordinator will work in close consultation with each other, so that the various activities and tasks of Phase II may be carried out in a coordinated and efficient way. The Project Coordinator will be the person ultimately responsible for the preparation of the feasibility study, according to the terms of reference agreed upon by the Government of The Bahamas and the IDB.

4. The Project Coordinator will have the following responsibilities:

   a. Provide the technical team with the necessary instructions so that the work may be performed in an efficient and effective way;

   b. Supervise the work carried out by the technical team;

   c. In coordination with the National Coordinator, convene all the meetings considered necessary for the completion of the work;

   d. Present the progress reports on the work of the mission deemed necessary by the Ministry of Agriculture and/or the Bank;

   e. Make sure the feasibility study is prepared according to the terms of reference, and finished on time;

   f. Inform the technical team about the recommendations made by the Bank's Mid-term Mission, and incorporate them into the project work when appropriate;

   g. Work in close consultation and collaboration with the National Coordinator.

5. The time allotted for the preparation of the feasibility study will be three (3) months.

6. There will be eight (8) expatriate professionals, including the Project Coordinator, who, together, will provide 17 man/months of work to the project, according to the following schedule:

	Man/months
- Project Coordinator	3
- Economist	2
- Agronomist	3
- Irrigation and Drainage Specialist	2
- Marketing Specialist	2
- Road Engineer	2
- Animal Husbandry/Livestock Specialist	1.5
- Institutional and Financial Analyst	1.5
Total	17.0

7. The work of the external consultants will be carried out according to the schedule presented in Annex 2.

8. The budget for Phase II of project preparation is presented in Annex 4.

9. The format of the feasibility study will be the one adopted and recommended by the IDB, and presented in Annex 5.

10. The terms of reference for the external consultants are the ones presented in Chapter VI, Section B of this report.

11. The Ministry of Agriculture will provide technical and administrative support to the preparation of the feasibility study along the following lines:

a. A technical counterpart team, comprised of personnel from the Ministry of Agriculture, and if necessary, from other institutions, will be put together to work with the group of external consultants during the preparation of the project;

b. the technical counterpart team will be led by a National Coordinator; its composition will be defined by common agreement between the Project Coordinator and the Ministry of Agriculture, and it must have at least as many members as the group of external consultants, and will be available for the three months of the preparation of the project;

c. the National Coordinator will work in close consultation and collaboration with the Project Coordinator, and will have the necessary qualifications, experience and authority be able to supervise the work to be done by the National Technical Team in their support to the preparation of the project;

d. a reputable local civil engineering firm will be retained to undertake the design and planning of civil construction required by the project;

e. all the activities, information, meetings and internal travelling and transportation necessary for the preparation of the project will be the responsibility of the Ministry of Agriculture; the air travel expenses of the external consultants will be met by external funds;

f. the Ministry of Agriculture will provide the technical team with the necessary administrative support, in terms of secretarial support, office space and equipment, copying services and other miscellaneous services.

A N N E X 4

THE BAHAMAS

BUDGET FOR THE PROJECT PREPARATION MISSION-PHASE II

			US $
1.	Consultants'Fees		
	14 man/months or 420 days x $180		75,600
2.	International Air Travel		
	Average Ticket Cost: $900		
	14 Tickets x $900		12,600
3.	Per Diems		
	485 days x $198		96,030
4.	Air Travel in the Bahamas		
	Regular domestic flights and chartered aircraft		4,000
5.	General Support		
	-Materials, reproduction of documents	2,000	
	-Secretarial Services	9,000	
	-Communications	2,000	13,000
	SUB-TOTAL		201,230
6.	General Expenses		
	(15% over Sub-Total)		30,184
7.	Contingencies		18,586
	T O T A L		250,000

ANNEX 5

FORMAT OF THE PROJECT'S FEASIBILITY STUDY

1. This Annex presents a proposal for the format that the feasibility study for the Agricultural Services Development Project is to have. Although it follows, in general lines, the format adopted by the Inter-American Development Bank, it is not intended to be a rigid design for a project document. On the contrary, it is presented with the underlying assumption that the format of a document should adapt itself to the contents of that document and how it should be presented. The format of the final document for the Agricultural Services Development Project will be agreed upon with the Mid-Term Mission that the IDB will be sending to the Bahamas halfway of project preparation.

2. The project's feasibility study will follow approximately the following format:

Chapter I. INTRODUCTION

- A. Background
- B. Previous IDB Projects and Support Activities for the Agricultural Sector in the Bahamas
- C. Other Agencies' Support to Agricultural Development

Chapter II. FRAME OF REFERENCE

- A. Overview
- B. Recent Economic Performance and Outlook
- C. Role of Agriculture in the Economy
- D. The Project Area
- E. Institutional and Social Issues

Chapter III. THE PROJECT

- A. Project Concept and Objectives
- B. Description of the Project
- C. Description of the Subprojects
- D. Cost and Financing

Chapter IV. PROJECT EXECUTION

A. The Borrower
B. The Executing Agency
C. Timetable for the Execution of the Project
D. Implementation of the Project
E. Execution of Sub-Projects
F. Final Plans and Designs
G. Procurement Procedures
H. Investment Schedule
I. Project Execution Plan
J. Operation and Maintenance
K. Monitoring and Evaluation
L. External Auditing
M. Inspection and Supervision of the Project

Chapter V. INSTITUIONAL ANALYSIS AND BUDGET

A. Institutional Analysis
B. Budget Analysis
C. Financial Analysis of the Credit Sub-Project

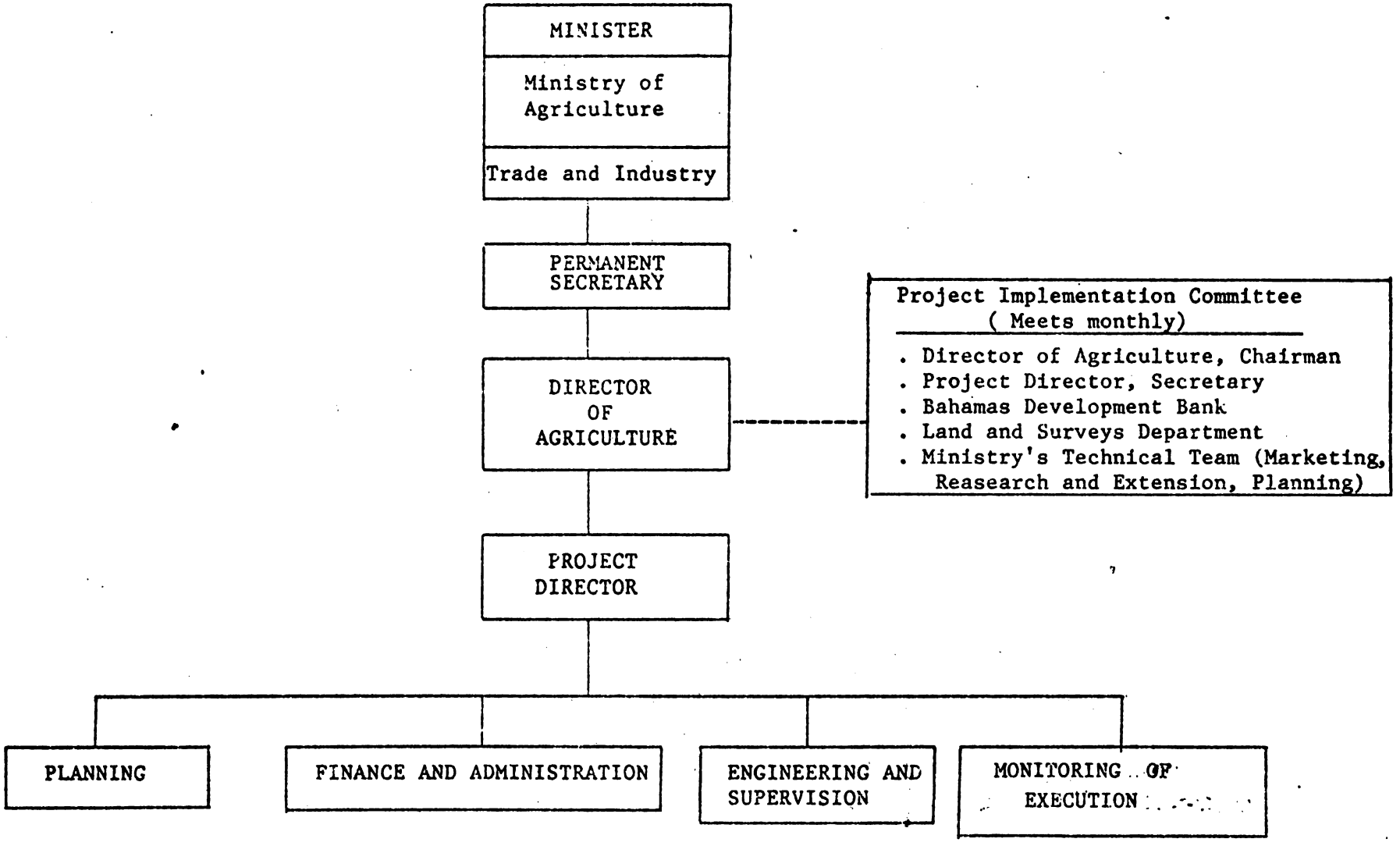
Chapter VI. JUSTIFICATION

A. Technical Justification
B. Institutional and Financial Justification
C. Socio-Economic Justification
D. Farm-Level Impact of the Project
E. Economic Impact of the Project
F. Internal Rate of Return
G. Beneficiaries of the Project

3. This format precedes a much more complete document on project preparation to be titled Guidelines for the Preparation of the FEasibility Study, that the Project Coordinator will prepare previously to the beginning of the second phase of the preparation of the project. Such document will specify in detail what is required by each section of each chapter of the feasibility study, and will be explained and discussed with the project's Technical Team before the preparation effort starts.

AGRICULTURAL SERVICES DEVELOPMENT PROJECT

PROJECT IMPLEMENTATION UNIT



PHYSIOGRAPHIC REGIONS OF THE BAHAMAS 1\

There are 17 islands or groups of islands in The Bahamas which can be deemed to have some measurable agricultural output. For agricultural assessment, there are significant differences between islands in terms of rainfall, vegetation, soil, surface deposits, presence of ground water and capabilities for ground water replenishment. The discussion which follows is based on Little et. al. (1977).

The most obvious distinction between the islands is in vegetation, leading to the division between the Pine Islands and the Coppice Islands. The Pine Islands are the four larger northern and central islands: Grand Bahama, Andros, New Providence and the Abacos. These have natural forests of Caribbean pine, and, generally a wetter, cooler climate. The pine forests occupy the soily rock plains, which are rough slightly elevated, ground and minor rigdes where the density of the forest and size of the timber is a useful indicator of the agricultural potential of the underlying land.

The remaining islands, which are in the southeastern Bahamas, were originally covered with hardwood forests and shrubland. Continuous occupation and exploitation over several hundred years have reduced this to closely spaced stands of narrow-stemmed, semi-deciduous and evergreen broad-leaved trees, often only 10 to 15 feet (3-4.5 metres) high, and rarely exceeding 35 feet (10 metres). The density and size of this woodland vary according to the quantity and seasonality of the rainfall, so that in the southeast it is reduced to sparse cover more closely resembling thorn woodland or desert scrub than the more abundant cover of the wetter central islands.

The classification of the islands can, therefore, be summarised as:

Pine Islands:	Rainfall - 40 to 60 in, Grand Bahama, the Abacos, Andros and New Providence
Coppice Islands:	Rainfall - 40 inches, Eleuthera, Cat Island, San Salvador
	Rainfall - 30 to 40 in, Long Island, the Exumas, Crooked Island, North and Central Acklins, Mayaguana
	Rainfall - 30 inches, South Acklins Inagua.

1\ This section is based on Little et. al. (1977) Land Resources of The Bahamas, Land Resources Division, Ministry of Overseas Development, U. K., and FAO Report.

Rainfall

In the Northern Islands the rainfall pattern is characterized by high annual falls which are unevenly distributed between a warm, wet summer season from May to October and a dry, cooler winter from November to April. Reliable long-term rainfall records are limited, and data used are from the 20 year summary (1951-1970) prepared by the Meteorological Office.

The preceding is set out in Table 1, below, for a series of selected locations throughout the Islands, and arranged in a north-south sequence. All the data are for a consistent period (1951-1970), except that for BARC (North Andros). There were no long-term data available for North Andros; however, considering its agricultural significance, the data for BARC were used despite the discontinuity of that data and the other information.

In assessing the agricultural potential of the various islands, the key parameters are the total rainfall, the distribution of the rainfall and the effective rainfall. The four northernmost islands all have between 50" and 60" of rain per year. In contrast, the four southernmost islands are the driest, with 45-55% of that amount, or 27.5" to 35.7" per year.

The absolute rainfall is not as important as is the reliability, so that farmers can plan their production and investment with some certainty. The reliability of the rainfall can be demonstrated by data prepared by Little et. al. (1977) on the expectation of a given amount of rain. (See Table 2).

The next important parameter is distribution. On a year-round basis, all islands share the same pattern, with a drier period of six months from November to April and a wetter period from May to October. The distributions vary from as little as 20% of total rain in New Providence in this period, to 35% to 40% in Mayaguana and Great Inagua. As a consequence of this variable distribution, the most favoured islands for winter rainfall are Abaco, Grand Bahama and North Andros, with 14.5" to 18" in this milder period, while all other islands fall in the range of 9.5" to 13.5". By contrast, of course, are the much larger amounts of rain in the summer, which, coupled with high temperatures, make growing conditions more difficult, especially for temperate crops.

The other aspect of distribution which is important is the way in which the rain falls. Most of the summer rain in The Bahamas falls in intense local storms which can produce wide variations in incident rain at close locations and which create local problems for producers.

TABLE 1 Summary of Mean Annual Rainfall (inches) at selected locations in The Bahamas, All stations 1951 - 1970 except BARC, 1974 - 1983

Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Green Turtle Cay Abaco												
3.00	3.27	3.21	2.93	6.00	8.94	5.44	5.25	8.91	8.41	3.24	2.30	60.90
West End Grand Bahama												
2.18	3.31	3.22	2.48	4.01	8.07	5.60	6.40	7.46	6.93	1.76	1.87	53.29
Bahamas Agricultural Research Centre Andros												
2.74	2.79	1.35	1.90	6.29	8.40	4.96	6.68	7.21	8.24	3.79	1.76	56.10
Nassau New Providence												
1.90	1.57	1.38	1.89	4.83	9.23	6.08	6.30	7.52	8.31	2.29	1.52	52.82
Harbour Island Eleuthera												
1.83	1.62	1.74	1.28	4.10	6.91	3.38	4.83	6.29	8.51	2.46	1.95	44.90
Rock Sound Eleuthera												
2.40	1.81	1.39	1.30	4.35	6.32	3.07	5.43	5.46	9.29	3.10	1.97	44.89
GeorgeTown Exuma												
1.81	1.01	0.74	1.22	4.97	7.17	3.16	4.05	4.47	6.63	2.33	2.22	39.78
Clarence Town Long Island												
1.86	1.01	0.97	1.31	4.06	5.21	2.29	2.67	3.85	7.16	3.30	1.96	35.65
Long Cay Crooked Island												
1.28	0.71	0.96	2.06	4.05	4.90	2.87	3.42	4.42	5.92	2.75	1.34	34.67
Abraham's Bay Mayaguana												
1.60	1.86	1.32	1.93	3.04	3.49	1.85	2.53	4.15	5.42	4.48	2.33	34.00

Source: Meterological Office Nassau and BARC Andros

TABLE 2 Mean and Expected Rainfall for Selected Northern and Southeastern Islands in the Project Area

No	Island	Mean Annual Rainfall Inches	Minimum Annual Rainfall expected 8 yrs out of 10	Estimated % probability of receiving less than 40 in.	30 in.
1	Eleuthera	45.0	37	12.0	3.0
4	Abaco	62.1	51	4.3	0.62
5	Grand Bahama	50.8	42	16.0	3.0
				30 in.	20 in.
6	Long Island	35.7	28	26	3.0
7	Cat Island	40.0	33	13	1.2
8	Exuma	37.7	31	19	2.0
11	Mayaguana	34.0	25	35	9.0

Source: Little et. al., Table 1., page 10.

There is the difficulty of maintaining steady growth in crops when rainfall occurs in brief high intensity storms followed by periods of dry weather. The soil and base rock are receptive to intense falls of rain and there is little runoff, so moisture is rapidly lost to the plant. It is for this reason, especially, that farmers like to crack open the rock by ripping, before planting tree crops, so that the trees can tap the underground reserves through deep root growth. It also reinforces the need for supplementary irrigation.

From the point of view of productive agriculture, distribution of rainfall does not tell the complete story. There is a temperature gradient between the north and south, so that the evaporation is much higher in the warmer southern islands, which are up to 400 miles closer to the equator. Definitive data are not available; however, Little et. al (1977) suggest that for Abaco and Grand Bahama, the rainfall may equal the annual evaporation, while in the Southeatern Islands evaporation greatly exceeds rainfall by as much as 2 times in Mayaguana and 2.5 times in Inagua.

It would appear that this situation has two important consequences for productive agriculture. First, growing conditions are much more favourable in the Northern Islands on a year-round basis. Second, there is a much greater capacity for replenishment of natural underground fresh water reserves in the Pine Islands, which will allow greater use of irrigation to combat the inevitable short-term variability of the rainfall.

Temperature

A most important feature for Bahamian agriculture is the remarkably stable temperatures year round and the complete absence of frost. As shown in Table 3, mean daily temperatures in New Providence vary between a maximum of 77 deg F. to 89 deg F., and a minimum of 62 deg F. to 75 deg F. In Great Inagua, maxima can vary between 82 deg F. to 91 deg F., but minima are virtually the same as New Providence, in the range of 67 deg F. to 76 deg F.

Mean relative humidity varies between 75% and 82% in New Providence and marginally higher, at 79% to 88%, in Great Inagua. This figure conceals the fact that absolute humidity is much lower in the winter (Dec.-Mar.) period, which makes this an ideal period for production of many temperate food crops, particularly vegetables.

TABLE 3 Monthly Variation in Temperature Extremes for Abaco (wet north-west), Exuma (central) and Inagua (dry south-east)

Month	Mean Maximum Temperature			Mean Minimum Temperature		
	Abaco	Exuma	Inagua	Abaco	Exuma	Inagua
January	78.3	79.1	83.7	64.5	69.0	67.5
February	76.7	78.5	82.3	62.7	67.4	67.3
March	79.5	80.9	84.6	66.0	69.1	68.7
April	81.1	84.1	87.6	69.0	71.9	70.2
May	83.7	86.2	87.6	72.1	74.1	73.8
June	86.1	87.4	89.2	75.1	76.1	75.8
July	87.3	88.7	91.2	76.9	78.1	76.3
August	86.9	90.0	91.0	77.1	77.8	75.6
September	86.6	88.1	90.6	76.2	77.0	73.8
October	84.4	86.1	88.8	74.0	75.4	73.8
November	80.9	82.5	86.6	69.6	72.3	70.3
December	78.9	79.4	84.1	66.6	69.8	68.3

Source: Little et. al., Table 3., Page 11.

Moving from winter to summer (May-Sep), with much higher humidity and rainfall, it becomes much more difficult to produce the same group of crops. This is because of higher susceptibility to disease in the more humid atmosphere, and the prospect of crop damage from excessive rain.

The absence of frost because of the small land mass of each island is a unique feature of The Bahamas. With an average of 7 hours of sunshine/day year round and the mild, moist atmosphere, The Bahamas have a production advantage over many other locations which can produce similar crops, but only on a seasonal basis. The close location of The Bahamas to mainland USA, and the regular transport connections to Canada and Europe, provide specific market opportunities to capitalize on the beneficial climate for agricultural production.

Wind

Prevailing winds throughout the islands are from the easterly quarter. In the northerly sector, the prevailing winds are from the northeast from October to April. Although mean wind speed is in the range of 7-10 knots, it is not uncommon to have periods with wind speeds of 15 knots or more, during the winter. Moving southward, the period of northeasterly winds becomes shorter and less pronounced, so that in the southernmost islands the predominant wind direction is east-southeast all year.

Wind creates some specific problems for farmers. There is the loss or damage of fruit and flowers, the breaking of fruit laden boughs or overturning of loosely rooted plants such as bananas, and the loss of soil and plant moisture through the evaporative effect of wind.

Wind appears to be a limitation on banana production, generally, and plantain production, specifically. Farmers appear to adopt certain farm practices, which limit the quality of bananas, as a defence against wind losses. Farmers cite potential wind damage as a reason for growing the smaller Jamaican dwarf banana rather than the taller and heavier plantain, despite the potentially higher income from plantain.

They leave multiple suckers at the base of bearing stems rather than trimming back to one fruiting stem and one sucker, so as to have the greatest chance of a replacement, should the fruiting stem blow over.

Various defenses are adopted against the wind problem. Trees, especially bananas, are planted in deep potholes or in deliberately small clearings in the scrub. Multi-story cropping is adopted, with bananas, citrus and vegetables together, to increase the density of plant material and, hence, reduce the potential for wind damage. In the large vegetable farms, fields are broken into narrow rectangles by growing dense, tall plants such as sugarcane, as windbreaks.

Hurricanes are a special Bahamian problem. While they are not exceptionally frequent, the potential for hurricane damage should be taken into account for long-term agricultural planning. Little et. al (1977) cite data on the frequency of hurricanes over a 92 year period from 1871 to 1963 as follows:

TABLE 4 Incidence of Hurricanes in The Bahamas

Island	Number passing across an island	Number passing within 200 nautical miles
Abaco	8	91
Grand Bahama	16	70
Andros	9	90
Eleuthera	6	85
Cat Island	7	39
Exuma	5	45
Long Island	7	45
Crooked Island, Acklins	9	45
Mayaguana	5	45
Great Inagua	3	45

Source: Little et. al., Table 2., page 7.

The importance of the data is that Grand Bahama, with its otherwise high potential for tree crops, has double the chance of hurricane damage as Abaco or Andros. The crude statistics for incidence of hurricanes are:

Island	Hurricane	Within 200 miles
Grand Bahama	1: 5.7 years	1:1.3 years
Andros	1:10.1 years	Every year
Abaco	1:11.4 years	Every year
Cat Island	1:13 years	1:2.3 years
Eleuthera	1:15.2 years	Nearly every year

The fact that Grand Bahama has a hurricane less than once every six years and that one passes within 200 miles virtually every year does not mean that farmers should not invest in tree crops, or that farmers can expect regular significant losses from hurricane damage. Tree crop production is successfully carried out on a large scale in all the northern islands. In Abaco there is one permanent citrus/avocado orchard more than 16 years old, with a consistent record of regular high production.

It does mean, however, that orchard sites should be selected with care, and that farms should be laid out with an eye to the prevention of possible hurricane damage. Part of any overall plan to mitigate hurricane damage should be the maintenance of national mother stocks of the principal commercial tree plants, which should include improved varieties of citrus, bananas, plaintain, papaw, mango and avocado. The present citrus canker prohibition on Florida citrus is proof that suitable material may not be available when it is most wanted.

At the same time, for their own protection, large tree crop farms, such as those run by citrus growers, should always keep reserves of nursery stock and budding material, which should be regularly replenished.

Soils and Landform

The landforms in each island are a composite of dunes, beach ridges, marshes and plains, some of which are actively forming, and others in various stages of decomposition from prior ages. With the highest point on land being 207 feet (63.7 m) above mean sea level, micro-relief and local conditions are important in determining suitable locations for agriculture in The Bahamas.

Virtually all the land is limestone-based, though the limestone is by no means uniform in structure, density or strength. The limestone vary according to their origin and age, the most important variations being in the type of limestone and degree of hardness. The soluble nature of limestone means that most of the soil is eventually lost in the normal degradation process, and that natural soils are thin and of little structural strength. They are strongly alkaline, of low natural fertility and have a high capacity to lock up applied fertilizer.

Little et. al. (1977) suggest that observed soil differences may be related to minor differences in the base limestone. They describe four general classes of soils:

Limestone Residues - Red and brown lateritic soils

Aluminous Lateritic Soils ("red soils", "pineapple soils", Bahamas red loam"

Occur in low spots and valley bottoms varying from 1-5 acres, between dune ridges and on hillsides held in irregular rock surfaces. Always associated with hard rock, usually shallow, and with poor retention of water and applied fertilizer.

Immature Lateritic Soils ("Brown mineral soils", "Bahamas stony loam")

Occasionally found as shallow continuous soils, they are more often interrupted by rocky outcrop and lie on irregular rock surfaces. Occur widely in the Coppice Island, where they are deepest in "banana holes" and at the foot of ridges, and are widely distributed over the Pine Islands. They are never deep and have low water retention. However, as they are closely associated with soft rock, they can draw water from rock reserves. The better man-made crushed rock soils of the Pine Island plains are of this category.

Organic Soils (Leafmould soils on rock, muck soils)

Substantially fine grained dark-coloured humus covered by less rotted leaves, but may also contain minor amounts of mineral soils. Under natural bushland, the leafmould may cover the entire rock surface, but after slash and burn farming, the rocky outcrops are exposed. These soils rapidly waste away on exposure and are depleted of nutrients. Traditionally cropped for 1 or 2 years and then abandoned. They are unsuitable for sustained farming land preparation or merchandised farming.

Sedimentary Soils (Sandy soils with humus, sandy soils with caliche; limesilt soils)

Of variable character, depending on degree of coarseness of the sand, localized salinity and vegetation cover, which influences the amount of retained humus. Useful agriculturally, as they provide a continuous planting medium, allow plenty of room for root growth and are suitable for the use of light machinery. Most frequently used when located adjacent to fresh water ponds or above fresh groundwater. Potentially subject to salt intrusion.

These soils were historically important for maize production in the central and southern islands. These lands, however, often have great tourist development potential as they are almost invariably adjoin a present day beach, and are suitable for developments such as the golf course at Cotton Bay Eleuthera. (Little et. al. Vol 2a 1976)

Man-made soils (Quarry pit soils, artificially augmented soils of Exuma, heaped up marsh soils of North Eleuthera, prepared rockland (crushed rock) soils)

Muck Soils. Deep peaty soils in periodically flooded hollows. Often deep, though generally waterlogged past one foot. In Exuma they are built up with rock and sand to lift the rooting zone above the water table. In North Eleuthera they are partially drained with local trenches, and built into raised beds for vegetable farming.

Crushed Rock Soils. Created on the open soily rock plains of the Pine Islands by removing the timber, pushing the larger rocks into rows and cracking and crushing the softer base rock with mechanical rippers and heavy disc ploughs. The final result is a soil/rock mixture which can successfully be used for broad acre mechanized agriculture if the soil/rock ratio is suitable. It is also used for permanent tree crops on a minimum tillage basis.

Land Capability Classification

Little et. al. (1977) devised a Land Capability Classification to draw together the results of their various analyses of the land, soil and water situation in The Bahamas.

In Summary, the Classification is:

Tillage Land:

Class 1:	Small individual area of deeper red and brown soils together with "whitelands" (humic sands)
Classes 2 and 3:	Intimate associations of soil and rock (occupying the top 3-18 inches of the ground surface) suitable for preparation as ploughland; Class 2, gravelly; Class 3, stony.

Non-Tillage Land:

Class 4:	Rockland not suitable for ploughing. 4A not steep, 4B steep or rocky ridges.
Class 5:	5A High Watertable hardened rockland 5B Sandy land excluding 5C Steep sand dunes
Class 6:	6A Bare rock land pitted with caves 6B Steepest rockland (> 1:10)
Class 7:	Land susceptible to flooding. 7A Freshwater flooding, 7B Saltwater flooding

Notes

The Survey defined Tillage Class land as:

Class 1. Land with an essentially gravelly or finer (natural) tilth, nowhere less than 6 inches deep.

Class 2. Land which can at varying, but not excessive cost, be reduced by standard heavy tillage implements to a continuous gravelly or finer tilth, nowhere less than 6 inches deep.

Class 3. As for Class 2, but the word stony is substituted for gravelly.

Class 1 applies to soils and sands. Classes 2 and 3 apply to various forms of rocklands.

Suffix letters S, T, W and X indicate land limitations corresponding to;

S, Soil
T, Minor topographic uneveness (<6 feet relative relief)
W, High water table, alternatively an absence of irrigation water
X, Inclusion of scattered, exceptionally hard rock

Double suffixes, i. e. SS, indicate a more severe limitation.

Practically all the land which can be used for agriculture falls into Classes 1-4A. In the Land Capability Map (2), published with their report, Little et. al. (1977) provide some estimates of the areas of the various land capability classes for the principal islands.

The most obvious feature of the data in Table 5 is the predominance of agricultural class land in the three islands of Abaco, Grand Bahama and Andros. Of the estimated total of 164,094 acres, some 132,152 acres, or 80.5%, are found in these three islands. By comparison, Eleuthera and Cat Island, which have historically been big suppliers of farm produce to New Providence, contain an estimated 9127 acres, or only 5.5%, of the agricultural land in the principal islands of The Bahamas.

TABLE 5 Distribution of Agricultural Land by Island and Land Class
All areas acres

Land Class	Abaco	Grand Bahama	Andros	Eleu thera	Cat Isl	Exm	Crkd Ackl	May Ina	Total Each Class	% Each Class
Level										
Sand			270	1169	378				1817	1.11
1				42		90			132	0.08
1S				234					234	0.14
1SW			110	40					150	0.09
1SWW				793			890	3410	5093	3.10
1SSW				313					313	0.19
1SSWW				80					80	0.05
1WW				145	476		420		1041	0.63
1/4A						215			215	0.13
S/tot	0	0	380	2816	854	305	1310	3410	9075	5.53
2	1775	14451	8158	24					24408	14.87
2S			11008						11008	6.71
2SS	600		5568						6168	3.76
2SST	1213								1213	0.74
2T			390						390	0.24
2W	6285		170		410				6865	4.18
2WW	1103								1103	0.67
2 (3)		2476							2476	1.51
2-3		950							950	0.58
2T-3T		1195							1195	0.71
S/tot	10976	19072	25294	24	410	0	0	0	55776	33.99
3-2		1725							1725	1.05
3(2)		9173							9173	5.59
3	5405	5638	15460	190					26693	16.27
3S	13513			697					14210	8.60
3SS	9848		125	1233	313				11519	7.02
3SSX			9815						9815	5.98
3SW				38			480		518	0.32
3SWW				95			150		245	0.15
3SSW				329	130				459	0.28
3SSWW									0	0.00
3T	4823								4823	2.94
3W			115	1359					1474	0.90
3WW	330				131				461	0.28
3WWSS	460			55					515	0.31
S/tot	34379	16536	25515	3996	574	0	630	0	81630	49.75
4A							1750	12600	14350	8.74
4A(C)							2810		2810	1.71
S/tot	0	0	0	0	0	0	4560	12600	17160	10.46
Modif				453					453	0.23
Total	45355	35608	51189	7289	1838	305	6500	16010	164094	100
%Area	27.6	21.7	31.2	4.4	1.1	0.2	4.0	9.8	100.0	

Source: Little et. al. (1977) Map 2. Land Capability.

TABLE 6 Principal Physical Limitations on Class 1-3 Land for Selected Islands in The Project Area

No.	Island	No. Limitation		Principal Limitation						Total
		Ac	%	Soil		Water		Topography		
				Ac	%	Ac	%	Ac	%	Ac
1	Eleuthera	1688	23	3555	49	2046	28	-	-	7289
2	Andros	23798	46	26516	52	285	1	390	1	51189
4	Abaco	7180	16	25174	55	8178	18	4823	11	45355
5	Grand Bahama	34413	97	-	-	-	-	1195	3	35608
7	Cat Island	378	21	443	24	1017	55	-	-	1838
Total		67457		55688		11526		6408		141279
Percentage		48%		39%		8%		5%		

TABLE 7 Comparison of Estimated Area Class 1 to 4A Agricultural Land by Island with Island Area and Census recorded area of Total Farm Land

	Unit	Abaco	Grand Bahama	Andros	Eleu thera	Cat Isl	Exm	Crkd Ackl	May Ina
Land Area	Sq Mile	649	530	2300	200	150	72	132	755
Class 1-4 Agric Land	Acre	45355	35608	51189	7289	1838	305	6500	16010
% Class 1-4 to all Land		10.92	10.50	3.48	5.69	1.91	0.66	7.69	3.33
Census Total Farm Land	Acre	20791	743	6795	9404	29921	2760	2570	na
Class 1-4 as % all Census Farm Land		218.1	4792	753.3	77.5	6.1	11.1	252.9	

An important aspect to consider is the rated quality of the land. Of the 35,608 acres in Grand Bahama, some 34,413 acres, or 97%, have no limiting factor related to soil condition, topography or water. Table 6 recasts the data from Table 5, on the basis of the principal limitation identified by the original survey.

The obvious implication from the figures in the preceding tables is that there are not only greater areas of usable land in the Northern Islands, but also a greater proportion of usable or better class land in these islands. The exception to the rule may be Abaco, where only 16% of the 45,355 acres is rated as free of restraints. This is in marked contrast to Grand Bahama and Andros, with 97% and 46% respectively, of land free of significant physical limitations.

To find a further perspective for the distribution of agricultural areas between the islands, the total areas of Class 1-4A land are compared with total land area of the respective islands, and with the area shown as total farm land in the 1978 Agricultural Census. (See Table 6). It is acknowledged that there have been some developments since that time in land use; however, the comparisons are again revealing. In Eleuthera, only 75% of the land used for farming in 1978 was Class 1-4A land, whereas Grand use for farming in 1978 was Class 1-4A land, whereas Grand Bahama had 48 times as much good agricultural land as was in use at that time. The analysis is set out on the next page.

Overall land area is no criterion of agricultural capability. No island has agricultural class total area, and none of the traditional agricultural islands land equalling more than 11% of has Class 1-4A land equalling more than 5.7% of total area. Some islands, such as Cat Island and Long Island, record larger areas of land in agricultural use than that estimated as being of agricultural capability. That is, they are farming on Class 5 hard rock lands and Class 6 flood land. While farmers appear to have overcome this adversity with some success in the past, the situation does not offer any scope for significant agricultural expansion in the future.

The final issue in assessing agricultural capability for an "Action Plan" is to determine what land is immediately usable. While there are said to be 164094 acres of agricultural class land outside New Providence, the 1978 Agricultural Census recorded only 17706 acres of arable land in all the islands, and a further 4861 acres in permanent tree crops. That is a total of 22567 acres in use, or 14% of the agricultural class land. The census recorded a further 4491 acres in permanent meadows, and the balance of 62510 acres as "wood, forest or other land".

The fact is that the greater part of the potential agricultural land is not immediately usable, as it is under pine forest or coppice. In the case of the pine forest land, there is time lag to be considered in bringing it into use for the full range of agricultural activities which might be warranted.

It takes time to make a soil in The Bahamas. The early experience of BARTAD was that clearing the timber and crushing and ploughing the rockland did not immediately make usable crop land. Early cropping efforts produced poor results, and it was only after several years of cultivation and incorporation of organic material that suitable soil/rock ratios were achieved. The process also required that the excess free calcium carbonate be overcome and soil fertility built up with repeated heavy applications of fertilizer. Once this process had been completed, crop yield began to reach satisfactory levels.

Most of the land currently in use on the Pine Islands for mechanised agriculture has a long history of cultivation. In Abaco, the Sawyer, BAIL, Estates land all have between 12 and 20 years of cultivation. The same applies to the several thousand acres adjacent to the San Andros aerodrome in Andros. If the use of these areas is to be expanded, then it cannot be done overnight.

There is probably little more than 20000 acres of this class of land in Abaco and Andros combined, plus perhaps 1000 acres in Freeport. Of this area, 10000 acres in Abaco has been leased on a long term basis for tree crop development. Of the balance, some 3000 acres in Andros is mostly occupied by squatters and short-term tenants, while some 7000 acres of the BAIL Estate remain uncommitted.

For tree crops, the situation is not so demanding. It is not necessary to have such a high soil/rock ratio, as is the case for cereal and vegetable crops. It is, therefore, possible to envisage clearing, ploughing and planting, on say a 2 year cycle. Timing, however, remains paramount. If the Action Plan foresees an increase in cropped area beyond the immediately useable area of 11000 acres, then it will be necessary to take a long term view of agricultural development in order to be ready when the additional agricultural land is required.

THE FARMING SYSTEMS OF THE BAHAMAS

It is nearly 500 years since Columbus first brought European settlement to The Bahamas, and 357 years since The Bahama Islands were first permanently settled by the Eleutherian Adventures. The fact that the settlers survived, despite the many difficulties created by the poor rocky soils and the scarcity of water, indicates that they eventually developed a sound agricultural system adapted to the local conditions.

Early settlement was concentrated in the central islands, San Salvador, Eleuthera, Cat Island, Long Island, Exuma and Rum Cay. These islands have limited areas of agricultural soils, many of which have restrictions imposed by excessive amounts of rock or poor access to water. The early farmers used the sandy soils or the organic leafmould soils, both of which deteriorate with use and require long periods of fallow under bush revegetation to rebuild the leafmould, which is the source of their nutrient base for plant growth.

As a consequence, the early settlers rapidly developed a shifting agriculture system. Small pockets of better soils were selected, the woodland vegetation cut back, and the cleared land used for two or three years. Without fertilizers, the soil nutrients and structure were rapidly exhausted and the farmer would move on to another area nearby, leaving the land to regenerate. It is estimated by Little et. al (1976 Vol. 2a) that at one time or another, the whole of Eleuthera has been cleared for farming.

It is only in the last 30 years, with the advent of mineral fertilizers, agricultural chemicals and large-scale farm machinery, that alternative forms of land use have ben possible.

Survival has been the historical keynote of Bahamian agriculture. While there have been brief periods where export markets have provided farmers with substantial cash earnings, the small production areas and the transport difficulties between the islands have meant that the overall emphasis of agriculture has been in production of food crops for home use and domestic sale.

In their 1970-76 survey of the land resources of The Bahamas, Little et. al. recognized three farming systems in The Bahamas. The classification is still valid and provides a useful basis for examining future possibilities in Bahamian agriculture.

The No-Investment (Traditional) System

The traditional system continues to be important on the Family Islands, particularly in the drier areas such as Cat Island and islands further south. The system involves selecting an area of scrub or coppice land with a suitable depth of leafmould. The small scrub is cut to ground level and the boughs are lopped off the larger bushes at shoulder height.

The cut scrub is made evenly over the ground to dry, and after a suitable period, of up to several months, is burned. The aim is to burn the weeds and seeds and to sterilize the ground. If the fire is too hot, it may burn some of the leafmould, and thus reduce the available "soil". The residual ash provides an initial fertilizer dressing.

The field is then planted in a mixture of crops. The traditional aim was to maintain a constant supply of fresh food for as long as possible, together with a surplus of storable grain. The grain supplemented the fresh food through most of the year, but became vital in the first few months of the growing season while waiting for the cycle of short-term crops to begin.

The planting season begins with the advent of cooler weather in October, at the end of the summer rainy period. It continues with a series of crops through to the end of winter, when the summer crops are planted. First there are short term vegetable crops; tomatoes, sweet peppers, cucumbers, cabbage, peas and beans. With sequential plantings, these can continue for 4 months, from December to April. At the same time, banana suckers are planted at suitable locations throughout the clearing, so that they will begin to bear fruit at the end of the first year.

Immediately after the first group of vegetable plantings, come the hard vegetables; Irish potatoes for harvest in March-April, and onions for April-May. As the early winter crops mature, they are replaced by summer crops such as maize, which will be ready for harvest by August. The maize is followed by the root crops, cassava and sweet potato. The storable grains, maize and pigeon peas, together with the cassava and sweet potato, will provide the basis for family food survival in the critical October-January period, until the fresh cycle of short-term crops begins again.

The cycle of land use varies over the two to three years for which the piece of land is used. In the first year it is fresh, and the emphasis is on solanaceous, cucurbit and leaf vegetable crops followed by grains. In the second year there is more emphasis on legumes such as pigeon peas, black eyed peas and lima beans, together with root crops, cassava, sweet potato, yams and eddoes.

At the end of this cycle, the pigeon peas, root crops and bananas can remain and be harvested in the third year, without much effort being required to keep the land weed-free. At the same time that bananas are planted, citrus, mango or other fruit trees may be introduced. These will take two or more years to come into bearing, but in the interim, the land is producing food and income from the shorter term crops.

There is, therefore, a cycle of opening a fresh piece of ground each year while continuing with second and third year land. On the better class land, such as that in North Eleuthera, once the land is exhausted for use with short-term crops, it can be used for a longer period under tree crops, which needs considerably less care.

The whole system operates without machinery. The only equipment required is a "cutlass" (machete), which is used for cutting the bush and then for the weeding and planting. A hoe may also be used, especially for weeding on sandy land. Other than the cutlass, the only investment is in the time to cut and burn the bush to prepare the land for use. Historically, where the opportunity cost of labour was little or nothing, and all labour was family labour, the system could be operated on virtually zero cash investment.

The Low-Investment System

A number of things have happened in recent years to change the historical situation of farming in The Bahamas. First and foremost has been the greatly increased opportunity for, and value of, off-farm employment. The loss of family labour has meant that farmers have to use paid labour, which immediately raises the investment threshold for the traditional system of farming by at least the value of the time taken to prepare the land and the cost of labour in crop production.

On the basis of data collected in farmer interviews in Eleuthera, it is estimated that it requires 10 to 15 mandays/acre to cut and burn scrub. At a present value of $15/manday this would set the minimum investment in cut and burn agriculture at $150 to $225/acre, which, over a two-year cropping period, would be $75 to $115/acre/year.

For short term intensive cropping, the general labour requirement is estimated to be on the order of 1 man/3 acres. For semi-permanent crops such as pineapples this could more than double to 7-10 acres/man, while, for permanent tree crops (citrus mangoes), and vegetables and livestock, the labour requirement may reach to 12 to 15 acres/man.

The other significant change has been the advent of modern agricultural inputs - bagged fertilizer, herbicides, pesticides and improved seed varieties. All these inputs cost cash, so the farmer must re-examine his cycle of production to at least recover the cash investment. This implies the selection of crops on the basis of greatest cash return, rather than on the criterion of year round food supply, mentioned earlier.

It has had the effect of increasing the proportion of the farm put under vegetables, at the expense of root crops and, to a lesser extent, maize. This, in turn, has meant that more of farm output is perishable and that there is less emphasis on the food security aspect of grain and root crops to feed the family. There is also the fact that with substantial out-migration of people from the Family Islands, farmers have fewer mouths to feed, which reinforces the trend towards the cash economy, and away from the self-sustaining style.

Modern agricultural inputs have also had a beneficial technical impact on the traditional slash and burn system. The traditional system moved to fresh land each year because it had to. Fertility was naturally low, and

was rapidly depleted by intensive land use. Heavy use of fertilizer now allows for much longer periods in the one location, and a farmer can look for longer payback periods for higher investment.

The combination of technical opportunities and economic pressures has led to the emergence of the "Low Investment" system of farming, which could now be considered the predominant system of land use in The Bahamas. While it retains elements of the slash and burn system, it is much more stable in relation to given pieces of land.

A farmer may now continuously occupy a much larger area of land, within which he rotates his crop production. New land will be simultaneously planted in vegetables, bananas and permanent tree crops. The vegetables provide the initial cash flow, the bananas and root crops follow, and after three to four years the land can become a permanent orchard, with perhaps a 20 year life span. The farmer can afford to fence the land, as he has sufficient time to recover the cost of doing so. He may, therefore, run sheep in the orchard to control the weeds and to diversify his income and reduce his dependance on labour intensive production.

One benefit of this system is that it allows the farmers to concentrate on the best land, and to undertake longer term strategies such as green manure cropping or the incorporation of organic material into the soil. In Long Island, the advent of heavy tractors has allowed farmers to crack open the hard rock surface and create pits or low level gardens where the fresh water table is just below the surface.

In Exuma, farmers have built substantial gardens on mulch soils or "shag pond land" where they have filled in low-lying land above the water table and created permanent crop land. Other investments may include deep ripping lines prior to planting orchard areas, to allow deep rooting of permanent trees to the water table, or the hand clearing of rock to create clear fields, so that plastic mulch weed control can be used under pineapples.

Additional study must be done in order to have an updated picture of the investment/cost of the production/revenues situation within this group of farmers. That will be crucial for the design of an appropriate strategy for agricultural development, especially on the Southeastern Islands.

The High-Investment System

Since the 1930's there have been a small number of non-Bahamian investors who have attempted large-scale mechanised agriculture in The Bahamas. Austin Levy at Hatched Bay, and A. V. Davis at Rock Sound were two pioneers of this style of farming. A number of entrepreneurs attempted large-scale vegetable farming in Abaco and North Andros, only to withdraw after a few years.

The most successful venture of this type has been Key and Sawyer Farms, which until recently were Bahamian-owned and are still Bahamian managed. This farming business has a 16-year history of successful large-scale production of export vegetables, and more recently has moved into permanent tree crop production.

This style of farming is modern, mechanised, broadacre agriculture. It requires clearing relatively large areas of land, by Bahamian standards, ploughing up the rock to make soil, and laying out a flat land farm. The costs of doing so are quite high. However, if a sufficiently long time period is available to recover the investment, the development costs can be worth-while. This system is more appropriate for export agriculture, although the domestic market could also be supplied by farms operating on a high-investment system.

LAND TENURE AND SETTLEMENT ISSUES

The Bahamas comprises an area of about 100,000 square miles (227,320 sqr. km.), representing an archipelago of over 700 islands and cays. Most of the territory therefore consists of water. The land area is estimated at only about 5% of the territory of 5,353 square miles (13,864 sqr. km.). Of the total island area, about 500,000 acres are considered to represent arable land, suitable for agricultural use. However, it is estimated that only about 90,000 acres or 18.0% are being exploited at the present time.

Although commercial agricultural activities already take place in about eleven of these islands, which themselves demonstrate potential for increased production of certain crops, the most promising opportunities for improved productivity and output lie in the Northern Islands, commonly referred to as the Pine Islands.

The major constraints to the expansion of commercial agriculture among the Southeastern (or Coppice) Islands consist primarily of marginal soils and limited water availability. In addition, relatively high land preparation costs, an inevitably high dependence on fertilizers and chemical applications, and above-average unit cost for transportation (for both input supplies and farm products), further limit the prospects for commercial farming in these islands.

Farm Size and Distribution

The Agricultural Census of 1978 recorded 4246 individual farming enterprises utilizing 89,611 acres of land in The Bahamas. In designing an appropriate programme to promote further development of agriculture, it is necessary to examine more closely the distribution of farm size, the location of farming in the islands and the intensity of land use.

Farming land is unevenly distributed among farmers in The Bahamas. To interpret the situation, Census data have been condensed into five farm-size categories. These categories are intended to represent the likely farming systems employed and the potential for future development.

The categories selected are:

Less than 2 acres	Most likely to be a part-time farmer operating in the Low Investment system.
2 - 5 acres	A one-man farming operation.
5 - 20 acres	More than a one man farming operation. Will need labour assistance at least for harvesting. Some opportunity for capital accumulation and investment.

20 - 200 acres	Potentially a farming business with paid wage labour and sufficient cash flow to permit investment in mechanized farming methods.
Greater the 200 acres	Mostly large scale professional farms, all paid labour, mechanized and technically sophisticated.

Table 1 Number and Area (in acres) of Farm Holdings in The Bahamas by Farm-Size Category

Farm Size Class	Unit	Farms <2ac	Farms 2-5ac	Farms 5-20	Farms 20-200	Farms >200	Total Farms
Total Farms	NO	1806	1188	983	227	42	4246
	Area	1548	3563	8651	10091	65758	89611
Percentage by Farm Size Class	NO	42.5	28.0	23.2	5.3	1.0	100.00
	Area	1.7	4.0	9.7	11.3	73.5	100.00

The data demonstrate sharply uneven farm size distribution. About 43.0% of individual farms measured less than 2 acres and about 71.0% less than 5 acres. Collectively they comprised not much more than 500 acres or 5.7% of the recorded farm area in The Bahamas. At the other end of the scale, there were 42 farms (1% of the total) said to be greater than 200 acres and these occupied 65,758 acres or 73.4% of aggregate farm area. Farm land is not only unevenly distributed among farmers, it is also unevenly distributed among islands. The general distribution among the islands is given in Table 3 which reveals the difference between the Northern and the Southeastern Islands.

Table 2 Number and Area of Holdings by Island Group and Farm Size Category

Farm Size Class	Unit	Farms <2ac	Farms 2-5ac	Farms 5-20	Farms 20-200	Farms >200	Total Farms Island	Percent
Northern Islands	NO	958	340	273	57	9	1637	38.6
	Area	732	981	2228	2326	27634	33901	37.8
Southeastern Islands	NO	848	848	710	170	23	2599	61.4
	Area	816	2582	6423	7765	38124	55710	62.2
Total	NO	1806	1188	983	227	32	4236	
	Area	1548	3563	8651	10091	65758	89611	

Source: Agricultural Census, 1978/FAO Report

About 81% of the better agricultural class-land is in the northern Islands of Abaco, Grand Bahama and Andros. Yet the fact is that 62% of the land used for agriculture is in the Southeastern Islands. This has, however, been of a traditional pattern and does not provide a basis to guide development of the agricultural sector.

In order to take advantage of modern agricultural practices and potential, it will be necessary to shift the focus of Bahamian agriculture in order to exploit the better conditions in the Northern Islands.

Table 3 Number and Area of Holdings by Island and Farm Size Category

	Unit	Farms <2ac	Farms 2-5ac	Farms 5-20	Farms 20-	Farms >200	Total Farms	Percent Island
New	NO	141	118	153	23	2	437	10.3
Providence	Area	116	355	1322	1015	1764	5572	6.2
Grand	NO	116	11	6	1	1	185	4.4
Bahama	Area	76	32	53	34	548	743	0.8
Abaco	NO	224	47	24	7	2	304	7.2
	Area	172	136	167	186	20130	20791	23.2
Andros	NO	427	164	90	26	4	711	16.7
	Area	368	458	686	1091	4192	1795	7.6
Cat Island	NO	86	181	137	36	10	450	10.6
	Area	97	592	1048	1301	16883	29921	33.4
Eleuthera	NO	230	187	195	39	6	657	15.5
	Area	182	568	1807	1876	1971	1404	10.5
The Exumas	NO	201	179	56	12	3	451	10.6
	Area	216	546	427	466	1105	1760	3.1
Long Island	NO	81	168	281	71	6	607	14.3
	Area	76	479	2783	3501	1378	8217	9.2
Rest of	NO	250	133	41	12	3	444	10.5
Bahamas	Area	245	397	358	621	3787	5408	6.0
Total Farms	NO	1806	1188	983	227	42	4245	100.0
	Area	1548	3563	8651	10091	15758	89611	100.0
Percentage	NO	42.5	28.0	23.2	5.3	1.0	100.0	
by Farm	Area	1.7	4.0	9.7	11.3	73.4	100.0	
Size Class								

Source: Agricultural Census/FAO Report.

Table 4 above sets out in more detail the number of farms and the areas used in the individual islands. In terms of the numbers of farm holdings, the dominant islands are Andros, Eleuthera and Long Island. Cat Island and the Exumas have among them 2165 farms (51%) and 50,302 acres (56.2%) of the land area in use for farming. The Land Resources Surveys had estimated that these islands had only 9463 acres of agriculturally suitable lands. The implication, therefore, is that much of Bahamian agriculture is being carried out under conditions of great difficulty and, in terms of available land resources, on very marginal lands.

The FAO Report cautions that the reported amount of land in agricultural use must be intepreted with care. It seems quite apparent that there is not necessarily the same intensity of land use between the smaller and larger farms. Many of the larger holdings can be identified individually as having either only a small portion in use or even no effective agricultural use of the land at all.

The example of under-utilization was given for the BAIL Estate on Abaco. The property consists of 17,200 acres and is shown in the Census as one of the two properties on Abaco being greater than 200 acres. However, the fact is that the BAIL Estate was out of production and the land was idle between 1971 and 1984. Currently 10,000 acres of the Estate have been leased for a long-term export citrus development.

Another example is the 10 properties said to total nearly 27000 acres on Cat Island. No farming on this scale has taken place in Cat Island since the 18th Century. These large holdings are in part a residue of the plantation cotton farming period and do not in any way reflect the presence of large-scale farming on Cat Island in 1978.

The FAO country mission attempted to clarify the situation of large farms in The Bahamas. Of those farms said to have over 200 acres in production or active use, fifteen were identified to be either in production or in some stage of development as of 1986. The area and location can be estimated as set out in Table 4.

No large agriculturally productive holdings actively in use existed on any other island. At the time of the Agricultural Census it was estimated that of the 65,758 acres in the large-farm sector (greater than 200 acres), 54,404 acres or 83% of the land was "wood, forest or other land." In 1978, of the 11,354 acres in productive use, only 2950 was in short-term crops and 699 acres in tree crops. The balance of 7706 acres was comprised of meadows or fallow.

Table 4 Estimate of Number, Location and Total Area (acres) of Operational Farms over 200 acres in The Bahamas -September 1986-FAO Report

Island	Number	Area (acs)	Activity
Grand Bahama	3	2900	Export orchards, 1900 acs bearing and 1000 acs in development.
Abaco	2	8000	Export orchards; 3000 acs in production and 5000 acs in development.
Andros	4	4000	Land not farmed by owners. Some of the area farmed by tenants and squatters for local market production.
Cat Island	1	5400	Extensive grazing.
Eleuthera	5	3800	Local and export production. Does not include 1200 acs of Hatchet Bay Estate now abandoned.
Total	15	24100	

The aggregate figure of 89,611 acres recorded as agricultural lands may therefore be misleading. The data may overstate the "real" agricultural land by as much as 54,000 acres, or more than half the area of 89,611 acres recorded. It can only be said that at all times the data for the large-farm category should be interpreted with care, especially when assessing the resources available for Bahamian agriculture.

The Structure of Farm Holdings (and the Tenure of Agricultural Land)

The difficulties of attempting to farm the hardrock lands of the southeast represents a unique Bahamian problem. Naturally available arable lands are quite limited in the south and it is therefore necessary for farmers to operate non-contiguous parcels of land.

Table 5 illustrates the fragmentation problems, presenting the distribution of land parcels cultivated with respect to acreage. Only 41% of farms are in one parcel, 45% are in 2 or 3 parcels and another 11% are in 4 to 5 separate parcels. Seventeen farms were recorded as having more than 10 different pieces of land in use at one time.

Operating on small pockets of land at scattered locations places a specific restriction on the capacity of farmers to improve farm efficiency through mechanization and capital investment.

TABLE 5 Fragmentation of Farm Holding

Farm Size Class	Unit	Farms <ac	Farms 2-5ac	Farms 5-20	Farms 20-200	Farms >200a	Total Farms	%
1 Parcel	NO	1028	342	275	57	12	1714	40.9
	Area	734	969	2134	2701	13244	19782	22.1
2-3 parcels	NO	649	636	486	108	19	1898	45.3
	Area	692	1892	4585	4346	27832	39347	43.9
4-5 parcels	NO	79	184	138	38	9	448	10.7
	Area	104	605	1155	2006	11119	14989	16.7
6-9 parcels	NO	5	25	66	18	2	116	2.8
	Area	8	90	640	751	13564	15053	16.8
>10 parcels	NO	1	1	9	6		17	0.4
	Area	1	5	108	310		424	0.5
All Farms	NO	1762	1188	974	227	42	4193	100.0
	Area	1539	3561	8622	10114	65759	89595	100.0

Source: Agricultural Census, FAO Report

Land Tenure

Another feature of Bahamian agriculture causing difficulties for development is the matter of land tenure. It affects both the way in which the land is held by farmers for their current operations and the access to additional land of persons wishing to become farmers or to expand their farming activities.

In The Bahamas there are four categories of land tenure, classified on the basis of occupancy and ownership status. These are:

Generation property: These lands are essentially "family lands" which have remained occupied by successive generations over time. These lands cannot be sold or transferred outside of the family although there could be some element of fragmentation with respect to occupancy.

Commonage lands: These lands are available for use by all individuals within a community, but are owned by none. Collective community decision-making may be applied in ratifying or vetoing the use of these lands by other persons within a particular community. The communal exploitation of commonage land does not serve to prevent fragmentation into small uneconomic units and there is usually a limited willingness and ability on the part of

individual farmers to invest in fixed capital improvements. Fragmentation usually results from inadequate capital and labour resources to exploit large areas. These constraints have served to limit the full exploitation of these land resources. The principle of holding such lands in common, however, provides a very promising framework within which government support of agricultural development can be effectively carried out, for example, as in land preparation for large contiguous parcels, crop care and protection and post-harvest activities.

Crown lands: These are lands owned by the government. It is estimated that there are about 2.0 million acres of these lands. Further, these lands provide the most promising land resource potential for agricultural development. About 400,000 acres of these lands are in natural forests, which will require that the issue of land-use rationalization be addressed.

Private property: This is usually occupied on a freehold basis with the owner having a registered title to the land.

It is necessary to establish the extent of possibilities (as regards specific crops, acreages, marketing and agronomic requirements) for expanded commercial agriculture in the Southeastern Islands and to organize a system for wide-scale preparation, since the present scale of operations is considered to be too small and uneconomic.

Table 6 presents data on land tenure for farmers in The Bahamas. Seventy-two percent of farmers own their land or hold it in ownerlike possession. This in fact overstates the position as "ownerlike possession" mostly means "generation land."

TABLE 6 Number and Area of Farm Holdings by Farm Size Class and System of Land Tenure (Acres)

Farm-Size Class	Unit	Farms <2ac	Farms 2-5ac	Farms 5-20	Farms 20-200	Farms >200	Total Farms	% Each Class
Farm owned consisting of:								
1 Parcel	NO	779	264	240	33	9	1345	44.8
	Area	565	746	1856	1547	11692	16406	26.7
2-3 Parcels	NO	461	428	365	90	12	1356	45.1
	Area	505	1262	3600	3437	23281	32085	52.3
4-5 Parcels	NO	54	101	57	25	3	240	8.0
	Area	74	319	472	1487	9108	11460	18.7
6-9 Parcels	NO	4	18	23	10	1	56	1.9
	Area	6	62	238	452	548	1306	2.1
>10 Parcels	NO	1	1	5	1		8	0.3
	Area	1	5	47	50		103	0.2
Total owned or in ownerlike possession	NO	1319	812	690	159	25	3005	71.6
	Area	1151	2394	6213	6973	44629	61360	68.5
Farms rented rental system:								
mixed money/ produce	NO	50	45	39	5	2	141	82.9
	Area	29	137	358	216	1352	2092	95.3
Share-crop	NO	7	3	4			14	8.2
	Area	7	8	31			46	2.1
Other	NO	6	5	4			15	8.8
	Area	7	16	35			58	2.6
Total Farms	NO	63	53	47	5	2	170	4.0
	Area	43	161	424	216	1352	2196	2.5
Other Tenure Squatter	NO	220	111	50	5	3	389	9.3
	Area	186	329	387	200	681	1783	2.0
Other Single Form Tenure	NO	21	21	33	26	2	103	2.5
	Area	19	65	274	1456	400	2214	2.5
Mixed Tenure > 50% Owned	NO	47	67	62	16	7	199	4.7
	Area	54	225	514	661	15683	17137	19.1
Other	NO	92	123	99	16	3	333	7.9
	Area	88	348	789	590	3014	4865	5.4
All Farms	NO	1762	1187	781	227	42	4199	100.0
	Area	1541	3558	8601	10096	65759	89555	100.0

Source: Agricultural Census, 1978/FAO Report

The Bahamian government promulgated a policy of non-alienation with respect to the commercial exploitation of those land resources owned by the government. This policy prohibits the transfer of public property to private ownership on a fee-simple or freehold basis, but rather on a leasehold basis. The disposal of Crown Lands has always been a controversial subject and the Department of Lands and Survey has the responsibility of executing the Government policy in this respect.

Crown Lands are transferred by conditional Purchase Leases, which require the fulfillment of specific conditions, such as carrying out developments of a particular type and value. These leases are usually issued for land in the larger islands. At present they apply mainly to residential allotments for expanding of settlements and townships.

Alternatively, long leases of Crown Lands are also granted. They may be for residential, recreational or commercial projects and are granted for a period varying from five (5) years to twenty-one (21) years, depending on the size of the investment and, the nature of the development proposed. Land required for agricultural use is granted under leasehold tenure, which can normally be extended for a period of five (5) years.

Another form of tenure, the Annual Tenancy, is popular. It is more readily granted than any other form of tenure, since it does not give permission to plant permanent crops or erect permanent structures. Tenure on the basis Annual Tenancy can be terminated at any time after the first year. Generally, this type of tenure is issued to small-scale peasant farmers for subsistence farming and rural homesteading on a non-permanent basis. Annual tenancies are made available at a low cost in order to meet the needs of the people in the Family Islands.

The terms and conditions relating to the availability of government lands for private sector agricultural development in The Bahamas need to be much more clearly articulated within the context of a general land-use policy. The agricultural component of such a policy should, among, other things, consider:

a. The locational possibilities for devoting increased acreage of arable lands to agricultural development, bearing in mind soil, water and other environmental considerations.

b. The precise terms and conditions of leasehold occupancy in the case of Crown lands (e.g. size of holding, administrative procedures, period of occupancy, conditions for transfer of capital improvements, etc.), by location if necessary. In cases where government assistance would be required for capital improvement, such as in the case of commonage lands, the main would concern land-use in order to ensure that cropping patterns fulfill the requirements of an overall financing and marketing strategy.

c. The establishment of a special unit within the Department of Agriculture or the Department of Land and Surveys to expedite the major requirements for an improved land policy, with particular reference to agricultural development.

d. The extent to which land use arrangements involving leasehold could provide a basis for accomodating improved provision of credit for capital development. Under the present system, leased lands cannot be used as collateral security for credit. The possibilities in this area need to be further investigated with a view to developing appropriate mechanisms within a government dominated leasehold environment to facilitate agricultural credit.

Project Implications

The extent of the possibilities for increased commercial agricultural production in the Northern Islands has to be precisely established (on the basis of agronomic assessment, marketing possibilities and physical land-use surveys) and the necessary land requirements made available to investors on a programmed basis. The relevant project inputs will be:

a. A forestry, soil and water conservation expert to address the issue of land-use rationalization.

b. The provision of international technical assistance either by way of training or with personnel to expedite such requirements as preparation of physical land surveys, designing appropriate leasehold conditions, developing the administrative and supervisory aspects of a national leasehold system, land management, etc.

c. The provision of assistance by the Government in initial land preparation. Adjustments to the present structure tenure physical of land will be inevitable, but this will have to be made on a well structured and rational basis, taking into consideration labour supply and capital availability.

In the Southeastern Islands, the focus will be on areas where land preparation represents high capital cost, but where there is scope for working with contiguous parcels. Areas having no unsurmountable physical or social constraints to a viable agricultural development programme will have to be given priority. Development or upgrading of necessary support infrastructure such as water supply and access roads is required.

THE BAHAMIAN CAPITAL MARKET AND AVAILABILITY OF CREDIT

The Bahamas have a well-established financial system. A substantial proportion of financial activity, however, relates to offshore banking operations representing enclave-type activities which are not directly linked to the domestic capital market. The institutional breadth of the Bahamian capital market is fairly limited in comparison to most other Caribbean territories. The major institutions are commercial banks, finance companies, trust companies and life insurance companies. As of September 1988, there were 382 banks and trust companies licensed to operate in The Bahamas. Of this number, there were 184 having a physical presence, 55 of which were restricted in the types of business transacted.

The domestic banking sector itself is served by nine commercial banks, with 44 branches. There are also about fifteen other local financial institutions. All but five of these local financial institutions operate exclusively in the offshore market. In addition, there are also about 47 full-fledged trust companies, most of which carry out some deposit taking and banking activities. Long-term savings are mobilized by 4 life insurance companies, which operate exclusively in writing life insurance, and 17 which carry out both life and nolife business.

The financial system, as is the case for most business activity, is concentrated in Nassau. Commercial bank branches exist only in 8 islands outside of New Providence. Among the Southeastern Islands, branches are located only in Eleuthera, Long Island, Exuma and Inagua.

The commercial banks, therefore, essentially are the foundation of the Bahamian financial and capital market structure. The economy being very open, policy is designed primarily to protect the exchange rate by the maintenance of adequate levels of international reserves and ensuring stability in domestic interest rates.

The predominant financial instruments through which domestic capital resources are mobilized are savings and time deposits in the case of private institutions, and registered stocks and treasury bills in the case of government. As of December 1988, savings and fixed deposits in the commercial banking system at the credit, of Bahamian residents, amounted to $619.2 million. Outstanding Bank credit amounted to $772 million, 55% of which is personal credit (a high percentage of which may be for consumption purposes), and 14% representing credit to the distribution sector. Credit to agriculture from the commercial banking system is the lowest of all categories, amounting to much less than 0.5% of outstanding balances.

Credit Policy

The Bahamas has an open economy in which: (i) the goods produced tend to be exported; (ii) the goods sold locally tend to be imported; (iii) the services both produced and consumed within the economy tend to be goods; and (iv) a considerable amount of services are exported in the form of tourism, offshore banking and insurance services. The role of monetary policy, therefore, is limited by external considerations, and is heavily influenced by developments in major trading partners. The extreme dependence on trade that The Bahamas faces, with an import/GNP ratio of Inflation in The Bahamas is predominantly imported, so price increases in the rest of the world are directly transmitted to the local economy through the exchange rate. Consequently, the Central Bank has traditionally pursued a policy of credit restraint, allowing sufficient growth in external reserves to mantain confidence in the exchange rate system.

Instead of frequent adjustment of interest rates, the Central Bank influences local credit by managing liquidity through the placement or withdrawal of National Insurance Board deposits in or from the banking system. Also, the Central Bank has used traditional instruments of monetary and credit control, including open market operation, by buying and selling securities to influence the capacity of commercial banks to expand credit.

There has been, in recent years, substantial growth in both deposits and foreign assets in commercial banks. In 1985/86, deposits grew 13%, while net foreign assets grew 23%. The most impressive increase took place in demand deposits, which grew at a rate of 23%. Demand deposits from the Government, which increased substantially in 1986, almost doubling the previous balance of 1985, continued to grow through September 1987.

Fixed (term) deposits represent almost half of total deposits, and registered the slowest growth rate over the last years, reflecting a shift in portfolios towards savings and demand deposits. The increase in deposits, due to an increase in domestic savings, was probably the result of the economic performance over the last years, since interest rates on deposits decreased during this period. Also, the increase in net foreign assets in commercial banks, as well as in other institutions, was the result of the improvement in the balance of payments and the increase in the availability of foreign exchange.

Since June 1974, when statutory reserve requirements came into effect, commercial banks have been required to hold 5% of their Bahamian dollar deposits as reserves. Towards the end of 1987, commercial bank reserves had grown far above required levels, and short-and medium-term credit increased. The combined effect of excess reserves in the banking system, as well as in internal reserves, led the commercial banks to expand consumer lending by an estimated 20% during the second semester of 1987. This rapid growth of consumer credit contributed to the loss of net international reserves. In January 1988, the Central Bank raised the

rediscount rate in order to slow down both consumer credit growth and reserve losses. As a result, credit availability was restricted during the first quarter of 1988. This situation is likely to continue in the medium term until foreign reserves increase.

Interest Rates

The degree of development of the financial sector of The Bahamas is reflected in the structure of interest rates. The discount rate declined from 10.0% in 1982 to 7.5% in 1986, where it remained throughout 1987. Since April 1986, the prime rate charged by commercial banks has stayed at 9%, down from 11% in 1982. Rates for the different types of loans are based upon and adjusted to the prevailing prime rate plus commissions and fees, depending on the type, risk and terms of the loans. Interest rates in general, both active and passive, have declined over the period 1982-87, following the reduction in the discount and the prime rate. Deposit rates have dropped from a weighted average of 7.6% in 1982 to 5.6 % in 1986, and to 5.4% in September 1987. The range in passive rates for this time period fluctuated between 10.0% and 17.9%, with advances and personal loans having the higher rates.

With the raising of the rediscount rate in January, 1988, the Central Bank also established a ceiling for interest rates on term deposits at a maximum of 8%. The prime rate remained at 9%. To avoid a transfer, no adjustments were made in lending rates, but the availability of credit has diminished.

Oustanding Credit

Commercial banks under the supervision of the Central Bank engage in providing credit to the productive sectors, including agriculture, fisheries, manufacturing, and tourism. However, this is not the most important part of the commercial banks' portfolio, since most of their credit is oriented towards short-term personal consumer loans. As of September 1987, there were over Bh$178 million in outstanding loans from the commercial banks to private productive sectors. This represents 23.3% of total commercial bank credit, from a total portfolio of Bh$765 million. Despite this small portion of lending to the private productive sectors, commercial banks provide the majority of short-term credit allocated to these sectors. Outstanding credit to agriculture, fisheries, manufacturing and tourism totalled Bh$105 million in 1987. Manufacturing and tourism accounted for about 13.0% of the total credit to all sectors, services and transportation for 9.3%, and agriculture and fisheries for less than 1%, as shown below.

Sectoral Distribution of Commercial Bank Credit to the Private Sector (Bh$000)

	1982	1983	1984	1985	1986	1987
Agriculture	2,248	2,469	2,282	2,642	2,443	3,177
Fisheries	3,173	3,490	3,383	3,720	3,175	3,989
Manufacturing	13,442	13,321	13,054	27,187	39,872	47,907
Tourism	41,001	43,022	51,693	46,752	51,906	51,950
Serv. Enterprises	30,692	35,228	33,986	37,919	40,877	53,360
Transportation	13,927	13,533	13,599	14,884	17,960	18,119
Subtotal Productive Sectors	104,483	111,063	117,997	133,134	156,233	178,502
Grand Total	478,283	504,489	530,205	594,894	677,113	765,009

Commercial bank credit, generally short-term and for working capital purposes, is not directly comparable to BhDB credit activities, which are mainly long term and for fixed assets purposes.

The Bahamas Development Bank, which was established in 1974, has been charged with the principal responsibility of mobilising capital resources, in the form of credit and technical assistance to the productive sector of the economy, thereby facilitating the process of economic development.

The bank, as of December 1987, had available resources amounting to $13.34 million, about 50% of which represented paid-up capital. Funding is provided from both domestic and external sources. The major sources of domestic funding are the paid-up capital and lines of credit from domestic institutions such as, the Central Bank and the National Insurance Board. Normally, domestic resources are accessed at 3% below the existing market rate. External funds are provided through loans and lines of credit from international lending agencies such as, the Inter-American Bank, the Caribbean Development Bank and the European Development Fund. The following table provides a breakdown of the bank's resources as of December 31, 1987.

Table 9 BDB Resources on December 31, 1987

Source	Amount ($mill)	Percentage
Paid-up Capital	6.75	41.0
Caribbean Development Bank	2.90	18.0
Central Bank of The Bahamas	2.50	15.0
European Development Fund	0.89	5.0
National Insurance Board	3.42	21.0
TOTAL	16.46	100.0

Source: BDB Annual Report

The bank has authorized share capital of $50.0 million with $6.75 million fully paid up. There are, however, proposals to increase the paid-up share capital to $10.0 million by 1989. A profit of the bank's performance is presented in the following table.

Table 10 Performance Indicators: Bahamas Development Bank

Item	1982	1983	1984	1985	1986	1987	Average Annual Rate of Growth %
Number of Applications	329	263	161	192	492	455	6.7
Loans Approved (NQ)	109	97	63	52	157	200	1.0
Rejection Ratio (%)	67.0	63.0	61.0	73.0	61.0	54.0	-
Loans Approved ($million)	2.5	3.7	3.3	2.0	4.9	5.1	15.4
Average Size of Loans ($)	22.936	38.144	52.381	38.462	31.210	24.402	-
Amount Disposed ($ million)	1.4	3.3	1.7	1.0	2.9	4.7	-
Disbursement (%)	56.0	89.2	52.0	50.0	59.2	92.2	-
Amount Outstanding ($million)	4.5	7.0	7.4	6.4	7.7	12.1	-
Net Income (Loss) ($million)		.80	(.03)	(.44)	(.10)	(.21)	(.17) -

The average size of loans approved by the bank since its inception is about $30,000, indicating that its clientele has been primarily smaller to medium-size businesses. The relatively high rejection ratio of applications may also be reflective of this particular market, and suggests need for improvement in the area of project preparation.

A sectoral breakdown of the average size of loan approvals by the bank is presented in the following table (Table 11) for the period 1982 - 1987.

Table 11 Sectoral Breakdown of BDB Loans

Sector	1982		1983		1984		1985		1986		1987		Total 1978-87	
	NO	Amt.	NO	Amt.	NO	Amt.	NO	Amt.	NO	Amt.	NO	Amt.	NO	Amt.
Agric.	38	8.510	25	10.054	15	10.672	12	12.607	12	8.836	9	23.056	150	10.774
Fish.	38	28.804	29	37.134	20	36.971	16	34.018	39	25.736	76	19.870	299	16.332
Transp.	8	67.635	6	76.716	5	262.946	6	169.985	12	78.176	14	40.092	61	98.820
Manuf.	7	44.626	8	151.500	11	48.339	8	14.463	10	18.940	17	19.725	95	42.337
Toursm.	2	14.626	7	28.457	6	28.333	4	10.167	24	36.426	23	35.712	85	41.303
Servs.	16	14.973	22	23.473	8	50.067	6	25.084	60	30.108	70	24.393	201	25.840
Total	09	22936	97	38144	63	52381	52	38462	157	31210	109	24401	891	31699

Source: BDB Annual Report

The highest level of activity has been within the fisheries sector, which accounts for about 34% of approvals and about 27% of the bank's loan portfolio. Although approvals in agriculture account for about 17.0% of total approvals, they represent only about 5% of the loan portfolio. Agricultural loans are also of the lowest average value in terms of size.

The bank reports that it has been making a special effort to cater to the farm sector, but attributes the relatively low level of project lending to difficulties in obtaining acceptable securities from borrowers. The virtual absence of registered titles to farm lands, and the predominance of generation and commonage properties in the agricultural areas, represents a major constraint to collateral financing in The Bahamas.

The configuration of loans provided varies according to the enterprise. Normally, loans are extended for a period of 7-15 years (land = 7-10 years and crops = 5 - 10 years). A 30.0% equity provided by the borrower is normally requested, but in some cases, e.g. fishing, it can be as low as 10.0%. Interest rates range between 10-12% and vary according to the size of the loan. For example, 10% is charged on loans of up to $100,000, and 11-12% on loans above that amount. There is also some degree of flexibility exercised with respect to moratoriam on principal payments.

The financial performance of the bank, as regards profitability, has been less than satisfactory. Constant losses have been registered for most years since its inception, and as of the end of December 1987, accumulated losses of $914,009 were reported. Low levels of profitability have been attributed to such factors as high, inescapable overhead costs, low operating margins and losses from defaulting borrowers.

The Bahamian Development Bank provided the most potentially effective institutional mechanism through which increased capital resources could be deployed for agricultural development. In order to more fully exploit this

aspect of the bank's activities, it will be necessary to increase its capital resource base, while simultaneously strengthening its institutional capabilities.

A much more structured relationship, through which resources from the domestic capital market can be tapped by the bank on an ongoing basis, needs to be established. Discussions on this subject, which have been taking place with the Central Bank and the National Insurance Fund, are desirable and should be pursued further.

A major constraint to the effective provision of farm credit in The Bahamas relates to the peculiar system of land tenure which exists. With limited access to free hold registered properties, lands cannot be extensively used as collateral in securing loans.

Other forms of providing collateral for loans will, therefore, have to be developed by lending institutions which provide agricultural credit. This represents a particular challenge to the Development Bank, as the principal provider of credit to agriculture. The Bank will have to appreciably improve its capabilities in areas such as, project preparation, and project appraisal, supervision and monitoring, in order to better fulfill its leadership role in development financing.

The Agricultural Credit Fund, which was established with USAID support in 1976, represented an approach to dealing with the problem of providing adequate non-collateral security for agricultural loans. Under this programme, the government provides guarantee for the repayment of agricultural loans extended by participating financial institutions. It has not worked very well, and there has been a lack of enthusiasm among the participating financial institutions.

The issue of collateral security and other related aspects of agricultural credit in The Bahamas will have to be examined in great detail in designing any programme for agricultural development. There are, however, a number of possibilities which could be explored; for example, making greater use of the principal crop-lien, improved integration of marketing arrangements (i.e. the Packing Houses and Produce Exchange) with the loan administration arrangements, and greater use of marketing cooperatives as collection points.


Longitude West 78° of Greenwich
75°
72°
Melbourne
Palm Bay
Vero Beach
Fort Pierce
Stuart
Lake Okeechobee
West Palm Beach
Palm Beach
Lake Worth
Boynton Beach
Delray Beach
Boca Raton
Pompano Beach
Fort Lauderdale
Hollywood
Miami Beach
Miami
Biscayne Bay
BISCAYNE N.P.
Elliott Key
Key Largo
Islamorada
Long Key
Orange Cay
Florida Bay
Keys of Florida
Walker's Cay
Grand Cay
Strangers Cay
Carter's Cays
Pensacola Cays
Little Abaco I.
Powell Cay
Great Sale Cay
Grand Bahama Island
Cooper's Town
Green Turtle Cay
Great Guana Cay
Man O'War Cay
Hope Town
Tilloo Cay
Marsh Harbour
Little Bahama Bank
Freeport
Mile Rock
Lucaya
High Rock
Moore's I.
Gorda Cay
Abaco Island (2)
Crossing Rocks
Sandy Point
Hole in the Wall
Northwest Providence Channel
Great Isaac
East Isaac
Little Stirrup Cay
Great Harbour Cay
Bimini Islands (4)
Alice Town
Gun Cay
Cat Cays
Ocean Cay
Brown's Cay
Bonds Cay
Chub Cay
Whale Cay
Joulter Cays
Riding Rocks
Morgan's Bluff
Lowe Sound
Nicholls' Town
San Andros
Mastic Point
Stafford Creek
Adelaide
Staniard Creek
Coakley Town
Andros Town
Williams I.
Great Bahama Bank
Berry Is. (1)
Northeast Providence Channel
Royal I.
Current
Spanish Wells
Duncan Town
The Bluff
Alice Town
Eleuthera (5)
Governor's Harbour
North Palmetto Point
Rose I.
New Providence
Tarpum Bay
Rock Sound
Deep Creek
Wemyss Bight
Bannerman Town
Arthur's Town
Bennett's Harbour
Cat Island
Little San Salvador
Shroud Cay
Exuma Cays Land & Sea Park
Smith Bay
New Bight
Old Bight
Port Howe
Hawks Nest Point
Devil's Point
San Salvador (8)
Columbus Monument
Northwest Pt.
Conception I.
Rum Cay
Port Nelson
Great Exuma (7)
George Town
Stella Maris
Little Exuma
Hog Cay
Deadmans Cay
Long Island
Clarence Town
Hard Bargain
Roses
Water Cay
Flamingo Cay
Cape Verde
Jamaica Cay
Seal Cay
Nurse Cay
Raccoon Cay
Ragged I.
Little Ragged I.
Cay Verde
Cay Santo Domingo
Crooked Island Passage
Crooked I.
Colonel Hill
Northeast Point
Landrail Point
Chesters
Pitts Cays
Long Cay
Snug Corner
The Bight of Acklins
Acklins Island
Castle I.
Mira Por Vos
Mayaguana Passage
Abraham's Bay
Mayaguana Island
Caicos Passage
Blue Hills
Providenciales
West Caicos
Northwest Cay
Little Inagua
Ocean Bight
James Hill
North East Pt.
East Hill
Great Inagua Island
Matthew Town
South East Pt.
Turks & Caicos
Nicholas Channel
Archipiélago de Sabana
Cayo Santa María
Old Bahama Channel
Arch. de Camagüey
Guinchos Cay
Channel Rock
Cay Lobos
Cayo Coco
Punta Alegre
Cayo Romano
Cayo Guajaba
Cayo Sabinal
Nuevitas
Cayo Confites
Cayo Caballones
Cayo Anclitas
Cayo Cinco Balas
Pta. Macurijes
Cayo Breton
Golfo de Cayos Ana María
Ana María
Cayo Grande
Jardines de la Reina
Pickle Seamount (31)
Pickle Reef (15)
Cayo Media Luna
Golfo de Guacanayabo
Manzanillo
Campechuela
Niquero
Pilón
Cabo Cruz
Little Cayman
North East Point
Cayman Brac
CAYMAN ISLANDS
United Kingdom
Point
Cayman (36)
Cayman Trench
6740
6257
7888
Bahama Bank
Great Bahama Bank
Tongue of the Ocean
Exuma Sound
Atlantic Ocean
Caribbean Sea
Cuba
Florida
Camagüey
Ciego de Avila
Trinidad
Sancti Spíritus
Fomento
Caibarién
Cruces
Placetas
Cabaiguán
Zaza del Medio
Jatibonico
Tunas de Zaza
Morón
Yaguajay
Camajuaní
Santa Clara
Remedios
Colón
Laguna la Grande
Ciénaga de Zapata
Golfo de Cazones
Golfo de Batabanó
Isla de Pinos
Cayo Largo del Sur
Cayo Largo
Cayo Santa María
Cayo Coco
Cayo Romano
Cayo Guajaba
Cayo Sabinal
Nuevitas
Minas
Florida
Camagüey
Vertientes
Sibanicú
Martí
Guáimaro
Puerto Padre
Manatí
Las Tunas
Victoria de las Tunas
Holguín
Antilla
Gibara
Banes
Los Angeles
Omaja
Jobabo
Contramaestre
Francisco
Santa Cruz del Sur
Jiguaní
Bayamo
Manzanillo
Campechuela
Media Luna
Guisa
Palmarito
Contramaestre
Palma Soriano
San Germán
Cauto
Alto Cedro
Cueto
Mayarí
Moa
Nicaro
Punta Guarico
Sagua de Tánamo
Baracoa
Punta Maisí
Punta Caleta
Guantánamo
San Luis
Caimanera
Sierra Maestra
Pico Turquino
Santiago de Cuba
San Juan Hill
Delgado
Bahía de Guantánamo
UNITED STATES NAVAL STATION
Windward Passage
Canal de la Tortue
Ile de la Tortue
Port-de-Paix
Jean Rabel
Môle St-Nicolas
Bombardopolis
Baie de l'Acul
Gros-Morne
Plaisance
Anse-Rouge
Gonaïves
Citadelle
Fort Liberté
Golfe de la Gonâve
St.-Marc
Arcahaie
Ile de la Gonâve
Pointe Oseille
Anse à Galets
Canal de St.-Marc
Port-au-Prince
Canal du Sud
Léogâne
Pétion
Jérémie
Grande Cayemite
Abricots
Dame-Marie
Anse d'Hainault
Navassa I.
U.S.
Massif de la Hotte
Miragoâne
Goâve
Montego Bay
Green Island
Lucea
Anchovy
Cambridge
Negril
North Negril Point
Discovery Bay
Ocho Rios
Port Maria
Annotto Bay
Antonio
Point

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