

PN-ABM-839

80097

**Agribusiness and Public
Sector Collaboration in
Agricultural Technology
Development and Use in
Ghana:**

**A Study of Postharvest
Technology for Fruits
and Vegetables**

November 1992

AGRICULTURAL MARKETING IMPROVEMENT STRATEGIES PROJECT

Sponsored by the

U.S. Agency for International Development

Prime Contractor: Abt Associates, Inc.
Subcontractors: Postharvest Institute for Perishables, University of Idaho,
Deloitte & Touche, Inc.

**AGRIBUSINESS AND PUBLIC SECTOR COLLABORATION
IN AGRICULTURAL TECHNOLOGY DEVELOPMENT AND USE IN
GHANA: A STUDY OF POSTHARVEST TECHNOLOGY FOR
FRUITS AND VEGETABLES**

**Submitted to
USAID/AFR/ARTS/FARA**

Agricultural Marketing Improvement Strategies Project (AMIS)

**Abt Associates Inc.
4800 Montgomery Lane
Suite 600
Bethesda, MD 20814**

Prepared by:

**Jack Ross
and
Kwabena Owusu-Sekyere**

November 1992

TABLE OF CONTENTS

GLOSSARY	iii
ACKNOWLEDGEMENTS	iv
MAP	vi
EXECUTIVE SUMMARY	vii
INTRODUCTION	xi

PART I: SITUATIONAL ANALYSIS

1. Commodity System	1
1.1 Nature of Commodity	1
1.2 International Market Size	2
1.3 Current Supply	3
1.4 Fruit and Vegetable Market Channels	8
1.5 Marketing Support System	10
2. Demand for Postharvest Technology	12
2.1 Type of Technology	12
2.2 Product Lines	13
2.2.1 Packing Facilities	13
2.2.2 Packing	13
2.2.3 Fruit Processing	16
2.2.4 Airport and Seaport Facilities	17
2.3 Commodity Coverage	18
2.4 Summary of Demand for Technology	18
3. Supply of Technology	21
3.1 Local Research	21
3.2 Local Supply of Products	21
3.3 Import/Export of Technology	24
4. Stewardship	26
5. Collaboration Between Public and Private Sectors	27
6. Economic, Business and Regulatory Environment	28
6.1 Background to the Ghanaian Economy	28
6.2 Macroeconomic Reforms, Market and Price Liberalization	28
6.3 Business Environment	29
6.3.1 Financial Markets	30

6.3.2 Investment Climate	31
6.4 Regulatory Environment	33
6.4.1 Investment	33
6.4.2 Minimum Foreign Equity Capital Investment Requirement	33
6.4.3 Technology Transfer Agreements	34
6.4.4 Imports	34
7. Intellectual Property Rights	35

PART II: ISSUES AND IMPLICATIONS

8. Emerging Issues and Implications for the Future	36
8.1 The Demand for Fruits and Vegetables	36
8.2 Future International Trade	37
8.3 Demand for Technology	38
8.4 Local Technology Development	38
8.5 Supply of Technology	39
8.6 Import-Export of Technology	39
8.7 Collaboration	39

PART III: CONCLUSIONS AND RECOMMENDATIONS

9. Conclusions	41
9.1 Current Situational Analysis	41
9.2 Implications for the Future	42
9.3 Market Opportunity Analysis	45
10. Recommendations	48
10.1 Global Postharvest Information Network	48
10.2 Agricultural Marketing Associations	49
10.3 Export and Agribusiness Training	49
10.4 Support for the Ghana Export Promotion Council	50
10.5 Food Processing Laboratory	50
10.6 Provision of Postharvest Technology	51
10.7 Review of the Collaborative Agribusiness Support Program Report for USAID by Winrock International	51

BIBLIOGRAPHY	52
-------------------------------	-----------

APPENDICES

A. Contacts	A-1
B. Names and Addresses of Key Actors	B-1
C. Ghanaian Business Codes	C-1

GLOSSARY

AID/R&D/AGR	Agency for International Development, Bureau for Research and Development, Office of Agriculture
APEX	ASEAN Food Handling Bureau
ASEAN	Association of South East Asian Nations
BOG	Bank of Ghana
CASP	Collaborative Agribusiness Support Program
CEPS	Ghana Customs, Excise and Preventive Service
COLEACP	Comité de Liaison Europe-Afrique-Caribes-Pacifique pour la Promotion des Fruits Tropicaux et des Légumes de Centre Saison
CPP	Contract Promotion Programs
CRI	Crop Research Institute
CRSP	Collaborative Research Support Program
CSD	Crop Services Department
EEC	European Economic Commission
ERP	Economic Recovery Program
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEPC	Ghana Export Promotion Council
GIC	Ghana Investment Centre
GOG	Government of Ghana
GSEC	Ghana Stock Exchange Company
HAG	Horticultural Association of Ghana

IPR	Intellectual Property Rights
JICA	Japan International Cooperation Agency
LDC	Lesser Developed Country
MOA	Ministry of Agriculture
MTP-NTE	Medium Term Plan, Non-Traditional Export Program
NTHC	National Trust Holding Company
PHDS	Postharvest Documentation Service
PNDCL	Petroleum Exploration and Production Law
STCC	Sales Tax Clearance Certificate
TCC	Tax Clearance Certificate
UNDP	United Nations Development Program
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USDA-ARS	U.S. Department of Agriculture, Agricultural Research Service

ACKNOWLEDGEMENTS

This study of the agribusiness and public sector roles in the postharvest fruit and vegetable handling and processing technology in Ghana was a collaborative field effort between Mr. Jack Ross and Mr. Kwabena Owusu-Sekyere. The authors would like to express deep appreciation to Christine Erbacher of the Agricultural Marketing Improvement Strategies (AMIS) project for her considerable written and editorial contributions to the case study.

Further thanks are offered for the assistance provided by USAID/Accra in the conduct of this study and to the Ghana Export Promotion Council for its contributions and for allowing Mr. Sekyere the leave time to conduct this study.

MAP

IBRD 18395R2



EXECUTIVE SUMMARY

USAID wants to encourage the development and use of postharvest agricultural technology in Sub-Saharan Africa with the assistance of local and U.S. agribusinesses. The goal is to guide Ghana's economy toward a path of sustainable, broad-based, market-oriented growth. USAID would like to promote better collaboration between public and private sectors in postharvest technology development and use. The agency would like to help increase investment by U.S. agribusinesses (for example, joint ventures) in such technology.

This study covers the following areas:

- Fruit and vegetable postharvest technology development by the public and private sector in Ghana.
- Examples of successful collaboration between the public and private sectors in postharvest technology development and transfer.
- Potential for increasing the role of the private sector in fruit and vegetable postharvest technology development in Ghana.

A two-phase study was conducted in Ghana to determine the extent of existing postharvest technology and the potential for developing and enhancing its use. As part of the first phase, a local Ghanaian agricultural economist, who was familiar with agriculture and agricultural exports, contacted public and private groups to determine the current use of postharvest technology. During the second phase, a team reviewed this information and made an in-depth study of the current uses, users, and would-be users of postharvest technology, and of the possibilities of information sharing. The second phase team consisted of the original Ghanaian economist and a professional with extensive private sector experience in postharvest technology.

Initially the emphasis was on pineapple, but the project was expanded to include all pertinent fruits and vegetables of Ghana. The types of organizations that were investigated were producers and/or exporters of fresh and processed fruits and vegetables (primarily pineapple), importers and retailers of postharvest agrichemicals, carton manufacturers, cold storage operators, fruit processors, postharvest researchers, freight forwarders, and public agencies such as the Plant Protection and Regulatory Service of the Ministry of Agriculture, Ministry of Agriculture (Postharvest Unit), the Ghana Standards Board, the Ghana Investments Centre, the Ghana Export Promotion Council, and shipping facilities (harbor and airport).

The types of technology and products investigated included methods of packing fresh pineapples, decay control methods in fresh pineapples, precooling of packed pineapples, types of packaging used for fresh and process fruits and vegetables, methods of transportation, and palletizing. In addition, the following technology-related topics were investigated: efficiencies

of manufacturing cartons that affect costs, quality of packaging, knowledge of allowable chemical residues on fruits, delays in shipping after packing of fruit, quality control of fruit, availability of fruit standards for export fruit, compliance to these standards, ocean shipping schedules, air cargo dependability, availability of chemicals used in postharvest treatment, availability of pilot plant food processing equipment, and instrumentation of laboratories.

During the interviews conducted for this study, it was frequently mentioned that Ghana's public agencies have failed to provide technology due to a lack of resources. For example, the Postharvest Unit of the Ministry of Agriculture is unable to access postharvest technology because it lacks the facilities to carry out research and the support system to perform extension work. Some of Ghana's public agencies have a modest budget and are making some progress. For example, the Ghana Export Promotion Council has hosted seminars and conventions to bring together Ghanaian exporters and European importers of fruits and vegetables.

Ghana has great potential for producing, processing, and marketing tropical fruits and vegetables. Farm land is in good supply, as is water, in most cases; the climate is satisfactory; the people are capable of learning and using new technology; there is a local market and an export market (primarily Europe); ocean transportation to Europe with reefer containers is available to Europe, and air cargo is moderately available. Air cargo will improve by the end of 1992 with the completion of a new air cargo terminal at the Kotoka (Accra) International Airport. This terminal will include a cold storage facility for temporary storage of fruits and vegetables at the airport prior to shipping by air cargo.

Although Ghana has a great potential for the future, much needs to be done before that potential is realized. The basis for producing and marketing fresh pineapple for Europe already is in place. Ghanaian farmers and exporters currently export about 10,000 tons of fresh pineapple annually to Europe. The European market is about 170,000 tons per year for fresh pineapple. Ghana supplies six percent of this market. Ghana's biggest competitor in this market is the Ivory Coast which supplies about 150,000 tons of fresh pineapple annually to Europe. Therefore, the Côte d'Ivoire exports about 15 times more fresh pineapple than Ghana.

On the positive side, Ghana's pineapple industry is using the correct variety, Smooth Cayenne, and is producing fresh pineapple with a satisfactory appearance, taste, and quality for the European market. That is an important start because fresh pineapple, the main suspect of this study, constitutes about 85 percent of Ghana's total fruit and vegetable exports.

Also on the positive side, Ghana has several currently-produced commodities with considerable production, processing, and marketing potential. These are mangoes, eggplants, chilies (both brined and dried), yams, squash, melons, and papayas. Two problems inhibit their development: the current low volume of production and European importers' requirement for volume shipments. A farmer or exporter needs to produce a fairly large volume in order to make enough profit to justify his efforts to develop a new product. Most farmers do not have enough capital to develop a new product and a market for that product. This is a potential role for the Ghana Export Promotion Council, provided it is given a sufficient budget.

On the negative side, much must be done to assist farmers and agribusinesses in the fruit and vegetable industry. The public sector has a reputation for not being able to provide much in the way of postharvest technology. As a general rule, when private sector enterprises want information or assistance in postharvest technology, they get it independently from the public sector. Because of the low capital in the private sector, technology spending is limited. Enterprises obtain technological advances haphazardly, usually by asking friends in Ghana, friends in neighboring countries, or contacts in Europe. As a result, the postharvest technology that is used in Ghana barely satisfies the minimum needs.

Closer collaboration is needed between public and private sectors. A high level of collaboration can be illustrated through an example of how the USDA cooperates with the U.S. private sector in exporting fresh fruits and vegetables to Europe. The shipping capabilities of a commodity or equipment need to be tested, the USDA works with private companies to make shipping tests from the United States to the designated site. Usually the private company supplies the commodity (such as fresh asparagus), a shipping company supplies a reefer container, the USDA provides personnel and instrumentation to supervise the test, and a European importer agrees to complete the test. The test results are available to the public. The result of such a collaborative test is that all the interested parties become well acquainted, they know the possibilities of future shipments, and business relations become established between the producer and the importer. Everybody benefits, and no one group has to absorb all the cost and risk.

There are various public agencies around the world that can provide postharvest technology. These include the Food and Agricultural Organization of the United Nations (FAO), a well-known organization headquartered in Rome, Comité de Liaison Europe-Afrique-Caribes-Pacifique pour la Promotion des Fruits Tropicaux et des Legumes de Centre Saison (COLEACP), the United States Department of Agriculture (USDA), and numerous universities and data banks around the world. Of these, Ghana has immediate access to FAO and COLEACP. COLEACP, an international nonprofit organization headquartered in Brussels and set up in 1973 as part of the European Economic Commission (EEC), covers Europe, Africa, the Caribbean, and the Pacific. Its function is to act as an interface between exporters and European importers who have joined together as members of COLEACP.

A recently completed study about postharvest collaborative agribusiness support, dated March, 1992, considers the possibility of a global collaborative postharvest agribusiness support program and discusses many types and sources of postharvest technology. This study, "A Global Plan for an AID/R&D/AGR Postharvest Collaborative Agribusiness Support Program" was completed by Winrock International for the AID Bureau of Research and Development, Office of Agriculture. Information sources that are perhaps the most applicable to Ghana are the databases for postharvest technology that exist around the world. There is a vast supply of postharvest technology that would be available and useful if the appropriate databases were known and available to Ghana.

Recommendations for potential USAID and GOG assistance in improving the fruit and vegetable postharvest handling and processing (technology development and use) include the following:

- Provide a postharvest technology database,
- Develop agricultural marketing cooperatives or associations,
- Provide training of various kinds in postharvest technology and agribusiness,
- Support the Ghana Export Promotion Council,
- Provide a pilot plant food processing laboratory,
- Assist or lead collaboration by private and public sectors,
- Review the "Collaborative Agribusiness Support Program Report," March, 1992 by Winrock International.

INTRODUCTION

USAID wants to encourage the development and use of postharvest agricultural technology in Sub-Saharan Africa with the assistance of local and U.S. agribusinesses. The goal is to guide Ghana's economy toward a path of sustainable, broad-based, market-oriented growth. USAID would like to promote better collaboration between the public and private sectors in postharvest technology development and use. The agency also would like to help increase investments by U.S. agribusinesses (for example, joint ventures) in postharvest technology.

This study covers the following areas:

- Fruit and vegetable postharvest technology development by the public and private sector in Ghana.
- Examples of successful collaboration between the public and private sectors in postharvest technology development and transfer.
- Potential for increasing the role of the private sector in fruit and vegetable postharvest technology development in Ghana.

Field trips were made to Ghana to identify postharvest organizations, both private and public, that produced or used technology as part of their assigned responsibilities or as a necessary phase in their operations. Initially the emphasis was on pineapple, but the project was expanded to include all pertinent fruits and vegetables of Ghana. The types of organizations that were investigated were producers and/or exporters of fresh and processed fruits and vegetables (primarily pineapple), importers and retailers of postharvest agrichemicals, carton manufacturers, cold storage operators, fruit processors, postharvest researchers, freight forwarders, and public agencies such as the Plant Protection and Regulatory Service of the Ministry of Agriculture (MOA), Ministry of Agriculture (Postharvest Unit), the Ghana Standards Board, and shipping facilities (harbor and airport).

1. Underlying Rationale

The underlying rationale for the technology development system starts with the demand for the commodity, local or worldwide, which induces the demand for (need to develop) the technology necessary to produce the commodity. In turn, this demand for technology induces the supply and the stewardship (supporting services) of the technology. The strategic framework being designed by AID aims to balance the demand for and supply of technology, not at the current level, but at a higher level of technology utilization to bring about sustainable, market-oriented growth of Sub-Saharan Africa's agriculture. To achieve this balance, one must identify and understand the driving forces behind the local and world demand for the commodity; the determinants of, and prospects for, increasing the demand for technology; the generation,

development, testing, and production of technology; and the stewardship of technology needed to facilitate its most effective use.

The second phase field study followed this rationale and further attempted to (a) identify and analyze patterns of collaboration between public and private sectors in the technology development and use; (b) understand how these patterns are determined by the existing business and regulatory environment; (c) suggest appropriate mechanisms of collaboration between public and private sectors in technology development; and (d) determine the appropriate policy instruments (including intellectual property rights) required to make these mechanisms effective.

2. Study Methodology

This study was conducted in two phases. The first phase was done by a local Ghanaian consultant who was familiar with the country, customs, agricultural practices, processing organizations, export practices, and government agencies and policies of Ghana. The first phase provided background data on Ghanaian postharvest technology and businesses. Analysis of this data was used in the second phase to further identify and analyze existing collaboration between public and private sectors in agricultural postharvest technology in Ghana.

During the second phase, an international consultant joined the local Ghanaian who conducted the first phase. The international consultant's background includes fruit and vegetable experience (including pineapple and citrus), postharvest handling work, and private business including production, processing, packaging, cold storage, transportation, and global marketing of fruits and vegetables.

2.1 Phase I Guidelines

The consultant contacted the organizations to be interviewed and explained the purpose of both phases of the project. Information was collected about the organizations connected with technology development and use in Ghana. A questionnaire was used to interview these organizations. The results were used for the second phase to devise a more in-depth analysis of the constraints and opportunities for the private sector to participate and collaborate with the public sector in technology development and use. Some of the key organizations interviewed in the first phase were interviewed again in the second phase.

2.2 Phase II Guidelines

The guidelines for Phase II were developed along seven areas of investigation. Each of the seven areas were expanded into: key components of these areas of investigation, analysis of the current situation, and analysis of implications for the future.

Commodity System

This section is an overview of world and local demand for fruits and vegetables. It describes and analyzes the characteristics of the commodity, its market size, input networks, market channels, and supporting infrastructure and services.

Demand for the Technology

This area of investigation concentrates on the type of technology, its use as complement to or substitute for other inputs in the production or processing of the commodity, its importance in the economy, and eventually, environmental impact.

Supply of Technology

This area of investigation concentrates on research efforts and commercial production of the technology products by private and public organizations; how national research systems are organized to generate, test, and produce technology; and participation by the private sector in technology research and production.

Stewardship of Technology Products

Stewardship concerns supporting services that promote and distribute technology products to users. These services include extension, information, training, financing, and distribution efforts. This section discusses how public and private institutions handle stewardship of technology products as well as efficiency gains by privatized distribution networks in technology development and use.

Public/Private Collaboration

This section summarizes and expands the information gathered in analyzing the supply and stewardship of technology by private and public organizations. Public and private sectors may collaborate in conducting/financing technology development and in the stewardship of technology products through different mechanisms. This section also examines the public sector's contribution to supporting the private sector in its technology development efforts.

Economic, Business, and Regulatory Environment

This environment affects the demand for, and supply of, the commodity and the technology. Key elements of this environment are identified in this section. These include macroeconomic reforms, market and price liberalization, business environment, and regulatory measures. Relationships between technology development and regulatory measures are considered.

Intellectual Property Rights

Intellectual Property Rights (IPRs) can affect technology development and use. They are considered because they may strongly affect the participation of private organizations, particularly foreign enterprises, in technology research and development.

3. Emerging Issues and Implications for the Future

In extending the situational analysis, this section identifies alternative mechanisms for collaboration and regulatory measures to improve the development and use of technology. It also attempts to forecast the changes that would result if specific measures were introduced, for example, in the regulatory environment.

4. Conclusions and Recommendations

Conclusions

This section presents conclusions regarding the current situational analysis and the implications for the future. It also presents a market opportunity analysis and a strategy for increasing Ghana's world wide fruit and vegetable market share.

Recommendations

The recommendations identify potential roles for USAID & the Government of Ghana (GOG) in promoting private sector technology development and use in postharvest handling and processing of produce.

1. COMMODITY SYSTEM

The Government of Ghana (GOG), including the Ministry of Agriculture (MOA), is putting considerable emphasis on increasing the export of nontraditional crops. Because of the profitability of exporting fruits and vegetables, especially pineapple, the GOG has established a medium-range plan. The first phase of this plan covered the period from 1988-1990. The current phase of the plan, called the Medium Term Plan, Non-Traditional Export Development (MTP-NTE), covers the period from 1991-1995.

1.1 Nature of Commodity

Although Ghana has great potential for producing fruits and vegetables, present production is very low in terms of the volume that is necessary to have a strong export program. Customer satisfaction, whether in Europe, United States, or elsewhere, is probably the most compelling requirement that exportable fruits and vegetables must meet. Customers typically must be satisfied with the quality, quantity, price, delivery dates, packaging, and dependability. If a farmer or producer has only a limited supply base of the product for the export market, it is extremely difficult to meet all the requirements of importers abroad, especially product quality.

All the other requirements can be equally difficult to meet. Ghanaian farmers or producers will probably find it necessary to pool their resources to form a larger supply base prior to expanding their export market. A typical way to expand the supply base is for farmers to join together in a cooperative marketing association or a cartel whose sole purpose is to market the fruits and vegetables of its members. By doing this, farmers can then derive benefits from the profits generated from both the production and marketing phases while, at the same time, improving their capabilities of fulfilling quality and other requirements of importers and customers abroad. In addition, they can present a broader base for obtaining postharvest technology to further increase their profits.

PINEAPPLE STANDARDS (Ananas comosus)

Variety: Smooth Cayenne
Grade: U.S. Fancy, No. 1, and No. 2.
Harvest state: Will not continue to ripen after harvest.
Treatments: Fungicide to reduce decay.
Precooling: Forced, room cool.
Temperature: 7° to 13° C (45-55° F),
Sensitivity: Chilling injury below 7° C (45° F).
Transit & Storage Life: 2 to 4 weeks.
Availability: Year round -- Hawaii, Puerto Rico, Mexico, Dominican Republic, Honduras, Costa Rico, Philippines, Thailand, Columbia, Ivory Coast, Ghana, Kenya, Australia.

Box 1

In Ghana, the horticultural crop with the greatest international market demand at the current time is pineapples. Producing, handling,

and processing pineapples for export markets requires careful attention to standards and handling practices. A summary of some of the handling requirements is shown in Box 1.

1.2 International Market Size

The Food and Agriculture Organization (FAO) of the United Nations keeps records of the estimated annual production of the major horticultural crops in the world. The total world production of fruits and vegetables is 1,400 million metric tons annually. Developing countries alone produce 600 million metric tons annually (see Exhibit 1).

Exhibit 1

Estimated Production of Major Horticultural Crops*

(Millions of Metric Tons)

<u>World Production</u>	<u>1984</u>	<u>1989</u>
Root Crops	594	590
Vegetables and Melons	396	434
Fruits	314	336
<u>Developed Market Economy Production</u>		
Root Crops	79	76
Vegetables and Melons	102	106
Fruits	99	101
<u>Developing Country Market Economy Production</u>		
Root Crops	213	230
Vegetables and Melons	141	155
Fruits	169	184

Source: FAO. 1990 Production Yearbook, Vol. 43, 1991.

* Values do not include noncommercial (subsistence) production. Therefore, taking into account home-grown crops, actual production values are substantially higher than those presented.

According to FAO records, the annual production of major horticultural crops, primarily fruits and vegetables, in Ghana is on the order of 1.5 million metric tons. For the export

market, pineapples made up the largest volume of the fruits and vegetables. No records were kept of local consumption, so the actual production figures are estimates.

Europe is the primary export market for Ghana. In 1987, pineapple imports from all sources into Europe totalled 199,213 tons, of which 2,709 tons were imported from Ghana (COLEACP, 1991. See Exhibit 2 and 3). Ghana's total pineapple exports that year amounted to 4,125 tons (See Exhibit 4). By 1991, Ghana's pineapple exports were 10,674 tons, valued at US \$5,065,000. This represents a significant increase for Ghana and would have made up about 5 percent of the total imports of pineapple into Europe if all Ghana's pineapple exports had gone to Europe. Pineapple represents about 60 percent of Ghanaian fruit and vegetable exports. (See Exhibit 4 and Box 2 for further discussion).

The market for fresh pineapple in Europe is highly competitive. Côte d'Ivoire is the principal supplier of African pineapple to this market. Côte d'Ivoire's pineapple is transported by sea-freight in reefer containers and, therefore, has a lower delivery price than Ghana's pineapple, which is exported primarily by air freight. In 1990, Côte d'Ivoire exported 141,104 tons to Europe compared to Ghana's 6,060 tons (Exhibit 2).

1.3 Current Supply

A short discussion of production constraints for fruits and vegetables in Ghana will help explain comments about postharvest handling technology. Production practices affect postharvest considerations and, therefore, cannot be ignored. The production or supply base of all fruits and vegetables in Ghana is weak in terms of exportable quantity and quality. By local Ghanaian standards,

pineapple is a major crop and the major contender for export to the European market. However, other countries, such as Costa Rica, Dominican Republic, and the Côte d'Ivoire, already produce and export considerable quantities of good quality Smooth Cayenne variety fresh pineapple to the European market. To export to Europe, Ghana must compete with these producers.

Pineapple exports increased so dramatically over a five year period (Exhibit 2) because of widely available planting material. At the start of the expansion period, many smallholders were growing pineapple for the local market. The existing varieties were Red Spanish, Queen, and Smooth Cayenne. When exports started to expand, there was enough Smooth Cayenne to use in export and still satisfy the local market. By exporting fruit that normally would have gone to the local market, the smallholders were able to expand the export market for a short time. That expansion rate is no longer possible. Limited additional available planting material for Smooth Cayenne has reduced the potential growth rates for pineapple exports from those rates experienced the first few years.

Apparently, the initial high growth rates in export volume were possible because the exporters made contact with European importers and made an increased effort to export pineapple. Adequate supply of exportable fruits was available for only a few years. Expansion of pineapple by vegetative propagation (suckers), the stage Ghana is presently in, is a slow process. The method generally used by farmers in other geographic areas has been to buy planting material (crowns and slips mostly, some suckers) from growers in other countries. Considerable capital is required to accomplish this task.

Box 2

EXHIBIT 2

E.E.C. SOURCES OF PINEAPPLE SUPPLY (metric tons)

YEARS	1986	1987	1988	1989	1990
Côte d'Ivoire	165,158	171,151	145,425	132,332	141,104
Costa Rica	1,877	12,107	23,115	26,642	28,349
Honduras	-	60	3,886	7,169	19,447
Ghana	1,956	2,709	3,264	4,604	6,060
Dominican Rep.	194	1,088	1,185	2,216	3,781
Guinea	166	381	852	1,091	1,648
So. Africa	1,622	1,315	1,808	1,490	1,479
Fr. Guiana	-	98	132	559	809
Cameroon	2,778	1,947	820	725	606
Thailand	558	805	978	991	566
Brazil	462	1,176	1,657	1,191	348
Kenya	311	292	16,326	2,530	216
Togo	420	237	312	251	197
Namibia	-	-	-	-	190
Uganda	694	648	448	553	166
Nigeria	75	278	151	208	125
Martinique	499	243	164	173	80
Colombia	252	150	61	109	49
Phillipines	14	2,657	290	207	39
U.S.A.	6	890	971	158	15
Taiwan	278	138	48	11	2
TOTAL Extra - E.E.C.	178,152	199,213	201,835	184,037	206,393
A.C.P.	171,703	177,848	167,747	142,507	154,290

SOURCE: COLEACP; "Imports of Tropical and Off-Season Fruit and Vegetables in the EEC from 1986 to 1990" at the Tenth ACP/EEC Trade Conference, Accra, 1991.

EXHIBIT 3

DEVELOPMENT OF E.E.C. IMPORTS OF PINEAPPLES OVER 5 YEARS (metric tons)

YEARS	1986	1987	1988	1989	1990
France	65,791	62,676	73,125	66,608	78,805
Belgium/Luxembourg	13,325	27,306	28,454	32,264	48,798
West Germany	26,914	29,440	29,621	27,985	25,170
Spain	13,773	17,223	19,605	19,248	19,839
United Kingdom	17,487	19,129	20,869	17,909	16,173
Netherlands	17,529	15,984	11,149	9,815	9,152
Italy	21,389	24,632	16,224	7,712	6,191
Denmark	1,744	2,712	2,296	2,012	1,938
Ireland	56	192	149	293	240
Greece	144	278	322	191	71
Portugal	-	1	21	-	16
Extra-E.E.C.	178,152	199,213	201,835	184,037	206,393
A.C.P. Countries	171,703	177,848	167,747	142,507	154,290

SOURCE: COLEACP; "Imports of Tropical and Off-Season Fruit and Vegetables in the EEC from 1986 to 1990" at the Tenth ACP/EEC Trade Conference, Accra, 1991.

EXHIBIT 4

EXPORT PERFORMANCE OF HORTICULTURAL PRODUCTS (FRUITS & VEGETABLES)
FROM THE NONTRADITIONAL EXPORT SECTOR (1987 - 1991)

Value: (1,000 U.S. dollars), Quantity: Tons

PRODUCT	1987		1988		1989		1990		1991	
	QTY	VALUE								
Agricultural Products - Totals:	18,800		27,059		21,169		28,781		33,929	
Horticultural Products - Totals:	4,768	1,042	5,748	1,628	9,703	2,527	12,139	4,936	15,274	8,385
Fresh Pineapples - Totals:	4,125	900	4,906	1,408	7,946	2,096	9,440	3,829	10,674	5,065
Other Agricultural Products - Totals:	643	143	842	220	1,759	431	2,699	1,107	4,600	3,320

Source: Ghana Export Promotion Council, Accra, Ghana.

The production constraints faced by Ghanaian farmers can be summarized as follows¹:

- Shortage of planting material for the Smooth Cayenne variety of pineapple
- Inappropriate farm management practices
- Lack of irrigation facilities
- Poor organization, procurement and applications of inputs and agrichemicals for growing pineapples
- Inadequate extension services for all fruits and vegetables
- Lack of research base for production of all fruits and vegetables
- Limited access to credit facilities in support of production

Fruits and vegetables are an important part of the diet for people in all parts of the world. They are consumed in both fresh and processed form. Processing can include canning, freezing, brining, drying, and juicing as normal methods of preservation. For Ghana, the main export commodity to be considered in this study is pineapple. The main variety of pineapple to be considered for both fresh and processed export markets is Smooth Cayenne because it is by far the leading variety on the world market. In addition to pineapples, Ghana produces mangoes, papayas (paw-paws), oranges, limes, avocados, yams, tomatoes, eggplants, okra, cashew nuts, and chilies. For the fresh export market, pineapples are the only commodity of any importance. Mangoes are exported but only in very small quantities. Juice is the only product made from processing of pineapples, oranges, and limes. The juices produced are all hot pack single strength juices that are consumed locally. No canned or frozen fruits or vegetables were produced in Ghana at the time this study was undertaken.

Vegetables in Ghana are grown mainly for domestic consumption. Plantings are small and vary from small backyard plots to more organized plantings of about one acre. Yields and quality are low. Production periods normally are from April through July, and from September through October. The export of vegetables has been negligible in the past and has accounted for less than one percent of all exported horticultural products between 1986 and 1990. In 1989, the Ghana Export Promotion Council (GEPC), with assistance in the form of a grant from the Norwegian Government, started a program to increase vegetable exports. Six companies selected by GEPC were offered exporting assistance. This assistance consisted of good seed material, packaging materials, technical advice, and market assistance. Export under this assistance program began in November 1990, and by the end of the year, a total of 25.5 tons had been exported. In 1990, this export volume contributed to the highest-ever export volume of vegetables, a total of 48 tons, worth \$40,293. The vegetables included okra, chilies, squash, eggplants, and melons (of the 'ney-dew type). Further production and marketing assistance is being provided to enable the selected farms to get a firmer hold on the European market.

¹Taken in part from the Medium Term Plan - Non-Traditional Export Promotion (MTP-NTE), 1991-1995, Ghana Export Promotion Council, 1991.

1.4 Fruit and Vegetable Market Channels

Participants and facilitating services in a typical commodity system for handling fruits and vegetables are diagrammed in Exhibit 5. The commodity system in Ghana has many of the participants and services shown in the diagram. The main differences are that Ghana is not quite as sophisticated, and the bigger farmers have become exporters as well as producers. Because pineapple is the main export crop, it will be used often to demonstrate the functioning of the commodity system.

The current local marketing system in Ghana is typical of developing countries. The farmer (including family members of both sexes) sells fresh fruits and vegetables in the local outdoor market. These markets are well organized as to place and time. Roadside stands are also used for marketing. In some cases, a wholesaler will buy from the farmer and transport the commodities in lorries to a central rural market or to a larger central market in the cities where they are sold to consumers.

Exporting is usually done directly by farmers (called farmer-exporters) without going through a wholesaler. Typically, when a farmer decides to export, he makes initial contact with an importer in Europe. The farmer uses his production (usually pineapple) as the nucleus and gets other farmers to assign their production to him to raise quantity to a sufficient level for export. Sometimes, the lead farmer forms a cartel with written rules relating to production, harvesting, color of fruit, and quality control. These rules further describe grading and packing, carton size, quality checks for the packaged fruit, and methods of marking the cartons.

The farmer-exporter arranges for the air or sea transportation. Every part of the system is significant, but perhaps the most important is getting money back from the importer in Europe. Usually there is no established procedure for paying individual growers. Some farmers require partial payment from the importer within 48 hours of arrival in Europe, followed later by a final payment. Inadequate knowledge of procedures related to exports, coupled with individualistic approaches to export marketing, results in a high incidence of non-payment on the part of the importers. All of the above indicate that well-organized marketing cooperatives, with specific bylaws or rules of operation, would be beneficial to small farmers who wish to export. There are about 30 active farmer-exporters who could serve as a nucleus for marketing cooperatives (see Exhibit 6).

By Ghanaian standards, the exporters are fairly sophisticated. However, more exporters are needed to effectively aggregate the production of small farmers, provide a larger supply base, and assure the farmer's equitable returns. In this study, no evidence was found of large cooperatives organized to manage exports.

Farmers-exporters face great financial constraints in developing their enterprise. Ghana does not have an export credit guarantee scheme. Access to working capital and term finance is poor. The exporters are not allowed to borrow off-shore for capital expenditure in Ghana. Retentions of earnings tie up much-needed finance necessary to expand exports.

EXHIBIT 5

A COMMODITY SYSTEMS ASSESSMENT METHODOLOGY

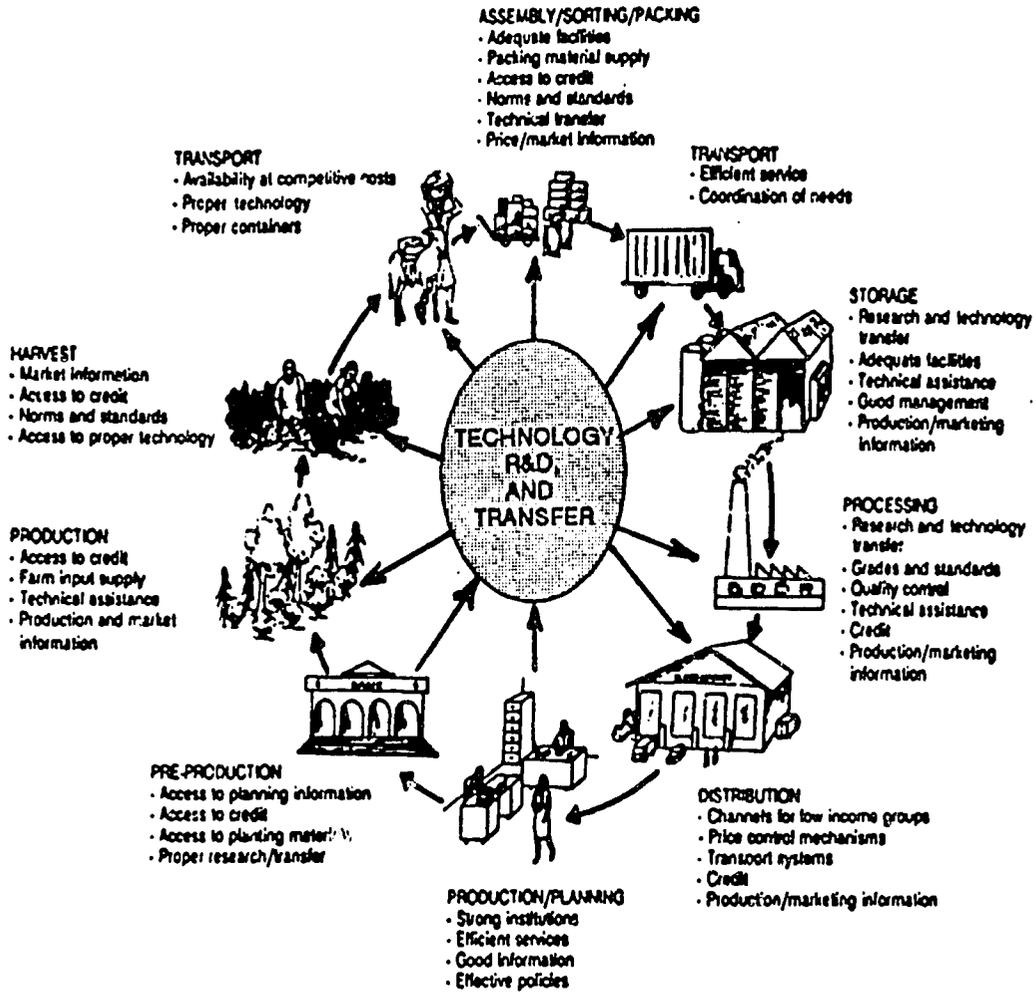


EXHIBIT 6

GHANAIAN FARMER-EXPORTERS

Adicopa Farms Ltd.	G. Brands Impex Ltd.	Mashaco Est.
Afarco Farms Ltd.	Gemare Gh. Ltd.	MFO Farms Ltd.
Akramang Farms Ltd.	Gabrho Farms Ltd.	Nicap Farms Ltd.
Ama Konama Export	George Fields Farms Ltd.	Paradise Farms Ltd.
Burt & Barker Farms Ltd.	Gracittah Enterprise	Seiwah Consolidated Farms
Combined Farmers Ltd.	Greenspan Farms Ltd.	Tropiculture Farms Ltd.
Danakot Farms Ltd.	Greentex Farms Ltd.	Uche Farms Ltd.
Doswak Farms Ltd.	John Lawrence Farms Ltd.	Ukays Tropical Products Ltd.
Fako Farms Ltd.	Koranco Farms Ltd.	Worsteb Farms Ltd.
Farmex Ltd.	Larome Farms Ltd.	Zako Farms Ltd.

1.5 Marketing Support System

There is no public support structure for local marketing of fruits and vegetables other than making land available for local markets. Private entrepreneurs receive no support or aid in their efforts. For export marketing, there is some public assistance. For example, the role of Ghana Investments Centre (GIC) is to bring in investors. However, the organization is rarely successful. The most direct contact between entrepreneurship and a public entity occurs when the Plant Protection and Regulation Service issues phytosanitary certificates for export shipments. Importers in Europe are required to show these certificates to prove that incoming fresh agricultural products are free of unwanted diseases and pests. The Ghana Export Promotion Council works with exporters to find customers and encourage exports.² Other existing export support structures include air cargo, sea cargo, roads, freight forwarders, and other agencies common to the business world.

On the processing end, the absence of processing and canning facilities is also a major impediment to increasing the supply and market share of pineapples and other products. Currently, there are only two companies canning fruit juices for export. Alternative markets for excess horticultural products that are not sold in the fresh export markets are necessary to promote growth in production and export.

Upgrading Ghana's transport infrastructure has become a priority area for the government. Ghana's road networks in production areas are poor and improvement could result in better quality produce for export. Port infrastructure facilities are currently being developed

²According to an independent reviewer, the Ghana Export Promotion Council lends little aid to aspiring exporters.

in Ghana. In general, the lack of cold storage facilities for perishables at ports has been a constraint, causing reliance on the much more costly and scarce air freight method. At Tema Port in March, 1991, port facilities for sea-freighting of horticulture exports were organized for the first time. While electricity for refrigerated containers has now been provided, Tema still needs a packing shed to provide shelter from the sun and rain for loading reefer containers.³

The transport problem is mainly the result of the relatively low volume of pineapples, and other fruits and vegetables, generated by Ghana. Since a higher volume is necessary to attract shipping lines that will run regular, direct services to key European destinations, Ghanaian exporters are forced to buy space on vessels that go up and down the West African coast and at a number of European ports.

³"Ghana Medium Term Plan - Non-Traditional Exports," 1991.

2. DEMAND FOR POSTHARVEST TECHNOLOGY

2.1 Type of Technology

As applied to this project, postharvest technologies are technical methods or processes for moving fruits and vegetables through the commodity system, from harvesting to marketing. These methods or processes include products and equipment, support services, and management systems applied to solving problems and carrying out activities. Technology may be mechanical, chemical, biological, managerial, or processing technologies.

There is a demand for all of the different types of postharvest technologies listed above. This includes materials handling from the field to a central gathering point, processing of all kinds, packaging, cold storage, quality control and certification, transporting to market, market information, wholesale marketing, and finance. Other postharvest technologies that would benefit farmers include an improved agribusiness environment (including government policies), elimination of unnecessary exporting paperwork, improvement of plant quarantine regulation or assistance, and the provision of raw materials such as fertilizer and chemicals.

Typical types of postharvest technologies that were investigated by the consultants included the following processes and services:

- Methods of packing fresh pineapples
- Decay control methods in fresh pineapples
- Precooling of packed pineapples
- Types of packaging used for fresh and processed fruits and vegetables
- Modes of transportation
- Use or nonuse of palletizing
- Cost efficiencies of manufacturing cartons that affect costs
- Quality of packaging
- Knowledge of allowable chemical residues on fruits
- Delays in shipping after fruit is packed
- Quality control of fruit
- Knowledge of and compliance with fruit standards for export fruit
- Convenience of ocean shipping schedules
- Dependability of air cargo
- Availability of chemicals used in postharvest treatment
- Availability of pilot plant food processing equipment
- Availability of laboratory instrumentation

All the postharvest handling information for pineapple has originated overseas. The biggest unsolved problem with fresh pineapple is the endogenous brown spot. This is an internal darkening and browning of the pineapple flesh, which occurs about a week after harvest. It is an important problem in Ghana and has a bearing on whether or not Ghana can compete in the

European market. Methods involving specific farming cultural practices and postharvest handling procedures have been developed to reduce and (perhaps eliminate) this problem. However, Ghana does not have these technologies. This information provides a good example of technology that is available and potentially useful to Ghana's pineapple farmers and exporters.⁴

The three-color printing of boxes is another example of a technique that is readily available but not currently utilized in Ghana. As a result, Ghanaian exporters are at a marketing disadvantage because they have a less attractive box than their competitors.

2.2 Product Lines

Present product lines are inadequate. Following is an inventory of the major technology which is available for postharvest handling and processing in Ghana.

2.2.1 Packing Facilities

There are no modern packing facilities for fresh fruits and vegetables. The absence of standard packing facilities has remained a limiting factor in the attainment of optimum quality standards for exportable fruits and vegetables at the enterprise level. On most of the farms, fruit packing is done in the field under small huts, under trees, or in the open. The lack of packing facilities is a major cause of produce deterioration and poor quality.

Sorting for size and color is often conducted without an organized process, resulting in multiple handling of the fruit and quality deterioration.

The establishment of proper packing facilities is not necessarily expensive. Local materials (thatched sheds and stores) may be used. The use of grading facilities such as automatic grading machines may also help in preserving the quality of fresh fruits.

2.2.2 Packaging

There are three carton-manufacturing plants producing in Ghana, all of which need considerable modernizing to produce satisfactory cartons. Of the three carton manufacturing plants, the oldest one is owned by the government. The other two are recently established and privately-owned facilities (Exhibit 7). Together they produced 7.4 million cartons and 3,167 tons of paper products in 1991. The total number of cartons used by 14 companies in 1991 was 1.45 million (Exhibit 8).

A common observation is that all three plants lack the necessary facilities to test the quality of raw materials and finished cartons (compression tests, bursting, etc). Such facilities

⁴This information is available from Mr. Dave Anderson, Anderson Associates International, P.O. Box 2442, Bakersfield, CA 93303, FAX: (805) 872-7855.

are, however, essential. The poor strength of paper cartons produced by these plants render them unsuitable for exports by sea, often collapsing when subjected to the least amount of stress. This problem has previously led to the rejection of exported fruits at their final destination, resulting in great financial losses to exporters. To further compound the problem, only one plant has a corrugator, and none have the capability to produce a glued manufacturers joint, a feature that is necessary to meet the European laws for recycling cartons. Also, none have the capability to print in three colors, which means the graphics on the cartons are inferior to those provided by other exporting countries.

EXHIBIT 7

STATISTICS ON THE PRODUCTION OF CARTONS IN GHANA (1987 - 1991)

ENTERPRISE	1987	1988	1989	1990	1991	TOTAL
1. Paper Conversion Company	2,423 tons	2,562 tons	2,470 tons	2,585 tons	3,167 tons	13,217 tons
2. Packrite Cartons and Packaging Industries Limited	-	-	316,763	1,054,798	1,213,628	2,585,189
3. Ghana Cartons Boxes Manufacturing Company	-	-	289,011	907,363	1,152,360	2,248,734

EXHIBIT 8

STATISTICS ON THE USE OF FRUIT POSTHARVEST TECHNOLOGY PRODUCTS
(CARTONS) IN GHANA (1987 - 1991)

ENTERPRISE LEVEL	1987	1988	1989	1990	1991	TOTAL
Akramang Farms Unlimited	35,000	25,620	50,635	60,572	75,240	212,067
Farmex Limited	70,000	59,710	81,605	107,730	118,940	437,985
Greentex Limited	6,700	20,090	53,865	56,525	77,425	207,905
Koranko Limited	17,780	56,770	129,295	148,580	152,256	504,468
MiFO Farms Limited	-	-	-	5,700	6,555	12,255
Adicopa Farms Limited	1,680	15,680	32,623	50,312	60,325	160,620
Laromme Farms Limited	-	2,100	285	902	855	4,142
John Lawrence Farms Ltd.	7,406	8,890	17,860	29,355	44,422	107,933
Nikap Farms	-	448	2,945	1,235	6,175	10,803
Zako Farms	1,890	315	8,550	43,671	61,655	116,081
Danakot Farms Limited	2,030	7,490	9,775	15,827	9,690	44,812
Keb Farms Limited	-	2,800	7,133	1,235	-	4,320
Doswak Limited	5,460	8,120	665	15,190	1,406	37,309
R. Addotey Agencies	-	1,169	-	-	190	2,024
NATIONAL LEVEL	333,760	402,360	921,861	1,153,205	1,451,106	4,262,292

The carton manufacturing plants need financial support to bring in more efficient and modern equipment and to enable them to import and stock raw materials, especially during the periods when the dollar/cedi exchange rate is low. One of the privately owned plants, Packrite Cartons and Packaging Industries, has secured a World Bank loan to bring in new equipment by the end of 1992.

The normal terms of sale of cartons to exporters require exporters to make forward payment for their orders. This system has created problems for both exporters and carton manufacturers, especially as exporters often face liquidity problems. The system of credit sales to exporters has been abused by exporters in the past. One possible solution to this stalemate is to institute a financial buffer system to meet the needs of both exporters and carton manufacturers.

In the past, there has been no effective mechanism to relay feedback to the manufacturers on the state or condition of cartons at their ultimate destination. Such a mechanism should be instituted immediately. Of equal importance is the need to expose these manufacturers to the external fruit market to enable them to see first hand modern standard packaging requirements and trends.

2.2.3 Fruit Processing

Three fruit processing companies were interviewed during the conduct of this study. Two were juice-processing plants. The government-owned GIHOC Cannery Company Limited outdated and inefficient. The company is currently scheduled for divestment from government control. Astek Fruit Processing Limited and Nkulenu are privately owned (Exhibit 9).

GIHOC Cannery Company Limited: Built by the Yugoslavs in 1960 with an installed capacity of 12,000 tons per annum, GIHOC is now producing at 15% of capacity due to broken down machinery which has not been replaced since installation. Total cans of production between 1982 and April 1992 were 1.3 million. While there is an urgent need to rehabilitate the existing plant, all efforts at rehabilitation of the machines have failed. The cost of successful plant rehabilitation was estimated at US 2.6 million in 1988.

GIHOC Cannery has production lines for juice, slices, pieces, crushed pineapple, and jam. Presently, the company is not producing slices and pieces and is not in a position to meet either the local or external demand for its products.

Astek Fruit Processing Limited: Astek was established in the early 1980s and is in reasonable condition. It is undergoing modernization to enable it to pack in TetraPak packaging by the end of 1992. It produces fruit juices as its sole products.

EXHIBIT 9

**STATISTICS ON THE USE OF FRUIT POSTHARVEST TECHNOLOGY PRODUCTS
AT ENTERPRISE LEVEL - (1982 - APRIL, 1992)**

ENTERPRISE	CARTONS	CANS	PROCESSING EQUIPMENT	REEFER CONTAINERS	OTHER
1. Gihoc Cannery Limited	55,000	1,320,000	3	-	-
2. Nkulenu Industries	10,000	240,000	3	-	-
3. Delmas Ghana Limited	-	-	-	117	-

The major difficulty facing Astek is access to adequate packaging materials (bottles, cans, plastic containers) for the final product. This difficulty has had a significant effect on its production expansion programme.

Nkulenu Industries: In existence for over 40 years, Nkulenu is a small scale processor with good management but lacking the necessary financial support for expansion. It produces orange squash, lime juice, orange marmalade, pineapple jam, and canned palm nut soup. The company has produced 240,000 cans of product since 1982. The existing machines are fairly old and have limited capacity. The company is in dire need of more modern and efficient processing equipment.

2.2.4 Airport and Seaport Facilities

Fresh produce is palletized or loaded into containers in the open. There are no cold storage facilities available for fresh fruit and vegetables other than refrigerated vans owned by three companies and reefer containers used for shipping by sea. At the airport, pallets may stand in the sun for hours; sometimes overnight, often resulting in over-heating of produce both before loading and while in the aircraft. Facilities for handling fresh produce at the airport should include sheds for palletizing and inspection, cold stores, pallet scales, offices for quality control inspectors, and mechanical equipment for transferring pallets onto the aircraft.

The Ghana Civil Aviation Authority at Accra International Airport is planning a cold storage facility at the Accra airport, to be completed and in use by December, 1992. This facility is intended to serve both importers and exporters. In order to protect the interests of the exporters, who would be competing for limited cold storage facility space (30 x 30 meters),

separate pre-cooling and cold storage facilities should be provided for export use only. According to the Aviation Authority, sufficient expansion space is available, providing funding is secured.

At the port, the Ghana Ports and Harbours Authority has provided 24 plug-in points for reefer containers as part of a port rehabilitation program financed by the World Bank. It appears, however, that these reefer points have been monopolized by frozen meat/fish importers, leaving virtually no space for fresh produce exporters.

As a partial solution to this problem, Mssrs. Demas (Ghana) Limited has provided reefer points and containers in its yard at the Tema Port to serve small-scale fresh produce exporters who do not have adequate resources to acquire containers. (See Exhibit 9 and Box 1 for further discussion).

2.3 Commodity Coverage

Pineapples are presently the most important export commodity in Ghana. They make up about 85 percent of the total volume of fruits and vegetables produced in Ghana. Of lesser importance are oranges, limes, mangoes, tomatoes, eggplants, chilies, squash, melons, and okra, which are grown in Ghana.

2.4 Summary of Demand for Technology

While it is very difficult to quote specific figures regarding the existing demand for postharvest technology in Ghana, there is a significant unmet domestic demand for pineapple. Investigations conducted by the Ghana Export Promotion Council over the past five years show that annual pineapple exports from Ghana constitute about 7% of total production for each year. For example, in 1991, 141,426 tons (152,485.7 tons minus 10,674 tons) of fresh pineapple were supplied to the local market. According to the GEPC, this volume of pineapple supply outstrips local demand which derives from fresh fruit consumption and processing into fruit juice. This scenario emphasizes the need for preservation by way of cold storage and processing. Hence, there is a need for more postharvest handling and processing technology.

Another supporting statistic is the phenomenal rise in fresh pineapple exports over the last five years, with potential for more market growth. The constricting factor is the available technology, such as agrichemicals, cartons, and cold storage facilities, which are essential inputs for meeting export market quality standards and specifications, which is needed to service the demand. Farmers and agribusinesses need and want much more than is currently available to them. Technology that is available is adopted very quickly. If technology is not available, the persons needing it will do whatever is necessary to get it. Usually this means asking friends for help within Ghana, in other countries in Africa, or (most likely) private businesses in Europe. Occasionally, but rarely, a foreign university is contacted. Seldom is a Ghanaian public organization contacted because the general feeling in the private sector is that the government organizations have nothing to offer.

It may be useful to show how postharvest technology can affect the agribusiness relations between producer and customer. When working with fresh fruit and vegetables, usable life of the commodity is very important. Good quality and good prices are synonymous. A commodity with a long usable life, known in the trade as shelf life, is very desirable because it gives the sellers and buyers more time to make their transactions.

There are four commonly used ways to extend shelf life of fresh fruits and vegetables:

1. Store the commodities at low temperatures.
2. Store the commodities at high relative humidity
3. Coat the commodities with chemicals that inhibit decay by reducing the growth of fungi.
4. Coat the commodities with wax to prevent loss of internal moisture.

Shelf life is extended to the maximum if all these are used simultaneously. The cold storage rooms, the most common method of low-temperature storage, use electricity for power, are relatively expensive, and must be used continuously to be cost efficient. This is another situation in which a large organization such as a cooperative is more likely to provide postharvest facilities than a small farmer-exporter.

Ghana does not have any cold storage rooms for fresh fruits and vegetables. One is under construction at the airport cargo terminal scheduled for completion by the end of 1992. That will be satisfactory for air shipments of fresh pineapple, but not for sea shipments by reefer containers. For sea shipments, the reefer containers are used both for pre-cooling and for longer term storage, which includes the time en-route to Europe. The best system is to use a precooler and a cold storage room at the packing facility, and then load the fully cooled commodity directly into the reefer container at the packing facility. Ghana needs to provide the money and the expertise from abroad to construct the facility.

The use of high (ninety percent) relative humidity in combination with low temperatures is helpful in maintaining quality and extending shelf life because it reduces the loss of internal moisture of the commodity. The capability for relative humidity usually is included in modern cold storage rooms.

Chemicals that inhibit the growth of fungi are widely used to control decay in fresh fruits and vegetables. For pineapples, benomyl is commonly used but is often not available because of lack of demand. The farmer-exporter must make a special order months in advance through an importer in Ghana or a chemical company abroad. Because this increases the cost and requires extra work and planning, it is sometimes omitted. Most countries that import fruits and vegetables have specific allowable chemical tolerances. These are periodically checked at ports of debarkation. Ghana exporters do not have the capability of checking chemical residue because of a lack of the necessary instruments, gas chromatographs, which creates an additional incentive not to use the chemical.

Wax coatings are helpful in reducing the loss of internal moisture in fresh fruits and vegetables. Wax usually is mixed with the decay control chemical and applied at the same time. It is not expensive but requires some additional funds as well as extra attention to get the correct kind of wax. For air cargo shipments of pineapple, wax and decay control chemicals are not crucial. The trip to Europe by sea is about two weeks longer than by air, so wax and decay control chemicals are important in helping extend the shelf life. Wax is available by special orders from chemical companies in Europe or the United States. Representatives from the Atochem Company in Paris, France, which specializes in wax coatings for fruits and vegetables, stated that they have no interest in Ghana because of the low volume. Although exporters in Ghana claimed they have brought in wax and used it, none could be found during the period of this report.

If Ghana is going to substantially increase the sea shipments, obtaining the maximum shelf life and quality should have a high priority. The European importers are well versed in this subject. They are well acquainted with specific procedures used by exporters from whom they buy. Therefore, it is to be expected that they will know what procedures the Ghanaian exporters are using to extend the shelf life of their commodities.

The end result is that the private sector is forced to acquire its own postharvest technology in rather haphazard uncoordinated ways. The results tend to be minimal and usually are just barely adequate to fulfill their needs.

The types of postharvest technology and related services currently required for future growth in the fruit and vegetable industry in Ghana include the following:

- Improved processing facilities, including packing houses for fresh fruits and vegetables, and facilities for canning, freezing, brining, drying, and juicing
- Cold storage facilities
- Packaging materials, including improved carton manufacturing, a can manufacturing plant, and flexible packaging (foil or plastic)
- Decay control chemicals
- Increased air cargo space
- Research facilities for postharvest technology, including laboratories and instrumentation
- Improved ocean shipping schedules and rules permitting previously southbound ships to stop free of charge at Tema Harbor when traveling northbound to Europe
- Improved extension services aimed at fruits and vegetables
- Vehicles for extension personnel to travel and visit farmers and agribusinesses
- Routine training courses in postharvest technology
- Management and technical training for agribusinesses
- Access to data network systems for postharvest technology
- Rapid issuance of phytosanitary certificates for shipments of fresh fruits and vegetables destined for export
- A system to aggregate the production of small producers to meet the demands of processors and European importers
- Assistance for exporters in establishing contact with European and other importers
- Market information, particularly in Europe.

3. SUPPLY OF TECHNOLOGY

3.1 Local Research

Two public institutions are responsible for developing postharvest technology, yet neither has an adequate budget or facilities. The Ministry of Agriculture Postharvest Unit is supposed to perform research and development to assist farmers and agribusiness people in obtaining the technology they need. However, it lacks facilities to do its work, transportation to visit farmers and producers, and an adequate budget to alleviate these problems.

The Food Research Institute in Accra has minimal facilities staffed by one postharvest physiologist with a Ph.D. who is capable but lacks adequate equipment and facilities. The budget is insufficient to make any improvements. For example, testing for chemical residues is needed. However, the small existing laboratory does not have a gas chromatograph, preventing the performance of chemical residue testing. The public sector would require adequate facilities, equipment, and budget to be of assistance to agribusiness people. There is no indication these will be provided.

The concept of extension in Ghana has been narrowly defined. Extension has been used primarily with reference to crop production and the distribution of inputs rather than as a mechanism to transfer agricultural technologies to the farmers. In the fruit and vegetable industry of Ghana, there are no extension services for postharvest technology. Generally, harvesting information for exporting producers is provided when the farmer/exporter verbally tells each of his supplying farmers what is needed to fill an export order, which, in the case of pineapple, includes size, color, and ripeness. One example was found in which this information was provided in writing.

The private sector in Ghana has no organized approach toward acquiring the needed postharvest technology. Organizations such as the Horticulturist Association of Ghana are interested in an organization which provides resources for technology acquisition. However, there is no indication that private enterprise is planning any research work in this area for the future. The only organized resource for information on technology for the private sector is the GEPC, which is utilized on an as needed basis. Cases are handled on an individual basis or as appropriate.

3.2 Local Supply of Products

The private sector, particularly importers, are interested in providing products for postharvest processing, but, due to financial constraints, local demand is insufficient to warrant an increase in the provision of these products. The quantity demanded is too small to be very profitable. Local suppliers will not be helpful until they see a way to profit by increasing their efforts. An example of this concerns the chemicals used in the production and postharvest treatment of pineapple. Most importers would view the quantity of this chemical needed as too

small to justify its importation considering the small profit it would generate, or the insignificant loss to farmers who do not opt for these chemicals.

The necessary products for the postharvest handling of fruits and vegetables usually are available to the farmer-exporter in Ghana. However, these products are frequently either expensive, of poor quality, or both. A partial list of products available and in use include:

- Benomyl for decay control in pineapples
- Cartons for shipping fresh fruits and vegetables
- Lorries for movement of produce to the shipping point
- Air cargo space for shipping pineapples to Europe
- Refrigerated containers for shipping pineapples by sea
- Charter aircraft to take fresh pineapples to Europe

The above list indicates that some types of products for postharvest handling and processing are available in Ghana. However, there are difficulties with the availability and accessibility of these products to most farmers and farmer-exporters, such as the following:

1. Benomyl is used in small quantities and therefore is imported either by a chemical company or the individual farmer-exporter in small shipments, causing prices to be high. Sometimes the decision is made not to use a decay control chemical, thereby causing decay problems. The provision of a larger purchasing base will reduce the cost and increase the farmers' ability to purchase this chemical.

2. Cartons are made of relatively low quality paper and on poor quality corrugators. They also are printed with only two, rather than three, colors. These cartons are purchased in small quantities of about 5,000 per order instead of 25,000, which creates additional costs. As a result, the cartons are expensive and of relatively low quality. This can be solved by upgrading the carton manufacturing equipment and providing a larger purchasing base to create larger orders.

3. Lorries are used for many purposes and are in common supply. The quality and costs are not out of line, and therefore no action is needed.

4. Air cargo space is available at times, but is not dependable. A new cargo warehouse and refrigerated storage will be available at the airport by the end of 1992, which will greatly improve the storage situation. However, more regular air cargo space is needed.

5. Reefer containers are available at Tema Harbor. A few spaces at the harbor are available for these containers to be plugged into electricity for a day or two until the ship becomes available for the trip to Europe. This will be satisfactory if an agreement can be reached for the container to be loaded onto a north-bound ship rather than a south-bound ship. The south-bound ships proceed south for several days to service other ports before heading north for Europe. If the ship is required to stop in Ghana on the north-bound leg, there is a high

surcharge, adding an unnecessary cost for the exporter. This could be alleviated through negotiations between the Ghana Port Authority and the shipping lines, resulting in increased export shipping and increased profits for all involved.⁵

6. Charter aircraft are available, especially out of Belgium. This is an expensive service which cuts into exporters' profits. A charter CD-8 aircraft carries 38 tons of fresh pineapple on each trip to Europe. As an illustration of the problem, one exporter chartered an aircraft but was unable to deliver sufficient fruit to fill the aircraft. The aircraft delayed at the airport for an extra day while the exporter delivered the required additional tonnage. However, this fruit was under standard size and was rejected, and the aircraft flew empty back to Belgium. In order to avoid these difficulties, the new air cargo facility currently under construction should be utilized, providing a less expensive mode of transport and encouraging development of a larger production base.

Although there are problems with the availability and expense of current postharvest technologies, there are many successful cases of postharvest handling and processing leading to successful export. The existing problems can be satisfactorily addressed given dedicated effort and consistent growth in the production base, as demonstrated by the success already experienced in the export of fresh mangoes and pineapple.

Following are a couple of prime examples of private sector collaboration in the provision of postharvest handling and processing of horticultural produce. Carton manufacturers and exporters have demonstrated a definite interest in working together. Often, the exporter takes the advice of the carton manufacturer when it comes to material, size, and type of construction for the carton. The art work and printing is a combination of the efforts of both the exporter and the supplier. One carton supplier plans to acquire carton-testing equipment and conduct strength tests soon. There is a high probability that these initial tests will create sufficient interest and demand for carton testing that the quality of the cartons will improve, to the satisfaction of both exporter and supplier.

The Delmas Agencies, a Ghanaian freight forwarder, provides another case of collaboration. Delmas is trying to provide good reefer containers and to assist exporters in shipping fresh pineapples to Europe. Delmas has constructed electric outlets at Tema Harbor near Accra so the containers can be refrigerated while waiting for a day or two for a ship to become available for the trip to Europe. Delmas is also currently negotiating the use of north-bound ships at no extra cost to the exporters. These negotiation efforts are concurrent with joint exporter and Tema Port Authority efforts to arrange for better shipping schedules to Europe.

⁵According to an independent reviewer, the Ghana Port Authority bears no influence on cost for the exporter. Negotiations with the GPA would not lead to an increased export shipping.

3.3 Import/Export of Technology

Most of the technology currently in use has come from abroad through a variety of means. Knowledge of postharvest technology employed by a good number of fresh produce exporters in Ghana was obtained from the Côte d'Ivoire. The process of acquiring such knowledge has, however, been very expensive in most cases and only the well-to-do businessmen have been able to achieve reasonable results in the past five years. Often, the whole exercise has been conducted on a trial-and-error basis, with attendant high costs in terms of money, time, and human resources.

The European equipment firms supplying Ghana generally do not have offices established there. Salesmen visit Ghana and provide considerable information to the Ghanaians. For example, one of the carton plants wants to install new equipment to manufacture cartons. Its information comes from Europe via sales personnel for the equipment who respond to specific requests. This information is valuable but obviously includes special interests of the European suppliers.

Technology is available from trade organizations such as Comité de Liaison Europe-Afrique-Caribes-Pacifique pour la Promotion des Fruits Tropicaux et des Légumes de Centre Saison (COLEACP). One of the Ghanaian farmer-businessmen interviewed is an official of that organization and uses its information. COLEACP is an international nonprofit organization set up in 1973 as part of the European Economic Commission (EEC). It covers Europe and Africa, the Caribbean and the Pacific (ACP). Its function is to act as an interface between ACP exporters and European importers who are members of COLEACP. The basic idea behind its formation is that ACP exporters and European importers cannot single-handedly tackle the complex technical and marketing aspects of the horticultural trade from crop growing to retail distribution. COLEACP provides the following services to its members:

- Assessment of their existing agronomic potential for fruit, vegetables, and flowers.
- Forward-looking analyses of local, regional, and international market demand.
- Opportunities to choose and develop the most competitive export crops suited for the preselected outlets.
- Assistance in accessing air and sea transport facilities by providing reliable, cost-effective delivery for export profitability.
- Solutions to problems in areas ranging from production to marketing of export products at both agricultural and commercial levels.
- Finding the external support to boost the competitiveness of ACP exports and broaden their market outlets.

COLEACP members pay a membership charge and an annual subscription fee. The registered office of COLEACP is at 11, Avenue Des Klauwaerts, 1050 Brussels, Belgium. Other COLEACP offices are in Rungis Cedex, France and in Droitwich, United Kingdom.

The Food and Agriculture Organization (FAO) has an office in Accra. They are a source of information for postharvest technology. The regional office has access to a large data bank at FAO headquarters in Rome. Their Rome address is FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

The U.S. Department of Agriculture, Agricultural Research Service is an excellent source of postharvest technology information. The address is Building 005, BARC-W, Beltsville, MD 20705.

4. STEWARDSHIP

For all practical purposes, extension for fruit and vegetable production does not exist in Ghana. In theory, there is an extension service but no provision to implement it. The required budget, facilities, and transportation for personnel is lacking. There is some talk of providing the necessary support through a loan from the World Bank sometime in the future. If that happens, some extension may be available in a few years.

Although extension and training are not presently available from the public sector, they are badly needed for the future. Therefore, future plans should include budgets and mechanisms for providing extension and training for postharvest technology. Personal experience and past observations by the consultants indicate that joint efforts by the public and private sectors can be effective in developing and distributing postharvest and processing technology. The USDA-ARS has a history of cooperating with private industry to develop and test these services. Usually the organizations share in the costs by making available whatever personnel and equipment are needed to do the work at hand. This can include raw materials (product), equipment, transportation, instrumentation, and trained personnel. In certain situations, the results may be held confidential, but they are usually considered public information. This process is discussed more fully in the recommendations.

With the big void that exists in Ghana for postharvest technology, the private sector satisfies its immediate needs by getting technology from abroad. While inefficient, it is usually the only available solution. In view of public sector's budget problems, this will continue for at least several years. Government agencies will not have the resources to conduct the research to get the technology. The only other solution for the private sector is to join some sort of network or data bank that can provide postharvest technology as it is needed. This networking approach is gaining in popularity and has considerable merit and, therefore, should be part of Ghana's future plans.

5. COLLABORATION BETWEEN PUBLIC AND PRIVATE SECTORS

Most of the government agencies and the people involved in postharvest technology responsibilities seemed genuinely interested in working with private entrepreneurs, but they were held back by budget constraints. The Postharvest Unit of the Ministry of Agriculture faces this problem, as does the Food Research Institute in Accra. Dr. Adu-Amankwa, a postharvest physiologist in fruits and vegetables, is very interested in working with the private sector but has neither the equipment nor the budget to do it.

The potential for closer collaboration between the public and private sectors can best be demonstrated by the USDA's example of cooperating with the U.S. private sector in test exporting fresh fruits and vegetables to Europe. The result of such a collaborative test is that all the interested parties become well acquainted, they know the possibilities of future shipments, and business relations become established between the producer and the importer. Everybody benefits and the test results enter the public domain.

Collaboration in the area of stewardship can also be effective in the area of publicity for new and inexpensive technology, utilizing magazines, newspapers, scientific journals, and advertising. Interested parties can pursue the technology according to their own interests. Of course, a good extension service would be very beneficial but will not be in place in the near future in Ghana.

6. ECONOMIC, BUSINESS AND REGULATORY ENVIRONMENT

6.1 Background of the Ghanaian Economy

Ghana is comparatively well endowed with more than a fair share of both natural and human resources. Indeed, besides her valuable mineral wealth, she has a relatively good supply of land suitable for varied crops and livestock production, considerable fishery and forest resources, and high potential for more hydroelectric power generation.

The country once enjoyed a relatively high standard of living compared with other West African countries, but poor economic management during the 1970s and the early 1980s led to protracted economic decline. Expansionary fiscal and monetary policies, high inflation and an overvalued exchange rate caused a substantial real appreciation of the cedi (local currency), leading to external payment imbalances. Policy makers imposed a range of administrative controls on prices of imports, foreign exchange use, and the distribution of goods and services. The result of these adverse policies was a decline in Ghana's economic performance from 1970 to 1982, as illustrated by the following indicators:

- Real GDP growth was negative by 1981
- Inflation reached 116 percent in 1981
- Exports as a portion of the country's GDP fell from 21 percent in 1970 to 4 percent in 1981
- Domestic savings and the rate of investment declined from 12 to 3 percent and from 14 to 2.2 percent of GDP respectively over the same period

6.2 Macroeconomic Reforms, Market and Price Liberalization

Against this background, the Government undertook a major reorientation of the economy by initiating a package of comprehensive economic and social development programs in the Economic Recovery Program (ERP) of 1983. It has since devalued the currency, dismantled most price and distribution controls, eliminated many subsidies, broadened the tax base, improved tax collection, and provided for more adequate maintenance and capital expenditure. Under the ERP, economic growth has averaged about five percent a year. The current emphasis on ensuring macroeconomic stability includes a fiscal discipline designed to increase public savings, a monetary policy consistent with price stability, and a market-determined exchange rate that is kept stable by a fairly low rate of domestic inflation.

Consequently, the performance of the economy has improved steadily since the introduction of the ERP. Real GDP has grown at an annual rate of 5.9 percent between 1983 and 1987, and at 6.1 percent in 1989. The balance of payments has improved from a deficit of more than one percent of GDP in the period from 1980 - 1983 to an estimated surplus of 2.2 percent in 1989, while the average annual rate of inflation fell to 18 percent in 1991, or a 10 percent decline between December 1990 and December 1991. The overall fiscal deficit (excluding official grants) fell to 4.8 percent of GDP in 1991 from 5.5 percent in 1990 as a result of sustained fiscal adjustment.

6.3 Business Environment

The business environment in Ghana seems favorable. The Ghana Investment Centre (GIC) recognizes the need to assist businesses and keep regulations to a minimum. Once a business is approved, it can commence operations in a regulatory environment that does not appear to be excessive. Plant quarantine regulations are an example of regulations that can be extremely important to businesses if administered in a manner that is thoughtful and cooperative. During the study, the authors were not able to thoroughly assess this area of regulation thoroughly in Ghana; overall, they could find no evidence of an excessive number of problems. The one specific area where the consultants determined that the bureaucratic process needed to be streamlined was in the acquisition of phytosanitary certificates for shipments of fresh fruits and vegetables.

According to a Workshop on Diversifying Ghana's Exports held on October 1 and 2 at the National Conference Centre, Accra, the following are the critical constraints to be overcome in the regulatory environment:

- excessive documentation requirements by public sector agencies and a poor understanding of those requirements by the exporters;
- a lack of understanding by the policy makers of the needs of the non-traditional exporters;
- some weaknesses in some of the exporter incentive schemes, such as the duty drawback and tax rebates;
- inadequate trade representation in key markets abroad;
- weak public sector administrative support to exporters, such as limited working hours for officials based at the ports, and for the port operations themselves;
- an investment code that is not as conducive to foreign investment as it should be;
- ineffective communication with environmental groups and potential overseas buyers 6
Ghanaian wood products that Ghana has an effective environmental protection policy.

6.3.1 Financial Markets⁶

The financial system in Ghana consists of the Bank of Ghana (the Central Bank); 13 commercial banks (with over 320 branches), including three development banks; two consolidated discount houses that support an active and growing interbank money market; and three public financial institutions. There were 11 insurance companies as of October, 1989. There are over 120 small rural banks that are jointly owned by the Bank of Ghana and the local residents. Their activities are limited to the local communities.

The Ghana Stock Exchange specializes in long-term transaction of shares. Over 180 foreign exchange bureaus engage in the buying and selling of foreign exchange, in addition to the 11 commercial banks that participate in the interbank/wholesale market. An active informal banking system exists for small firms and investors.

The Bank of Ghana (BOG) is the Central Bank. It issues currency, holds commercial banks' reserve deposits and some central government deposits, and is responsible for the management of foreign exchange reserves and foreign debt. It is also responsible for bank examination and supervision to ensure that minimum reserve and capital adequacy are met.

As of March, 1991 there were 13 commercial banks with a total of 320 branches distributed across the ten political regions of Ghana. The largest commercial bank, Ghana Commercial Bank, is fully state owned. The other large commercial banks are Barclays Bank (Ghana Limited) and Standard Chartered Bank (Ghana Limited), which are 40 percent owned by Government of Ghana and 60 percent by the UK offices of these banks.

Three of the commercial banks are called development banks: Bank for Housing and Construction, Agricultural Development Bank, and National Investment Bank. Owned by the government, they specialize in medium-term investment lending. The remaining commercial banks, most of which are state owned, include Social Security Bank, Ghana Co-operative Bank, National Savings and Credit Bank, and the Bank for Credit and Commerce (Ghana). Other major public financial institutions include the Social Security and National Insurance Trust, which owns the Social Security Bank, the State Insurance Corporation, First Ghana Building Society Office of Business Promotion, and Post Office Savings bank.

Three banks have little or no government ownership. Merchant Bank is 30 percent government owned, while Ecobank, which was opened in early 1990, is privately owned. The newest bank to open in Ghana, Continental Acceptances Limited, is also privately owned. The Merchant Bank, Ecobank, and Continental Acceptances are all merchant banks, providing financial services to large companies and government agencies; financing trade industry, mining and agricultural activities; and brokering transactions in the capital market.

⁶This section closely follows a report by Younger (March 1991).

The money market in Ghana centers around the activities of the Consolidated Discount House, established in November, 1987, and the Securities Discount Company established in July, 1991. The discount houses are interbank intermediaries dealing in short-term assets to help banks manage their liquidity positions. The short-term deposits accepted from deposit money banks are used to count (until January, 1991) as part of the primary reserve requirements.

The discount houses make markets in central government and BOG debt obligations (91 days to 365 days), 91-day commodity bills, and negotiable certificates of deposit (30 days) issued by banks. Commercial banks are expected to go to the discount houses for reserves rather than to the discount window at the Bank of Ghana. The discount houses have rediscount facilities with the bank of Ghana.

The Capital Market in Ghana is underdeveloped. There is one stock exchange company, the Ghana Stock Exchange Company (GSEC), which started trading in November 1990. It commenced business with 20 organizations to provide a market for the shares and stocks for medium-term and long-term investment. Individuals, groups of individuals, and institutions are eligible to purchase shares. Prior to the establishment of the GSEC, the few transactions that occurred were mainly long-dated government stock, while shares of private companies changed hands occasionally. The National Trust Holding Company (NTHC) quoted shares of 18 companies on a monthly basis. NTHC has a small capital base and the limited number of tradeable shares in the system prevented it from playing a significant role in capital market transactions.

6.3.2 Investment Climate

The government considers private investment (both foreign and local) as the principal engine of growth. The government has, therefore, taken steps to provide a stable macroeconomic framework and an enabling environment for private investors. In line with this emerging economic development strategy, the Petroleum Exploration and Production Law 1984, (PNDCL.84), the Investment Code 1985 (PNDCL.116), and the Minerals and Mining Law 1986 (PNDCL.153) have been enacted to regulate investments in the Ghanaian Economy. These legal documents confer on investors generous incentives, concessions, and attractive benefits within clearly-defined eligibility criteria. The favorable investment climate created by the government has rekindled the private investor's interest, which was adversely affected in the late 1970s. Because of the increased interest of investors, investment laws are scheduled to be reviewed periodically to make them even more attractive and to relieve them of unintended obstacles to investment.

Prospective private investors stand to derive immense benefit from the macroeconomic and sectoral reforms introduced under the ERP -- most notably, the more appropriate prices for cocoa; the rehabilitation of roads, ports, telephones, etc.; the liberalization of imports; the liberalized foreign exchange rate, and the easy remittance of dividends, profits, and other benefits abroad as provided under the investment code. In addition, an existing trade regime

devoid of public intervention and tax reforms, which have, for example, reduced company taxes in the manufacturing sector, have helped to make the business climate more conducive to investment.

The business procedures as they exist now appear simple on paper. However, in the past, potential investors have had a lot of frustration in their attempt to have their applications approved. In his 1991 report, the Trade Commissioner at the Ghana High Commission in Britain asserted that out of 400 prospective British investors who put in applications for approval to establish businesses in Ghana, only 5% had their applications going through the approval process.

It is interesting to note, however, that the Ghana Investment Centre has taken in recent times the necessary steps to eliminate all bottle necks that militate against early approvals of applications. For example, under current regulations, the Centre has the mandate to grant approvals if relevant governmental institutions fail to respond within 14 days to investment proposals which have a bearing on their activities and which are referred to them for comments by the Centre. During recent discussions with the Deputy Director of the Centre, he gave the assurance that if prospective investors are able to satisfy all requirements, their applications could receive the necessary approval within six weeks.

One major hinderance to the early approval of applications is the multiplicity of forms which need to be completed by prospective investors. To avoid duplication of effort and undue delay and thereby speed up the process of obtaining approval, it is necessary to consolidate all existing forms into one standard form. This form must be adopted as the sole form for registration and approval for the establishment of any enterprise in Ghana.

In this connection the underlisted forms currently in use must be withdrawn:

- Form GIC/E1 - Application for Approval under Investment Code 1985 PNDCL.116;
- Form GIC/E2 - Application for Expansion by existing Enterprise under L.I 1998;
- Form "A" - Incorporation of Partnership.

Perhaps the most contentious issue which needs to be addressed is the need for project sponsors to obtain licenses and permits relating to the implementation of approved projects as well as relating to the products, goods, and services. It is imperative that the traditional bureaucracy associated with the granting of licenses and permits by such government agencies be completely eliminated. These measures, if taken, would go a long way to streamlining the existing business procedures.

6.4 Regulatory Environment

6.4.1 Investment

Prospective investors are required to seek approval for their enterprises by submitting formal applications to GIC, which is responsible for approving all foreign investment in Ghana. A formal application would involve the following:

- Four completed copies of Form GIC/EI should be submitted to:

Chief Executive,
Ghana Investment Centre,
Post Office Box M. 193,
Accra-Ghana.
- The application should be supported by a feasibility study or project proposal showing the technical, financial, and economic viability of the project and also justifying the contribution of the venture to governmental sectoral and economy-wide objectives.
- Once approved by the GIC, project sponsors need to obtain all licenses and permits pertaining to the implementation and operation of the approved project, as well as to the products, goods and services. Assistance of the Ghana Investments Centre may be sought in this matter.

In the case of a technology transfer agreement, twenty (20) copies of the draft agreement should be sent to the centre for advice and approval.

To entice foreign investors, there are a number of special allowances granted under the 1985 investment code. Incentives include full exemption from customs import duties on plant, machinery and equipment, accelerated depreciation, tax reliefs, and retention of a minimum of 35 percent of export earnings in an external account. In addition, the investment code guarantees transferability of profits, dividends, etc., in the event of sale or liquidation and guarantees against any level of expropriation. The Investment Codes are provided in detail in Appendix B.

6.4.2 Minimum Foreign Equity Capital Investment Requirement

Under the Investment Code of 1985, wholly (100 percent) foreign-owned ventures could be considered under the following conditions:

- The venture must be a net earner of foreign exchange.
- The foreign equity investment must be US \$100,000 or more.

- In the case of joint ventures with Ghanaian partner(s), the minimum foreign equity investment must be US \$60,000. The shareholding structure of the company is determined by the partners.

6.4.3 Technology Transfer Agreements

Under the Investment Code, technology transfer agreements are defined as:

- The assignment, sale, and use of foreign patents, trademarks and other industrial property rights;
- The supply of foreign technical know-how or technology knowledge;
- Foreign technical assistance, design and engineering consultancy, or technical services in whatsoever form they may be supplied;
- Foreign managerial, marketing or other services, provided that the duration of the agreement exceeds eighteen (18) months.

The conditions under which the Technology Transfer agreement are considered are the following:

- The enterprise must be wholly (100 percent) owned by Ghanaian(s); or
- The enterprise is a joint venture between foreign and Ghanaian partners where the Ghanaian equity shareholding is 20 percent or more.

6.4.4 Imports

Most imports are now uncontrolled in Ghana. Where necessary, special permits can be obtained for imports of the few articles which are restricted. The import duty on capital goods is currently 10 percent. The government regulation is minimal once a business is approved and running.

7. INTELLECTUAL PROPERTY RIGHTS

The 1985 Investment Code of the Republic of Ghana has a section that applies to technology, technology transfer, and the licensing of foreign patents, trademarks, and design. The objective of the technology transfer approval process is to ensure that technology transfer agreements are in consonance with "national development priorities" and that the imported technology is tested, proven, and well-defined with specific and reasonable terms attached. (See Appendix B.)

Patent laws provide for the issuance of patents and protect the owners of these patents. In the area of fruits and vegetables in Ghana, patents are not an issue. Materials and equipment that are imported into Ghana are protected by patent laws of the countries supplying them. If patents, trademarks, or designs are developed in Ghana, they can be protected by local laws. Technology transfer agreements can be made through the Ghana Investment Centre (GIC).

Trade secrets are seldom a problem in the postharvest technology of fruits and vegetables. If trade secrets are developed, there are ways to protect them. This need would most likely exist in the processing or food sciences. Trade secrets were not discovered to be a problem during this study. Everyone seemed to be open with information, with no obvious trade secrets that they were trying to protect.

Overall, it appeared that there was not a significant emphasis on the protection and enforcement of intellectual property rights (IPR) in Ghana in the field of postharvest produce handling and processing, primarily due to the apparent lack of need. If it is necessary to upgrade the enforcement of intellectual property rights, it will require a budget with funds to finance these efforts.

PART II: ISSUES AND IMPLICATIONS

8. EMERGING ISSUES AND IMPLICATIONS FOR THE FUTURE

8.1 The Demand for Fruits and Vegetables

There is a strong effort by the government, farmers, and agribusinesses in Ghana to increase production, processing, and export of fruits and vegetables. To accomplish this goal, a systems approach must be established. Farmers must have a variety of ways to sell fruits and vegetables, because no single segment of the market is capable of absorbing all of these commodities. The channels for selling must include the local domestic market, the processing industry, and the export market. Intertwined in the marketing system are numerous types of postharvest technology such as handling practices from farm to domestic market, handling practices from farm to processor, processing (fresh, canned, brined, pickled, frozen, dried), packaging, refrigeration, storage, and transportation. Regulatory procedures such as quality control and plant quarantine are a part of postharvest handling technology. In a broad sense, government policies must be geared toward the creation of a favorable business climate in which producers and agribusinesses can operate efficiently. Financing must be accomplished right from the start. While the GOG has developed a relatively satisfactory business climate, the existing financing mechanisms are not satisfactory.

It is important to develop a broad production base from which to draw both for processing and for export in order to satisfy the high standards of customers such as those in Europe. Numerous exporters from different countries are competing for these customers by responding to their demands for specific qualities of product, specific quantities, agreed-upon prices, agreed-upon delivery dates, and dependability. A small producer has great difficulty in meeting these demands. Forming a cooperative marketing association composed of small, medium, or large growers is one way to enlarge a production base and at the same time give the farmer the ability to retain the profits for both farming and marketing.

Although Ghana has great potential in the production of fruits and vegetables, much must be done before that potential is realized. The basis for producing and marketing fresh pineapple for Europe already is in place. In 1991, Ghanaian farmers and exporters exported about 10,674 tons of fresh pineapple to Europe each year. Fresh pineapple makes up about 60 percent of the total of Ghana's fruit and vegetable exports. The European market in 1990 was about 206,000 tons per year for fresh pineapple, with Ghana supplying about 6000 tons or three percent of it. Ghana's biggest competitor in this market is the Côte d'Ivoire, which supplied about 141,000 tons of fresh pineapple to Europe in 1990, about 23 times more fresh pineapple than Ghana, although 1991 saw a large increase in Ghanaian pineapple exports.

On the positive side, Ghana's pineapple industry is using the correct variety, Smooth Cayenne, and is producing fresh pineapple with an appearance, taste, and quality satisfactory for the European market.

Also on the positive side, there are several other commodities with considerable production, processing, and marketing potential, such as mangoes, eggplants, chilies (both brined and dried), yams, squash, melons, and papayas. Two problems afflict these commodities: the current low volume of production and European importers' requirements for volume shipments. A farmer or exporter must produce a fairly large volume to make enough profit to justify his efforts in a new product. Most farmers do not have enough capital to develop new products or the necessary markets for those products. Given an adequate budget, market development would be a potential role for the Ghana Export Promotion Council.

On the negative side, much must be done to assist farmers and agribusinesses in the fruit and vegetable industry. The public sector has a reputation for not being able to provide much in the way of postharvest technology. As a general rule, when private sector enterprises want information or assistance in postharvest technology, they acquire without the assistance of the public sector. Because the private sector is under-capitalized, companies usually obtain technology through an informal network of friends in Ghana or neighboring countries or through contacts in Europe. The end result is that the postharvest technology that is used in Ghana barely satisfies the minimum needs.

8.2 Future International Trade

Ghana's short-term market objective for pineapples has been to increase its share of the fresh pineapple export market to five percent in Europe. This is a goal of the GEPC, as shown in its Medium Term Plan for Non-Traditional Export Developments during the 1991-1995 period. Ghanaian exporters have already accomplished this goal, and they want to continue increasing their export volumes. Numerous people commented that Ghana could increase its share of the European market by capitalizing on the aroma and flavor of Ghanaian pineapples. This may be true, but no evidence, such as scientific taste tests, could be found to document that claim of superior quality. A strategic market research study in Europe could test the Ghanaian pineapple's superiority in aroma and flavor over pineapples from Côte d'Ivoire, or at least to be sure that Ghanaian horticultural produce is as good as any others supplied to the European market.

Although exports of vegetables are low, an effort is being made to increase that volume. In 1989, with the assistance of a grant from the Norwegian government, the GEPC instituted a program to increase vegetable exports. This program commenced in November 1990, and by the end of 1990 was responsible for about half of the 48 tons of vegetables exported during 1990. These commodities were chilies, squash, eggplants and melons. This effort will continue through 1993.

A small quantity of mangoes are exported and several small plantings of mangoes are being expanded by planting good exportable varieties such as Haden. Another commodity that should be investigated is asparagus. There is a good demand for fresh asparagus in Europe, and Ghana has the potential for growing and exporting this product. The variety "University of California

#157" is grown in southern Mindanao in the Philippines for export to Japan in growing conditions that are similar to Ghana's.

8.3 Demand for Technology

An extensive number of postharvest technology product lines will be needed for future growth of the fruit and vegetable sector, from the equipment and facilities used to produce fruit and vegetable commodities to those required to bring them to the market. Postharvest technology is necessary if a significant increase in production and exporting is expected. This requires enhanced access to postharvest handling and processing technology and extension services to disseminate information on this technology.

In order for the farmers and agribusiness organizations in Ghana to increase their production, processing, and marketing of fruits and vegetables, they must have access to postharvest technology during the planning stage. First, various kinds of information must be available including sizes of cartons, types of decay chemicals, permissible chemical residues (country by country), types of packaging that are required to compete in specific markets, optimum storage temperatures, description of preservation processes for each commodity, and grade standards and the scientific methods to produce those standards.

The physical technology required by farmers includes tractors, lorries, processing plants, processing equipment, packing facilities for fresh products, cold storage, air cargo freight facilities, refrigerated sea freight facilities, and factories to manufacture packaging materials, such as corrugated cartons, cans, bottles, and flexible packaging like foil and plastic for processed foods. A steady supply of chemicals and fertilizers is also needed. Due to constant changes, the demand for postharvest technology will continue and grow for years to come.

Financing and marketing cooperatives are the two areas in the technology development and usage system that should receive the highest priority in the future.

8.4 Local Technology Development

There are a couple of prime examples of private sector collaboration in the provision of postharvest handling and processing of horticultural produce. Carton manufacturers and exporters have demonstrated a definite interest in working together. Often, the exporter takes the advice of the carton manufacturer as to material, size, and type of construction for cartons. The art work and printing is a combination of both the exporter and supplier efforts. One carton supplier plans to acquire carton-testing equipment and conduct strength tests soon. There is a good chance that these initial tests will create sufficient interest and demand for carton testing that the quality of the cartons will improve, to the satisfaction of both exporter and supplier.

The Delmas Agencies, a Ghanaian freight forwarder, provides another case of collaboration. Delmas is trying to supply good reefer containers and to assist the exporters in their use for shipping fresh pineapples to Europe. Delmas has constructed electric outlets at

Tema Harbor near Accra so the containers can be refrigerated while waiting for a day or two for a ship to become available for the trip to Europe. It is also currently negotiating the use of north-bound ships at no extra cost to the exporters. These improvements are concurrent with the efforts of exporters and Tema Port Authority to arrange for better shipping schedules to Europe.

8.5 Supply of Technology

The public sector is likely to play a limited role in the supply of postharvest technology in the next few years. The new democratic government, scheduled to take over in January, 1993, has already revamped the Constitution. Budgets will continue to be a problem for the incoming government, and no public sector assistance to postharvest technology can be expected for several years. One exception is the Ghana Export Promotion Council. This organization has been very helpful in the overall assistance to export programs and, in so doing, helped bring together organizations that both supply and need technologies.

8.6 Import-Export of Technology

USAID conducted a study during the summer of 1991 called Collaborative Agribusiness Support Program, to investigate the possibility of having a globally-integrated program of postharvest technology that would be available to developing countries served by USAID Missions. This study, done by Winrock International, should be reviewed in formulating a future plan for postharvest technology in Africa. USAID received the study, titled "A Global Plan for an AID/R&D/AGR Postharvest Collaborative Support Program (CASP)", in March, 1992. Fruits and vegetables are covered, as well as seven other food groups: grains, legumes, seeds, animal products, crop byproducts, dairy products, and fish products. The study by Winrock International specifically deals with collaborative agribusiness support. It discusses who is performing research in postharvest technology, who are the major postharvest agribusiness assistance donors, and how multinational corporations collaborate in postharvest technology. This study has a wealth of information that could be used in formulating plans for providing or assisting with postharvest technology in Ghana.

Future technology that could be helpful to Ghana is almost certain to come from abroad. This could include new equipment for fresh fruit and vegetable packing houses, equipment for processing and preserving foods, packaging technology, new equipment for corrugated carton plants, better liner board for making cartons, cold storage facilities and refrigeration equipment, and management personnel and skills to manage the agribusinesses.

8.7 Collaboration

In the future, it is hoped that public agencies in Ghana can collaborate with the private sector in technology development and use by providing personnel, scientific guidance, technical data, instrumentation, and contacts with importers in other countries, and perhaps follow the example of the U.S. collaborative and promotional efforts for fresh fruits and vegetables.

Farmers and agribusiness people may supply the raw materials for their share of the costs. Shipping companies may provide air cargo space or refrigerated container space to conduct simulated and actual tests of moving products to market. In the opinion of the consultants, this is the most practical and expedient method of developing and distributing postharvest technology. Private industry will be quick to adapt the fruits of this type of research to its own commercial needs. Good working relationships and trust are developed between public and private sectors without any undue financial burden on any one agency or group.

Japan's International Cooperation Agency (JICA) uses a very effective approach to the provision of postharvest technology to developing economies. With an annual budget of seven billion U.S. dollars, the agency is active in agriculture and postharvest agribusiness activities. Along with technical assistance, JICA provides large amounts of Japanese equipment, such as complete food processing pilot plants with full instrumentation. It trains personnel to use and maintain this equipment. This is precisely what the Ghana MOA Postharvest Unit and the Food Research Institute needs.

PART III: CONCLUSIONS AND RECOMMENDATIONS

9. CONCLUSIONS

9.1 Current Situational Analysis

The present situation regarding postharvest technology in Ghana is relatively simple -- the interest, need, and demand is very great. The supply is very limited. Agriculture is by far the predominant employer of people in Ghana, good land is available for expansion, water generally is in good supply, and there are both local and export markets for food products. The great potential for expansion of agricultural exports is recognized by many people and agencies: government, farmers, agribusinesses, chemical companies, farm equipment dealers, suppliers of packaging materials, refrigeration equipment suppliers, bankers, freight forwarders, air cargo companies, ocean shipping lines, and many more. In particular, farmers and associated agribusinesses are in the process of trying to expand and increase their production volumes and the resultant total profits. The key missing ingredient outside of the capital needed is postharvest technology. Government agencies would like to provide this technology but are unable to do so because of insufficient budgets. The private sector is doing its best to get the needed technology to expand their businesses, but generally the businesses are too small and cannot afford the costs.

In addition, information about technology acquired by the private sector often is not verified and is insufficient to comfortably conduct business and comply with existing laws and regulations. For example, in applying decay control chemicals on fresh fruits and vegetables for export, the exporter will follow the instructions on the label of the chemical container. The exporter is often not aware of the level of allowable chemical residue on the fruits, does not have the equipment to test the residue level, and cannot ensure it is within legal tolerances. More sophisticated technology to conduct this testing would be desirable, but only the most necessary technology can be obtained due to scarce resources.

Another important factor in agribusiness, which includes farming, is the small size of the individual production bases. It is difficult to operate a business, such as processing or exporting, unless there is a large enough supply of products to have efficient operations, satisfactory quality, and large-scale marketing. Small production bases encounter difficulties with filling export orders. If the production base is small, available fruits and vegetables are insufficient to supply the correct quantity and quality requested by the customer. Obviously, it is imperative that the customers receive the product they ordered and that delivery dates are met, particularly in fresh fruits and vegetables.

An example of this problem can be found in the corrugated carton business. Most packers of fresh pineapple in Ghana think that ordering 5,000 or 10,000 empty cartons from a carton plant is a large order. Although the carton suppliers fill these orders, they do it inefficiently and at high cost. In a mechanized corrugating plant, a minimum order normally

is considered to be 25,000. Shorter orders require excessive setup time to change the carton manufacturing equipment. In addition, the size of the lorry delivering the order also dictates that an order of 25,000 cartons can be transported at less cost per box than smaller loads.

Food processing and food processing technology need to be improved both in quantity and quality. Food processing is necessary to efficiently use all farm products. The system of marketing farm products must include (1) selling fresh in local markets, (2) selling fresh in export markets, and (3) processing for sale in both local and export markets. A first step toward increasing food processing technologies, and a good area for public and private sector collaboration, would be a pilot food processing laboratory.

9.2 Implications for the Future

Marketing must be an integral part of any plan to increase the agricultural base for production of fruits and vegetables. Three things are essential for successful marketing of the entire production--local marketing, processing (both in fresh and other forms), and export marketing. The local markets are already operating in a reasonable manner. Both processing and export marketing need considerable improvement. To do this, considerable postharvest technology will be needed. It is unlikely that this technology will be provided in the foreseeable future without the assistance of USAID or other donors.

Assuming that adequate postharvest technology is provided in a timely manner in the next few years, it will still be necessary to provide a sizeable production base for each agribusiness to operate efficiently. Forming marketing associations to market the production of a group of producers, who alone are not big enough to market efficiently, can allow individual farmers to share in the increased benefits and efficiencies from pooled efforts. Farmers, producers, or agribusinesses can form a marketing cooperative whose purpose is to market all the production of its members. The cooperative, a nonprofit organization, can provide a large production base from which producers can operate, find markets for their products and set up a purchasing arm so that they can pool their orders and purchasing power to get needed supplies (such as fertilizer, chemicals, cartons, cans) at the lowest possible cost. Typical of a very successful American marketing cooperative is Sunkist Growers, Inc. Sunkist is the marketing arm worldwide for over 6,000 growers and about 65 citrus-packing houses. They also have a purchasing service to provide members with "economies of scale."

Regulatory agencies in Ghana appear to be satisfactory with respect to tariffs, investments, profit retention, profit repatriation, and joint venture formation. However, this should be watched as the new democratic government formulates its policies after January, 1993.

Plant quarantine policies are important in developing agricultural industry, especially regarding fruit and vegetable exports. The present policies appear to be satisfactory but the agency responsible lacks an adequate budget. This problem should be addressed as policies and assistance are developed for improving postharvest technology. As a rule, the demands of the

importing countries must be met so that Ghanaian exports are acceptable to the importing countries.

The bulk of this report deals with pineapples, which is appropriate for the immediate future. Looking further ahead, other fruits and vegetables should be considered to broaden the supply base and to increase the volume produced by farmers. Growing additional crops also will diversify the risk that is inherent with only one crop.

The following list includes crops that are commonly grown in the tropics and may present possibilities for future production in Ghana:

Avocado	Rose Apple	Peppers (Chilies)
Banana	Sapota	Potato
Black pepper	Vanilla vine	Radish
Brazil nut	Asparagus	Sesame
Carombola (Starfruit)	Beans	Snow peas
Cashew	Bitter gourd	Squash
Cherimoya	Broccoli	Peppers (Sweet)
Chinese pear	Cabbage	Sweet corn
Coconut	Cassava	Sweet potato
Custard apple	Cauliflower	Taro
Durian	Chayote	Tomato
Granadilla	Chickpea	Watermelon
Grapes	Chinese cabbage	Yam
Guava	Chinese spinach	Ginger
Jackfruit	Cowpeas	
Longan	Eggplant	
Lychee	Jerusalem artichoke	
Mango	Leeks	
Mangosteen	Lentil	
Papaya	Lettuce	
Pili nut	Mungbean	
Pistachio nut	Okra	
Plantain	Onion	

Ghanaian universities received very little attention in this study. The information available about universities indicates that they are not involved in any postharvest activities such as research and extension, although most developing countries use their universities as sites for postharvest research and extension work. Time constraints and long travel distances did not permit the consultant to visit universities.

As a precursor to making recommendations for promoting future collaborative efforts in postharvest handling and processing technology development in Ghana, a list of needed technologies and the reforms is useful. The types of postharvest technology and reforms in related business infrastructure currently required for future growth in the fruit and vegetable industry in Ghana include the following:

- Improved processing facilities including packing houses for fresh fruits and vegetables, and facilities for canning, freezing, brining, drying, and juicing.
- Cold storage facilities.
- Packaging materials, including improved carton manufacturing, a can manufacturing plant, and flexible packaging (foil or plastic).
- Decay control chemicals.
- Increased air cargo space.
- Research facilities for postharvest technology such as laboratories and instrumentation.
- Improved ocean shipping schedules and rules permitting previously southbound ships to stop free of charge at Tema Harbor when traveling northbound to Europe.
- Improved extension service aimed at fruit and vegetable production.
- Vehicles for extension personnel to travel and visit farmers and agribusinesses.
- Routine training courses in postharvest technology.
- Management and technical training for agribusinesses.
- Access to data network systems for postharvest technology.
- Rapid issuing of phytosanitary certificates for shipments of fresh fruits and vegetables destined for export.
- A system to aggregate the production of small producers to meet the demands of processors and European importers.
- Assistance for exporters to contact importers in Europe and other countries. Expanding GEPC's scope would be helpful.
- Market information, for Europe and elsewhere.

- Closer collaboration between public and private sectors, in particular in promoting exports and in development of new export crops in Ghana.

This collaboration can best be illustrated by an example of how the USDA cooperates with the U.S. private sector in exporting fresh fruits and vegetables to Europe. If research needs to be done to test the shipping capabilities of a commodity or equipment, the USDA works with private companies to make shipping tests from the United States to the designated site. Usually the private company supplies the commodity (such as fresh asparagus), a shipping company supplies a reefer container, the USDA provides personnel and instrumentation to supervise the test, and a European importer agrees to complete the test. The test results are available to the public. The result of such a collaborative test is that once all the interested parties become well acquainted, they know the possibilities of future shipments, and business relations become established between the producer and the importer. Everybody benefits and no one group has to absorb all the cost and risk.

9.3 Market Opportunity Analysis

The scope of work for this study asks for a market opportunity analysis which identifies where opportunities for private sector investment exist in the continuum from private technology development and testing to distribution and sale.

The most important thing the private sector can do is to position itself in the European market so that importers have a good opinion of fruits and vegetables from Ghana. In the eyes of the European importers, this means providing products in demand by their customers. The importers look for a source of supply that is dependable and that provides the requested quantity, quality, uniform products, packaging, and other features so important in supplying perishable foodstuffs to their customers. Importers do not want to buy from suppliers who cannot satisfy their demands. To position themselves favorably in the views of European importers and the European market in general, the following steps are suggested for the private sector:

1. Continue to expand the production of Smooth Cayenne pineapple to provide a production base large enough to ensure that customer quantity and quality demands can be met. The pineapple planting material in use is good, but there is a clone of Smooth Cayenne that is recognized around the world as being even better. This is Smooth Cayenne clone Champaka F-153. Most pineapple experts consider Champaka F-153 to be the best for the future fresh fruit market. The Ghanaian private entrepreneur who acquires and expands production of this clone could probably become a major leader in Ghanaian pineapple exports, even when available pineapple supplies become considerably greater, because fruit quality would be a deciding factor in exporting pineapple. This may not be considered a postharvest technology problem now but may be very important to the industry in the future.

2. Visit production areas in the Côte d'Ivoire and the Caribbean that supply fresh pineapple to Europe to learn their postharvest handling and processing techniques. These technologies are more likely to be transferable and affordable than those coming from places such as Hawaii.
3. Visit the markets in Europe to see what is needed, acceptable, and competitive in those markets. Meet the importers on their home grounds.
4. Organize one or more marketing cooperatives in Ghana to conduct export marketing efforts and to purchase and import needed supplies for farmers and agribusinesses.
5. Work with public agencies to get postharvest handling technology. In general, public agencies want to use their time and money to provide products and information which are useful to the private sector. In order to accomplish this, the public and private sectors need to hold ongoing substantive discussions regarding their respective needs and capabilities. Large cooperatives which encompass farmers and farmer-exporters can play an effective role as intermediaries, allowing the farmers to concern themselves primarily with production.
6. Collaborate more closely with the Ghana Export Promotion Council to address the needs of the farmer-exporters.
7. Assist in the development of better packaging, particularly in regard to materials and graphics. This may be accomplished by establishing a packaging research facility in an existing organization such as the Food Research Institute. The results could be used by all Ghanaian entrepreneurs, including those operating outside the fruit and vegetable industry. However, the establishment of this type of research effort is not likely to occur in the near future.
8. At the present, fruits and vegetables produced by farmers are either sold for local consumption or exported. A small quantity is processed into juices. There is a big need for food processing facilities for fruits and vegetables. There also is a need for a pilot plant food processing laboratory that can guide and assist private entrepreneurs in phytosanitary requirements and in setting up food processing factories. Both the public and private sector could take joint responsibility in setting up these facilities. In the final analysis, the private sector should let the public sector know what it needs (such as the pilot plant food processing laboratory). The technology, along with improved packaging, can then be used by the private entrepreneur to establish food-processing factories.

9. Considerable work is being done in the public sector regarding the regulatory and business environment. It is suggested that government regulations and reforms be reviewed frequently, paying particular attention to streamlining of the phytosanitary approval process for exports of fruits and vegetables, which is currently under review.

The foregoing suggestions are aimed at enhancing Ghana's reputation with European importers as a producer of high quality fruits and vegetables by conducting a strong marketing effort. These efforts could be duplicated for other produce for which Ghana may have a competitive advantage and which have high market demand potential. Market demand and production potential studies, trial plantings, and many of the other efforts necessary to establish a new product in an export market, either as fresh produce or in a processed form, all require considerable capital and could take advantage of collaborative efforts between the public and private sectors.

AID's role in this product development effort could be to provide technical assistance and training in the areas of production, strategic marketing, handling, packaging, and exporting. AID could assist in coordinating public and private efforts, and in determining what types of assistance might be required. Start-up time for new product development would be at least four years.

10. RECOMMENDATIONS

As a result of this study, the authors make several recommendations for steps that USAID and the Government of Ghana, in conjunction with the private sector, can take toward increasing the development and use of postharvest handling and processing technology for fruits and vegetables. Although much more work is required, these recommendations are important initial steps toward a stronger sector.

10.1 Global Postharvest Information Network

A good method of transferring postharvest technology is to establish a global network of information that is available to USAID missions and to LDCs. Such a network should provide the necessary information in a timely and inexpensive manner. Envisioned is a collaborative postharvest information network that has numerous centers around the world which can collect the information from local or regional sources and then share it with a central postharvest information center that is easily accessible by the potential client. The clientele could be of many types -- USAID missions, universities, agribusinesses, processors, fruit packers, exporters, importers, and many more. In addition to being easily accessible, responsive, and inexpensive, an information networking system of this type should have a very extensive data base of postharvest handling technology from around the world.

This can and is being done by numerous "centers of excellence." However, these various computerized information networks either are not linked with other computerized centers or are not adequately linked to be considered global in nature. Usually, they are funded locally or regionally and have neither the funds nor the mandate to become a global networking system. As a result, these postharvest information networks do not contain adequate global information and cannot service clients world-wide. Their clients may miss important technological information.

As a complement to the efforts of the Collaborative Research Support Program (CRSP), a global collaborative postharvest information network would be extremely helpful. Such a system is technically feasible according to computer experts. Computers can be linked or information exchanged so that postharvest technology data bases can contain complete global information from the participating data bases and computer networks. One organization needs to take the lead and organize such a global network system. The network system can then support postharvest programs, and agribusinesses can benefit from easy access to necessary postharvest information.

As the first step toward the establishment of a global collaborative postharvest information network, a few well-established data bases could be joined together as the nucleus, to be built upon later. Three well-known data bases, already collaborating together and with compatible or linkable computer technology, could form this nucleus: the Postharvest Documentation Service (PHDS) at Kansas State University, the Postharvest Institute for

Perishables (PIP) at the University of Idaho, and the ASEAN Food Handling Bureau (APEX) at Kuala Lumpur, Malaysia. Others also in existence could be added and expanded upon.

While this proposed global collaborative postharvest information network would not become fully operable for at least five years and more likely ten years, the PIP information network at the University of Idaho already exists. The PIP facility processes annually thousands of requests for postharvest information. It already is associated with USAID and could immediately fit into postharvest technology programs proposed for the future. APEX at Kuala Lumpur, Malaysia is also in full operation and is very cooperative in providing postharvest technology. In addition, there are numerous other centers of this type around the world which can be accessed from Ghana. The MOA Postharvest Unit or the Food Research Institute could establish contact with PIP and ASEAN APEX and develop regular information connections, given the budgetary allocation to start up.

10.2 Agricultural Marketing Associations

In order to provide a sizeable production base for each agribusiness to operate efficiently, agricultural marketing associations should be developed. This can be done in such a way that the individual farmers can share in the increased benefits and efficiencies. Agricultural marketing associations can market the production of a group of producers, who alone would not be big enough to market efficiently or well. The best known method is for farmers, producers, or agribusinesses to form a marketing cooperative for the sole purpose of marketing all the production of the cooperative members. The nonprofit cooperative, having a large production base, will be able to find customers and to set up a purchasing arm so the individual producers can pool their orders and purchasing power to get their needed supplies (such as fertilizer, chemicals, cartons, and cans) at the lowest possible cost.

An important factor in a marketing cooperative is that each individual member is entitled to one voting share regardless of the member's size. Another good feature is that each member agrees to market all of his product through the cooperative. This permits a stronger price demand by the marketing cooperative without the threat that an individual member will ruin the price schedule by agreeing to a lower price outside the cooperative.

A large marketing cooperative can receive more attention from an agency that supplies postharvest technology than does a small organization. The marketing cooperative creates more clout for its members than the members can get individually.

10.3 Export and Agribusiness Training

Closer collaboration between public and private sectors in the area of export training could provide considerable assistance in promoting exports, as was shown by the example of USDA cooperation with the U.S. private sector.

This collaborative approach has been effective in developing methods of shipping fresh fruits and vegetables from the U.S. to Europe. This is exactly what needs to be done in Ghana to advance shipping procedures for pineapples and other commodities such as mangoes, melons, and papayas. Participants in this effort could include the Ministry of Agriculture's Postharvest Unit, farmers, exporters, a reefer container supplier, an ocean shipping line, and an importer in Europe. Two necessary, but unavailable, ingredients are a large commodity supply base of the necessary quality to meet the demand of importers and a budget that would permit travel. This collaborative effort would involve initiating contacts, planning, preparing shipping, and traveling to the final destination to observe the results and cement relationships between the exporter and the importer. This has been done successfully in Thailand, resulting in shipments to both Europe and Japan.

There are many good ways of providing training in cultivation practices, postharvest handling, exporting, processing, and managing agribusinesses. The Winrock International report about the Collaborative Agribusiness Support Program for USAID discusses this at some length. Training programs designed for specific technical problems, such as handling, grading, and packing fresh pineapples for export or organizing marketing cooperatives, are highly recommended for Ghana. In their own investigations, the consultants found a generally favorable attitude and interest in a seminar of this type.

A short-term internship for Ghanaian businesspeople in U.S. agribusinesses was proposed as a second training method. A trainee in such a program would observe and participate in all phases of the U.S. operation to become familiar with their practices. Upon completion of the internship period, the trainee would apply his or her new knowledge in the Ghanaian enterprise. As a follow-up, one of the trainers would visit the Ghanaian enterprise to assist in the implementation of the new practices.

10.4 Support for the Ghana Export Promotion Council

Increased financial support and publicity for the GEPC would increase its ability to carry out its mandate and to assist in export assistance and promotion activities. The GEPC is already known and respected by the USAID/Accra Mission and is doing what the consultants feel is a creditable job of supporting and expanding exports of fruits and vegetables. The organization could be used further for conducting seminars, informing farmer-exporters about export requirements, contacting potential importers in Europe, and advising farmers and exports on sources of technology or information.

10.5 Food Processing Laboratory

Ghana needs a modern pilot food processing laboratory. A pilot laboratory along the lines of those established by JICA, equipped with modern food processing and testing equipment, would assist in the establishment of a strong food processing sector for fruits and vegetables. USAID could assist with the establishment of such a plant and provide training in the maintenance and use of the equipment, which could then be passed on to the greater body of the

agribusiness private sector. Establishment at the Food Technology Laboratory in Accra is suggested. The universities in Ghana do not currently have the capacity for such a facility.

10.6 Provision of Postharvest Technology

Developing and providing access to postharvest technology is a task which can best be undertaken, both jointly and independently, by the public and private sectors. The GOG has made considerable progress toward providing a business climate in which farmers, exporters, processors, and investors can effectively operate and expand. USAID can be involved by working with both the public and private sectors to assist, augment, and, in many situations lead the effort to provide postharvest technology. USAID's role may be to take the lead in assisting in the dissemination of information regarding available technologies and providing technical assistance in those technologies. The technical assistance team can initially train local public and private organizations or individuals in the technological fields, enabling them to pass the knowledge on in the future.

10.7 Review of the Collaborative Agribusiness Support Program Report for USAID by Winrock International

The collaborative agribusiness support program report for USAID by Winrock International has many suggestions, recommendations, pieces of information, and ideas that are applicable to the goals for Ghana. The report should be reviewed to determine its application to, and usefulness for, Ghana.

BIBLIOGRAPHY

Buescher, Dr. Ronald, Winrock International Institute for Agricultural Development. Planning a Collaborative Agribusiness Support Program on Postharvest Development: Perishable Products.

Ghana Export Promotion Council. 1991. Medium Term Plan: Non-Traditional Export Development (MTP-NTE) 1991-1995. Ghana.

Ghana Investment Center. 1990. The Investor, Vol. 1, No. 1. Ghana 1990.

Ghana Ministry of Agriculture. 1990. Ghana Medium Term Agricultural Development Program. Ghana.

La Gra, Jerry. 1990. A Commodity Systems Assessment Methodology for Problem Identification, Postharvest Institute for Perishables. Moscow, Idaho.

Reiling, Peter. 1989. Report to the World Bank on the Involvement of Small-Scale Farmers in the Ghanaian Pineapple Export Market. Norwalk, Connecticut: Technoserve.

United States Department of Agriculture, Tropical Products Transport Handbook, Agricultural Handbook No. 668.

Winrock International Institute for Agricultural Development, for USAID/R&D/AGR. 1992. A Global Plan for an AID/R&D/AGR Postharvest Collaborative Agribusiness Support Program.

Younger, Stephen. 1991. Monetary Management in Ghana, Working Paper No. 8, Cornell Food and Nutrition Policy Program. Washington, D.C.: Cornell Food and Nutrition Policy Program.

APPENDICES

APPENDIX A

CONTACTS

Dr. A. A. Owusu	Managing Director, Astek, Accra
Mr. Marwan Traboulsi	Chairman, Farmex, Accra
Mr. Ali Traboulsi	Managing Director, Farmex, Accra
Mr. E. B. Koranteng	Managing Director, Koranco Farms, Accra
Mr. J. L. Okrah,	Executive Director, MFO Farms, Accra
Mr. Naaman A. S. Ashkar	Managing Director, Akramang Farms, Accra
Mr. Romeo Gyimah	Managing Director, Foodimplex, Accra
Mr. Francis O. Okoro	Managing Director, Greentex Farms, Accra
Dr. Ester A Ocloo	Managing Director, Nkulenu Industries, Legon, Accra
Mr. S. K. Enuson	General Manager, GIHOC Cannery Co., Nsawam
Mr. Victor Clottey	Quality Control and Research, GIHOC Cannery Co., Nsawam
Mr. C. O. Palm	Chief Accountant, GIHOC Cannery Co., Nsawam
Mr. E. A. Sowah	General Manager, Paper Conversion Co., Takoradi
Mr. Alhaji G. Mahama	Operations Coordinator, Paper Conversion Co., Takoradi
Mr. H. H. Dhawan	Managing Director, Packrite Cartons & Packaging Industries, Accra
Mr. S. S. Liu	Director, Ghana Carton Boxes Mfg. Co., Accra
Mr. Laurent Kaelin	Manager, Reiss & Co (Chemicals), Accra
Dr. Pearl Adu-Amankwa	Postharvest Physiologist, Food Research Institute, Accra

Mr. T. T. Addy	Port Director, Tema
Mr. James Parr	General Manager, Delmas Agencies (Freight Forwarder)
Mr. Herbert Christiner	Directeur Commercial, Delmas Agencies, (Freight Forwarder)
Mr. Charles A. Adjei	Deputy Director General (Technical), Ghana Civil Aviation Authority, Accra
Mr. Kwaku Nicol	Postharvest Development Unit, Ministry of Agriculture, Ghana
Ms. Ernestina Agyiri	Postharvest Development Unit, Ministry of Agriculture, Ghana
Mr. Fred Macbruce	Ghana Standards Board, Accra
Mr. Kay Amoah	Deputy Director, Ghana Investments Centre, Accra
Mr. E. B. Ashong-Lartey	Projects Officer, Ghana Investment Centre, Accra
Mr. K. A. Ohene-Obeng	Assistant Registrar, Registrar Generals Department, Accra
Mr. G. A. Dixon	Deputy Director, Plant Protection & Regulatory Services, Ministry of Agriculture, Accra
Mr. James Herne	Senior Programs Officer, Technoserve, Accra
Mr. Keita Fode	Specialist in Pineapple Culture, Travaux Agricoles, Dabau, Côte d'Ivoire
Mr. Peter Weisel	Agricultural Economist, USAID Mission, Accra
Mr. David J. Anderson	Pineapple Specialist, Anderson Associates International, Bakersfield, California, USA

55

APPENDIX B

LIST OF NAMES AND ADDRESSES OF KEY ACTORS ENGAGED IN ACTIVITIES RELATED TO FRUIT POSTHARVEST TECHNOLOGY IN GHANA

	NAME AND ADDRESS	NATURE OF ACTIVITY
1.	Adicopa Farms Ltd. P.O. Box 9303 Accra Tel.: 772139 Telex: 2649 Gh. Fax: 772350	Pineapple Production & Export
2.	Afarco Farms Ltd. P.O. Box 13827 Accra	Pineapple Production & Export
3.	Akramang Farms Ltd. P.O. Box 7189 Accra-North Tel.: 223757/226446/227602 Telex : 2122 Gh.	Pineapple Production & Export
4.	Ama Konama Export P.O. Box G 970 Accra-North Tel.: 775836	Pineapple Production & Export
5.	Burt & Barker Farms Ltd. P.O. Box 11904 Accra-North	Pineapple Production & Export

- 6: **Combined Farmers Ltd.** **Pineapple Production & Export**
P.O. Box 9796
Kotoka International Airport
Accra

Tel.: 774922
Telex : 2319 Confarm Gh.
Fax : 774220
7. **Danakot Farms Ltd.** **Pineapple Production & Export**
P.O. Box 10958
Accra-North

Tel. : 667467/666121
8. **Doswak Farms Ltd.** **Pineapple Production & Export**
P.O. Box 8573
Tema

Tel. : (0221) 6049
9. **Fako Farms Ltd.** **Pineapple Production & Export**
P.O. Box 15908
Accra-North

Tel.: 224477/227002
Telex: 2165 Fako Gh.
Fax: 227002
10. **Farmex Ltd.** **Pineapple Production & Export**
P.O. Box 9892
Airport, Accra

Tel.: 776366
Telex: 2219 Farmex Gh.
Fax: 774007
11. **G. Brands Impex Ltd.** **Pineapple Production & Export**
P.O. Box 9827
Accra

12. Gemare Gh. Ltd. Pineapple Production & Export
P.O. Box 0763
Osu, Accra

Tel.: 229427
Telex: 2685
13. Gabrho Farms Ltd. Pineapple Production & Export
P.O. Box 1307
Accra

Tel.: 666978
14. George Fields Farms Ltd. Pineapple Production & Export
P.O. Box 12762
Accra-North

Tel.: 229135
15. Gracittah Enterprise Pineapple Production & Export
P.O. Box C.284
Cantonments, Accra

Tel.: 666631
16. Greenspan Farms Ltd. Pineapple Production & Export
P.O. Box C.1062
Cantonments, Accra

Telex: 2289 Export Gh.
17. Greentex Farms Ltd. Pineapple Production & Export
P.O. Box 4429
Accra

Tel.: 663893
Telex: 2362 Ece Gh.
18. John Lawrence Farms Ltd. Pineapple Production & Export
P.O. Box 8132
Accra-North

Tel.: 221713
Telex: 3033 Gh.

19. **Koranco Farms Ltd.** **Pineapple Production & Export**
P.O. Box 166
Accra

Tel.: 666293
Telex: 2320 Gh.
Fax: 666291
20. **Larome Farms Ltd.** **Pineapple Production & Export**
P.O. Box 14022
Accra

Tel.: 229486
Telex: 2289 Export Gh.
21. **Mashaco Est.** **Pineapple Production & Export**
P.O. Box 15740
Accra

Tel.: 665311
Telex: 3041/2394
22. **MFO Farms Ltd.** **Pineapple Production & Export**
P.O. Box X-1106
Cantonments, Accra

Tel.: 227120
23. **Nicap Farms Ltd.** **Pineapple Production & Export**
P.O. Box 11763
Accra-North

Telex: 3033 Gh.
24. **Paradise Farms Ltd.** **Pineapple Production & Export**
P.O. Box 0783
Osu, Accra

Telex: 2394
Fax: 773593

- | | | |
|-----|----------------------------------------------------------------------|-------------------------------|
| 25. | Seiwah Consolidated Farms
P.O. Box 10130
Accra-North | Pineapple Production & Export |
| | Tel.: 776824
Telex: 3031
Fax: 668263 | |
| 26. | Tropiculture Farms Ltd.
P.O. Box C708
Cantonments, Accra | Pineapple Production & Export |
| | Tel.: 772642
Fax : 772642 | |
| 27. | Uche Farms Ltd.
P.O. Box 15727
Accra-North | Pineapple Production & Export |
| | Tel.: 665588
Telex: 3033 | |
| 28. | Ukays Tropical Products Ltd.
P.O. Box 7443
Accra-North | Pineapple Production & Export |
| | Tel.: 226183 | |
| 29. | Worsteb Farms Ltd.
P.O. Box 16197
Kotoka Int. Airport
Accra | Pineapple Production & Export |
| 30. | Zako Farms Ltd.
P.O. Box 350
Accra | Pineapple Production & Export |
| 31. | Astek Industries Ltd.
P.O. Box 4710
Accra | Fruit Processor |
| | Tel.: 221473 | |

- | | | |
|-----|---------------------------------------------------------------------------------------------------------------------|---------------------------|
| 32. | Nkulenu Industries Ltd.
P.O. Box 36
Legon | Fruit Processor |
| 33. | Chemico Ltd.
P.O. Box 104
Tema | Importer of Agrochemicals |
| 34. | Dizengoff Ghana Ltd.
P.O. Box 3403
Accra

Tel.: 221831
Telex: 2032
Fax: 227601 | Importer of Agrochemicals |
| 35. | Reiss & Co. (Gh.) Ltd.
P.O. Box 3074
Accra

Tel.: 775359/775484
Telex: 2040 Reico Gh.
Fax: 772942 | Importer of Agrochemicals |
| 36. | Ghana Carton Boxes Manufacturing
Company
P.O. Box 7676
Accra-North | Carton Manufacturing |
| 38. | Packrite Cartons & Packaging
Industries Ltd.
P.O. Box 8872
Accra-North

Tel.: 221173 | Carton Manufacturing |
| 39. | Cold World Ltd.
P.O. Box 15123
Accra-North

Tel.: 227338 | Cold Storage Operator |

61

- | | | |
|-----|-------------------------------------------------------------------------------------------------------------|--------------------|
| 40. | Cargo D'or Limited
P.O. Box 9796
Airport, Accra

Tel.: 774220/773527
Fax: 774220 | Freight Forwarders |
| 41. | Delmas Agencies (Gh.) Ltd.
P.O.Box BP 57
Tema

Tel.: 0221 - 2970
Fax: 21712936 | Freight Forwarders |
| 42. | Race Cargo Airlines
P.O. Box 16151
Airport, Accra

Tel.: 773082 | Freight Forwarders |
| 43. | Umarco (Gh.) Ltd.
P.O. Box 215
Tema Harbour Area

Tel.: 0221 - 4031-5
Telex: 2037 MAFRIC Gh. | Freight Forwarders |

PUBLIC INSTITUTIONS

- | | | |
|-----|-------------------------------------------------------------|----------------------|
| 44. | Gihoc Cannery Company Ltd.
P.O. Box 115
Nsawam, Ghana | Fruit Processing |
| 45. | Paper Conversion Company
P.O. Box 5774
Accra-North | Carton Manufacturing |
| 46. | Food Research Institute
P.O. Box M.20
Accra | Postharvest Research |

47. Ghana Standards Board
P.O. Box M.245
Accra

Quality Control & Certification

Tel.: 662942/776191-2

48. Postharvest Unit
Ministry of Agriculture
P.O. Box M.37
Accra

Extension of Postharvest technology

Tel.: 665421

APPENDIX C
GHANAIAN BUSINESS CODES

INCENTIVES, BENEFITS, AND CONCESSIONS UNDER THE INVESTMENT CODE, 1985 (P.N.D.C. LAW 116)

Under the Investment Code, 1985, prospective entrepreneurs are assured of a wide range of attractive **GENERAL** incentives, benefits and concessions offered to all investors. In addition, the entrepreneurs who invest in the declared priority areas of investment, also enjoy numerous packages of generous and attractive **SPECIAL** incentives, concessions and benefits. A new law is in the process of being issued which would further widen areas of the economy for priority incentives and benefits. The areas to be accorded priority status include new investments in the sectors of manufacturing, tourism and general services which provide services or produce items that enhance activities in the declared priority sectors of the economy.

These investment incentives and benefits are specially designed to grant relief from taxation in various forms, etc to investors. They include:-

- full (100%) exemption from customs import duties on plant, machinery and equipment required for the enterprise;
- accelerated depreciation;
- locational incentives in the form of tax reliefs;
- retention of at least 35% of export earnings in an external account;
- guaranteed immigrant quota in respect of the approved number of expatriate personnel;
- exemption of personal remittance quota for expatriate from any tax on transfer outside;
- permission to operate an external account in which may be retained a portion of foreign exchange earnings for use in acquiring spare parts and other inputs for the enterprise;
- exemption from payment of Selective Alien Employment Tax.

In addition, the Investment Code, 1985 assures investors of other wide range of investment guarantees. These include:-

- guaranteed transferability of profits, dividends, royalties, directors' fees and capital in the event of sale or liquidation of the approved enterprise;
- guarantee against expropriation of the enterprise;
- guarantee against being forced to cede any interest in the enterprise.

In keeping with the pre-requisites of creating the required attractive and stable enabling environment for investors, the Code also sets out clear procedures for dispute settlement. Besides, since the country is a signatory to the Multilateral Investment Guarantee Agency (MIGA) convention, initiated at the 1985 annual meeting of the World Bank, the extra insurance cover for investors, participating in

65

eligible investments in the productive sectors of the country's economy, provides further guarantees for investments against the following:-

- delays in currency transfers if such delays are attributable to the host government;
- expropriation and similar measures;
- breach of contract; and
- war and civil disturbances.

In addition, Ghana has signed Bilateral Investment Promotion and Protection Agreements (IPPAs) with a number of countries to give further protection to investors from those countries. Similarly such agreements would be signed with any other countries that ask for them.

SPECIFIC INCENTIVE PACKAGES FOR VARIOUS SECTORS

1. Agriculture

- (a) Government guarantee of land use for the establishment and operation of the project;
- (b) Permission for importing essential plant, machinery, equipment and accessories required for the enterprise;
- (c) Exemption from payment of customs import duties on plant, machinery, equipment and accessories imported specially and exclusively to establish the enterprise once approved;
- (d) A corporate income tax rate of 45 per cent with the following allowances and deductions:
 - (i) Depreciation or capital allowance on plant, machinery, equipment and accessories to the extent of 100 per cent in the year of investment;
 - (ii) Investment allowance of 10 per cent per annum;
 - (iii) In the case of tree crops and livestock, excluding poultry, an income tax rebate over a three year period to be specified by the Centre at the following rates:
 - 75 per cent in the first year;
 - 50 per cent in the second year; and
 - 25 per cent in the third year.
 - (iv) Exemption of staff from payment of income tax relating to furnished accommodation on the farm.

2. Manufacturing Industries

- (a) Requisite permission for importing essential machinery and equipment required for the enterprise;
- (b) Exemption from the payment of customs import duties in respect of plant, machinery, equipment and accessories imported specifically and exclusively to establish the enterprise once approved;
- (c) Investment allowance of seven and a half per cent;
- (d) Depreciation or capital allowances of 40 per cent in the year of investment and 20 per cent in subsequent years.

3. Construction and Building Industries

- (a) Requisite permission for importing essential machinery and equipment required for the enterprise;
- (b) Exemption from payment of customs import duties on plant, machinery, equipment, accessories (excluding building materials) imported specially and exclusively to establish the approved enterprise;
- (c) Investment allowance of seven and a half per centum per annum;
- (d) Exemption of staff from income tax relating to accommodation provided on building construction site;
- (e) Depreciation or capital allowances of 50 per cent in the year of investment and 25 per cent in subsequent years.

4. Tourism

- (a) Exemption from customs import duties on plant, machinery, equipment and accessories imported exclusively and specifically to establish the approved enterprise;
- (b) Depreciation or capital allowance as follows:
 - (i) plant and machinery - 50 per cent in the year of investment and 25 in subsequent years;
 - (ii) buildings - 20 per cent in the year of investment and 10 per cent in subsequent years;
- (c) Exemption from taxes and rates levied on building properties for a period not exceeding three years;
- (d) Investment allowance of seven and a half per centum per annum.

5. Additional Incentives and Benefits

- (i) In addition to the benefits and incentives mentioned above, where any enterprise with priority status undertakes or supports a programme of scientific research in Ghana approved by the Centre for the purpose of developing or advancing the said enterprise, the capital expenditure in respect of such research is fully deductible.
- (ii) There is a reduction of the company income tax payable:

 - (a) for enterprises situated within Kumasi and Sekondi-Takoradi Metropolitan areas, a reduction of fifteen per centum on the company income tax payable;
 - (b) for enterprises situated within regional capitals other than Accra-Tema metropolitan area, Kumasi, Sekondi-Takoradi and Wa, a reduction of twenty five per centum on the company income tax payable;
 - (c) for enterprises situated in the rest of the country including Wa, but excluding Accra-Tema Metropolitan area, a reduction of forty per centum on the company income tax payable.
- (iii) The Board may grant a reduction or deferment of income tax payable to enterprises located in areas lacking basic infrastructure where the enterprise undertakes the costs of such infrastructure.
- (iv) An enterprise which utilizes Ghanaian labour in preference to imported machinery is entitled to an income tax rebate as follows:

 - (a) in the case of agriculture, where an enterprise employs more than one hundred Ghanaians, to the value of the Social Security contribution payable in respect of every Ghanaian employee in excess of the first twenty;
 - (b) in the case of manufacturing industries, where an enterprise employs more than one hundred Ghanaians, to the value of the Social Security contribution payable in respect of every Ghanaian employee in excess of the first one hundred;
 - (c) in the case of construction and building industries, where an enterprise employs more than seventy-five Ghanaians, to the value of the Social Security contribution payable in respect of every Ghanaian employee in excess of the first seventy-five.
- (v) An enterprise approved under the Code is granted the following benefits as appropriate:

 - (a) establishment or manufacturing licence as appropriate;
 - (b) immigrant quota in respect of the approved number of expatriate personnel;

- (c) personal remittance quota for expatriate personnel from any tax imposed by any enactment on the transfer of external currency out of Ghana;
- (d) exemption from Selective Alien Employment Tax under the Selective Employment Tax Decree, 1973, (N.R.C.D. 201).

Protection of Investment and Transferability of Capital

- (i) Subject to the provision of the Code, an approved enterprise is guaranteed free transferability, through the Bank of Ghana or in the case of the net foreign exchange earnings enterprise, through the external account opened with the permission of the Bank of Ghana in freely convertible currency of:
 - (a) dividends or net profits attributable to the investment of such freely convertible currency;
 - (b) payments in respect of loan servicing where foreign loan has been obtained by an approved enterprise;
 - (c) fees and charges in respect of any technology transfer agreement approved under the Code;
 - (d) the remittance of foreign capital in the event of sale or liquidation of the approved enterprise or any interest in the approved enterprise attributable to foreign investment.
- (ii) Subject to the provision of the Code:
 - (a) no enterprise approved under the Code will be expropriated by the Government;
 - (b) no person who owns, whether wholly or in part, the capital of an enterprise approved under the Code will be compelled by law to cede his interest in the capital to any other person.
- (iii) Where any dispute arises between a foreign investor and the Government in respect of any approved enterprise, all effort will be made through mutual discussions to reach an amicable settlement.
- (iv) Any dispute between the foreign investor and the Government in respect of an approved enterprise which is not amicably settled through mutual discussions may be submitted to arbitration:
 - (a) in accordance with the rules of procedure for arbitration of the United Nations Commission on International Trade Law, or

- (b) within the framework of any bilateral or multilateral agreement on investment protection to which the Government and the country of which the investor is a national are parties, or
- (c) in accordance with any other international machinery for the settlement of investment disputes agreed to by the parties.

An approval of any enterprise may specify the particular mode of arbitration to be resorted to in the case of a dispute relating to that enterprise and such specifications shall constitute the consent of the Government or any agency thereof and of the investor to submit to that forum.

FORMING A COMPANY

The Law regulating the formation of companies in Ghana is the Companies Code, 1963 - Act 179. Any one or more persons may form an incorporated company in Ghana by complying with the Code in respect of registration. The law does not discriminate against foreign nationals in as much as company formation is concerned. However, the business of an incorporated company is guided by three main laws, viz;

- (i) The Investment Code - PNDCL 116, 1985.
- (ii) Minerals and Mining Law - PNDCL 153, 1986
- (iii) Petroleum (Exploration and Production) Law - PNDCL 84, 1984.

Types of Business Enterprises that could be set up in Ghana include:

- (a) Limited Company
- (b) Unlimited Company
- (c) Branch or External Company
- (d) Partnership
- (e) Joint-Venture
- (f) Business Name (Sole Proprietorship)

A. THE LIMITED COMPANY

Often, business entities in Ghana (particularly involving foreigners) are limited companies whose liabilities are limited. A limited company can either be public whereby the public can be invited to buy shares or private in the sense that only private individuals can subscribe to shares issued. An investor can opt for either of these. The private limited company in Ghana is similar to the private limited company of Britain.

THE PROCEDURE FOR FORMING LIMITED COMPANY

Application for registration of a company is made direct or through agents or solicitors to the Registrar General, Registrar General's Department, Post Office Box 118, Accra, Ghana.

A company is duly registered after the company's Regulations have been lodged with the Registrar of Companies and a Certificate of Incorporation issued. A specified fee is paid on presentation of the Regulations. If the Registrar is satisfied that the Regulations presented comply with the provisions for incorporation, a gazetted notice is issued to that effect.

Company Regulations:

The information required is:

- (i) The name of the company with word "Limited" as the last word in the name;
- (ii) The nature of the business which the company is authorised to carry on;
- (iii) A statement that the company possess all the powers of a natural person of full capacity;
- (iv) The names of the first directors of the company;
- (v) A statement that the liability of the company is limited;
- (vi) The Share Capital and its division into shares of no par value;
- (vii) Limitation on the powers of the Board of Directors in accordance with Section 202 of the Company's Code;
- (viii) Any other lawful provisions relating to the constitution and administration of the company.

The requirements for a public company limited by shares are similar to those stated above except to add that the company is a public one and the public can be invited to buy shares.

Commencement of Business:

Before commencing business, further information on the company must be provided. These are:-

- (a) Particulars of the company, and
- (b) Declaration of Compliance.
 - (a) The particulars of the company are given on Form No.3 and signed by the directors and the company secretary. The information to provide is:
 - (i) Name of Company;
 - (ii) Authorised business;
 - (iii) Particulars of directors (at least two) and a secretary;
 - (iv) Name and address of auditors;
 - (v) Address of the company's registered office and principal place of business;
 - (vi) Address at which register of members is maintained;
 - (vii) Amount of stated capital, number of authorised shares of each class, amount of issued shares of each class, amount paid in cash of each

class, amount paid other than cash of each class, amount remaining to be paid on each class.

- (b) The Declaration of Compliance is made on Form No.4. This states that the conditions of Section 28 of the Company's Code pertaining to a minimum capital issue of ₵25,000 has been paid and signed by all directors and secretary of the Company. There is also a stamp duty of ₵10 for every ₵5,000 i.e. 0.2 per cent of capital issue payable. However, under the Investment Code, this can be deferred for a maximum of five years where it is thought necessary. Such deferment must be obtained from the Ghana Investments Centre.

Upon completion and presentation of the forms, the Registrar issues the company with a certificate of commencement of business. Where foreign participation is involved, certificate to commence business is issued with the consent of the Ghana Investments Centre.

Annual Returns:

The company must file annual returns with the Registrar of Companies showing its audited balance sheet and profit and loss statement after 18 months of incorporation.

B. THE UNLIMITED COMPANY

Under the Companies Code, Unlimited companies can be registered with shares, however, all of the company's members would be personally responsible for all the debts of the business. Like a limited company, an unlimited company may be private or public. The Income and Expenditure accounts are presented in place of profit and loss accounts.

The procedure for forming an unlimited company is largely the same as that of a limited company but a statement of share capital is not required.

C. THE EXTERNAL COMPANY

An external company is one formed outside Ghana but has an established place of business in Ghana. This can take the form of a branch management, share transfer, registration office, factory, mine or other fixed place of business excluding an agency except that the agent is authorised to negotiate and conclude contracts on behalf of the outside company.

Within one month of the establishment of the place of business, the underlisted particulars of such companies should be delivered to the Registrar of Companies for registration.

These are:

- (a) A certified copy of the charter (or a translation if not in the English language), statutes, regulations, memorandum and articles or other instrument constituting or defining the constitution of the company.

13

- (b) Statement of the following in duplicate:
- (i) Name;
 - (ii) Nature of business or main objects;
 - (iii) The name, address and business occupation of the "local manager" authorised to manage the business in Ghana of the company;
 - (iv) The number of authorised and issued shares, amount paid and what is remaining payable in cash or otherwise;
 - (v) The address of its registered or principal office in the country of its incorporation;
 - (vi) The address including Post Office Box Number of its principal place of business in Ghana;
 - (vii) The name and address in Ghana of a person authorised by the company, to accept service of process and other documents on its behalf;
 - (viii) Particulars and copies of any charges on the property of the company or if no such charges, then statement to that effect.

On receipt of the documents, the Registrar registers them on the Register of External Companies and the particulars gazetted.

The External Company may invite the general Ghanaian public to subscribe to its shares subject to complying with the requirements of the company code effecting invitations and prospectus as if it were a Ghanaian company. The Registrar however has the discretion to waive or modify parts of these requirements.

Once in a year, at intervals of not more than 15 months, the external company should submit for registration, profit and loss account and balance sheet as in the limited liability return of accounts.

Alterations made in the charter, statutes, regulations and other articles, or other instruments used in registration should be delivered to the Registrar for registration within two months of the effective date of the alteration.

D. PARTNERSHIP

This is the association of two or more individuals to carry out business jointly. A partnership should not consist of more than 20 persons.

Method of Registration:

Incorporation of Partnership is effected when the partnership Form A containing the following particulars is completed and signed by all partners and delivered to the Registrar for registration. A registration fee of a specified amount is paid on presentation of the forms.

74

The information required is:

- (a) Partnership Name;
- (b) General nature of the business;
- (c) Address and Post Office Box number of;
 - (i) Principal place of business;
 - (ii) Other places at which business is carried out;
- (d)
 - (i) Present first name, surname and age of the individuals who are partners in the firm;
 - (ii) Former first name or surname (if any) of each of the individuals who are partners in the firm;
 - (iii) Nationality of each of the individuals who are partners in the firm;
 - (iv) Nationality or origin (if other than above) of each of the individuals who are partners in the firm;
 - (v) The usual residence and any other business occupation (if any) of each of the individuals who are partners;
 - (vi) Particulars of charges on Partnership asset;
- (e) Date of commencement of the business.

The application form is accompanied by a stamped copy of the partnership agreement. The registration is to be renewed once every calendar year.

Proper accounts of the firm are to be kept and at intervals of 15 months, profit and loss account and a balance sheet of the affairs of the firm prepared.

E. JOINT-VENTURES

A foreign investor may join forces with a Ghanaian company for a joint-venture, usually in the form of a limited company. The procedure for registration of company is the same as discussed above. Furthermore, under the Investment Code, 1985, a minimum foreign equity capital of US\$60,000 is required from any foreign investor who intends to enter into joint-venture with a Ghanaian. The foreign shareholders is required to satisfy this either in cash transferred through the Bank of Ghana or its equivalent in the form of goods, plant and machinery, vehicles or other tangible assets imported specially and exclusively to establish the enterprise once approved. The imported items must be covered by the S.G.S. pre-shipment certificate stating the value and condition of the goods. Consideration for goodwill of a business or services rendered by partners cannot be used to satisfy the minimum foreign equity capital.



F. BUSINESS NAME

A Business Name can be registered by only one person under the Registration of Business Names of 1962 (Act. 151).

The requirement for registration is the completion of the relevant Form 'A' contain the following information:

- (a) Business Name;
- (b) General nature of the business;
- (c) Principal place of business;
- (d) All other places (if any) at which business is carried out;
- (e)
 - (i) Present first name and surname;
 - (ii) Any former first name or surname;
 - (iii) Nationality;
 - (iv) National of origin;
 - (v) The usual residence and other business occupation (if any) of the person registering;
 - (vi) Date of Birth.
- (f) Date of commencement of the business.

FURTHER INFORMATION

The various forms required for registration of companies are obtainable from the Registrar General's Department.

Prospective investors should obtain competent professional advice on the type of company which may best meet their needs. Such advice is obtainable from:

- (i) The Chief Executive
Ghana Investments Centre
P. O. Box M.193
Accra, Ghana
- (ii) The Registrar-General
Registrar-General's Department
P. O. Box 118
Accra, Ghana

CORPORATE TAXATION

The Law regulating income tax in Ghana is the Income Tax Decree SMCD.5 1975 as amended. The Decree applies with equal force to Ghanaian and foreign-owned companies resident in Ghana.

In addition to capital allowances which are allowed as deductions in computing trading income, investment allowance amounting to five (5) per centum of the cost of acquisition of any plant or machinery in an industrial establishment is granted. This allowance does not affect the residual basis on which subsequent annual and balancing allowances are to be computed. Like the investment allowance, a sinking fund allowance is also granted at the rate of 10 per centum, provided a sinking fund for replacement of plant, machinery etc., has been set up, a separate bank account opened in Ghana and a sum of money equivalent to the total capital allowances and sinking fund allowance paid into that account in the year of assessment. These allowances are granted for qualifying capital expenditure on investment in plant, machinery, furniture, fixtures and fittings, building (excluding residential property) ships, planes etc. In the case of capital allowance, an initial allowance of 20% is granted in the year in which the capital expenditure was incurred and annual allowances at varying rates also granted in that year and subsequent years. Investment allowances are granted only once in the life-time of the asset but the sinking fund allowance is granted every year provided the necessary conditions are satisfied.

Example:

Machinery costing ₵500,000 is purchased in May, 1985 by a company which prepares its accounts to 31st December each year. The capital allowance computation will be as follows:

- * See additional tax reliefs granted under the Investment Code.

Year Ended 31st December, 1985

		Year of Assessment 1985	
	Cost		₵ 500,000
	Less	Initial Allowance (20%) -	₵ 100,000
		Annual Allowance (10%) -	<u>50,000</u>
			<u>150,000</u>
			<u><u>350,000</u></u>

In this year, the company gets as an allowance against profits:

	(a) Capital Allowance		₵ 150,000
	(b) Investment Allowance (5%) *		25,000

(c) Sinking Fund Allowance (10%)	50,000
	<u>225,000</u>

Year Ended 31 December, 1986

Year of Assessment 1986

	¢
Residual Value B/F	350,000
Less: Annual Allowance (10%)	<u>35,000</u>
Written Down Value	<u>315,000</u>
Total Allowances	
Capital Allowance	35,000
Sinking Fund Allowance	<u>35,000</u>
	<u>70,000</u>

Farming income is exempt from tax in the following instances:

- (a) Tree crops such as coffee, oil palm, sheanuts, rubber and coconut, are exempt from tax during five years following the date of first harvest.
- (b) In the case of livestock, excluding cattle and poultry, for the first five years from the commencement of the enterprise.
- (c) Cattle farming are exempt for tax during the first ten years from commencement.
- (d) Fishing and poultry is exempt during the first three years from commencement.
- (e) Cash Crops such as maize, rice, pineapple, cassava and yam are exempt during the first three years.

REAL ESTATE

The income of a company engaged in the construction, and sale or letting of residential premises is exempt from tax during the first five years following the start of operation.

CARRY OVER OF LOSSES

Companies engaged in the construction and sale or letting of residential premises shall be entitled to carry forward for a further two year period, losses incurred during their period of tax exemption.

REBATE FOR REAL ESTATE DEVELOPERS

Any person other than a company engaged in the construction and sale or letting of residential premises who invest not less than 20% (twenty per cent) of his business profits in the construction of residential premises for sale or letting shall be entitled to offset 50 per cent (fifty per cent) of such investments against his tax liability for the year following that in which the investment was made.

However the maximum investment allowed for tax purposes under this section should be 50% of the business profits of that person.

TAX RELIEFS UNDER THE INVESTMENT CODE

The Investment Code, 1985 (PNDCL.116), also provides numerous tax reliefs for investments in the declared priority areas of agriculture, manufacturing, construction, building industries and tourism.

Projects approved under the Code may enjoy the following reliefs:-

A: Specific Reliefs:

1. AGRICULTURE:

- (a) Investment allowance of 10 per cent per annum (instead of 5%);
- (b) Depreciation or capital allowance deductible at the following rates:
 - (i) Machinery and equipment - 100 per cent in the year of investment;
 - (ii) Buildings and structures - 40 per cent in the year of investment and 20 per cent in subsequent years.
- (c) Income tax rebate of 75%, 50% and 25% for the first, second and third year respectively in activities involving tree crops and livestock.

2. MANUFACTURING:

- (a) Investment allowance of 7 1/2 per cent per annum (instead of 5%)
- (b) Depreciation or capital allowance of 40 per cent in the year of investment and 20 per cent in subsequent years:

3. CONSTRUCTION AND BUILDING INDUSTRIES:

- (a) Investment allowance of 7 1/2 per cent (instead of 5%).
- (b) Depreciation or capital allowance of 50 per cent in the year of investment and 25 per cent in subsequent years.

4. TOURISM:

- (a) Investment allowance of 7 1/2 per cent per annum (instead of 5%)
- (b) Depreciation or capital allowance deductible at the following rates:
 - (i) Plant and machinery - 50 per cent in the year of investment and 25 per cent in subsequent years;
 - (ii) Building - 20 per cent in the year of investment and 10 per cent in subsequent years;
- (c) Exemption from taxes and rates on building properties for a period of up to three (3) years.

B. General Reliefs:

- 1. Deferment of payment of stamp duty for a period not exceeding five (5) years, granted by the Board of Ghana Investments Centre where it is satisfied that it is justified under circumstances prevailing at the time of application;
- 2. Reduction of between 15 and 40 per cent in company income tax payable for locating enterprises in less developed regions;
- 3. Reduction or deferment of income tax payable if enterprise is located in an area lacking in basic infrastructure where cost of infrastructure is undertaken by enterprise;
- 4. Full deductibility for income tax assessment of approved scientific research capital expenditure that would develop or advance the enterprise.

Incentives on Exports

Any person engaged in the manufacturing industry and/or agriculture is entitled to a rebate on his tax liability for any year of assessment if during this period he exports a percentage of his total products for that period. In the case of agriculture, such agricultural produce would be as determined by the Secretary responsible for Trade:

The percentage of products exported and the corresponding percentages in rebates on tax liability are as follows:

Per cent of Total Produce Exported	Rebate on Tax Liability	
	Agriculture	Manufacturing
5 - 15%	30%	40%
15% - 25%	50%	60%
25% or more	75%	75%

20

TAX LIABILITY

Companies resident in Ghana (including foreign-owned companies controlled and managed in Ghana) are all subject to corporation tax on the full amounts of their profits as adjusted for tax purposes.

RATES

The rates of tax differ according to industrial classification:

- | | | | |
|-----|--------------------------------|---|---------------|
| (a) | Companies in Manufacturing | - | 35 per centum |
| (b) | Companies in Farming | | |
| | (See exemption period above) | - | 35 per centum |
| (c) | Companies in Mining | - | 45 per centum |
| (d) | Companies in Commercial Sector | - | 50 per centum |

Corporation tax is assessed at the commencement of each year of assessment (usually January) and the tax is payable within 30 days of the service of the notice of assessment. Corporations may however take advantage of the quarterly payments in arrears and settle their liabilities in four (4) quarterly instalments in March, June, September and December.

WITHHOLDING TAX

Under the Income Tax Law SMCD.5 (as amended), tax is withheld at source and paid to the Commissioner by:

- (a) employers who deduct income tax from salaries and wages of their employees;
- (b) companies including corporations, and other organisations which deduct tax from the directors' fees paid to their directors and board members at the rate of 15%.
- (c) institutions which deduct tax from the part-time teaching fees, examination, invigilation and supervision fees paid by them to part-time teachers and examination invigilators and supervisors at the rate of 15%.
- (d) proprietors and managers of advertisement media who deduct advertisement tax at source at the rate of 15% and
- (e) Ghana resident companies which pay dividend to their shareholders and every person who is responsible for paying interest to any person or any deposit, debentures, stocks, bonds, treasury bills, discounts, annuity or similar payments withhold 15% from such payments which are paid to the Commissioner of Internal Revenue as tax.

The withholding tax of 15% is a final tax and cancels a former method of grossing up, where the tax was a payment in advance.

Accounting Records

Limited liability companies are required by law to keep books of accounts which are to be audited by duly qualified accountants/auditors. The law also authorises the Commissioner of Internal Revenue to give notice in writing requiring a tax payer to keep books and accounts as the commissioner considers adequate. A provisional assessment of a taxpayer who continues to maintain current account records could be done by the Commissioner. Failure to comply with the request of the Commissioner carries with it both a fine and a penalty.

Inventories or Stocks Valuation

Profits to be assessed are based on the full amounts of the profits/margins for the base year. To arrive at the full amount of profits, stocks or inventories are to be valued. The generally accepted basis of valuation is cost, or market value which ever is lower.

Revaluation of Assets

Assets can be revalued at intervals to be decided by the owner. Note must however be taken of the fact that capital allowances which are deductible from assessable income are computed on the cost of the assets to the owner.

Double taxation agreement exists between Ghana and the following countries viz: United Kingdom, Sweden, Denmark, Nigeria, the Gambia and Sierra Leone, Multinational companies would have to be resident in any of the mentioned countries to obtain the reliefs enshrined in the respective agreements. There is also the Commonwealth Development Corporation Concessions regulation (L.I. 623, 1969), similar to the double taxation agreement but applies to only Commonwealth countries.

For further information, please contact:

**The Commissioner,
Internal Revenue Service
Office of the Internal Revenue Service
Headquarters, Kinbu Road
Post Office Box 2202
Accra.**

PERSONAL TAXATION

In Ghana, resident employees and self-employed persons pay tax as required by law. Income tax at specified rates are paid based on assessment made each year by the Commissioner of Internal Revenue.

The Income Tax Law requires the payment of tax on incomes accruing in, derived from, brought into, or received in Ghana in respect of (a),(b),(c),(d),(e),(f) stated below:

- (a) gains or profit from any trade, business, professions or vocation, for whatever period of time such trade, business, profession or vocation may have been carried on or exercised;
- (b) gains or profits from any employment or pension including any allowances or benefit paid in cash or given in kind to or on behalf of an employee or a pensioner other than in respect of medical or dental costs or of any passage from or to Ghana;
- (c) interest or discounts;
- (d) any charge or annuity;
- (e) royalties, premiums and any other profits arising from property, other than rents from property;
- (f) receipts including royalties or periodical or deferred payments of any kind (other than those referred to in Paragraph (e) of this sub-section) derived from any transaction whenever made, affecting directly or indirectly land or any natural resources in Ghana, and notwithstanding whether such receipts paid within or outside Ghana.

All profits derived from Ghana are taxable except where so exempted by law. In the case of non-residents, where a person carried on any trade, business, profession or vocation in Ghana, part of the operations of which may be carried on outside Ghana, the full gains or profits of that business, profession or vocation are deemed to be derived from Ghana.

A basic tax free income is provided which is currently pegged at ₵60,000 per annum. In addition to the basic tax free income allowed, all employees and self-employed persons also have the following reliefs deducted from their income during assessment before being taxed.

- (a) A married man/woman with dependent wife/husband or unmarried with dependent children - ₵6,000.00.
- (b) Children's allowance per child in recognized educational institutions (three (3) children) ₵7,000.00 per child;

- (c) Deductions for life Assurance, Provident Fund and Social Security (maximum) - ₦50,000.00;
- (d) Old age Relief (Over 60 Years) - ₦40,000.00;
- (e) Disablement Relief - 20% of total income p.a.

In addition, incomes listed below are exempted from tax:

- (a) Severance Pay;
- (b) End-of-Year Service Award for employees with not less than ten (10) years' service in any particular employment;
- (c) Bonus of not more than 15 per cent of the basic annual salary of an employee;
- (d) rent allowance of not more than 20 per cent of the employee's basic annual salary;
- (e) night duty allowance;
- (f) pensions;

The law also grants a number of tax incentives and reliefs:

- (a) Tax Holiday for certain new businesses;
- (b) Capital allowances;
- (c) Investment allowances;
- (d) Sinking Fund allowance;
- (e) Exemption of Farming Income (Cocoa only);
- (f) Carry-Forward of Farming Losses;
- (g)

Basic Tax Free Income Relief;

- (h) Life Assurance Relief;
- (i) Provident Fund and Social Security Relief;
- (j) Children's Education Relief;
- (k) Old Age Relief;
- (l) Disabled Persons Relief;

- (m) Export Rebates;
- (n) Married Allowance.

There are supplementary taxes, fees and duties also to be collected. They include:

- (a) Capital Gain Tax;
- (b) Gift Tax;
- (c) Gambling Machines Tax;
- (d) Betting Tax;
- (e) Stamp Duty;
- (f) Entertainment Duty;

- 84 -

- (g) Hotels and Restaurants Registration Fee;
- (h) Hotels and Restaurants Tax;
- (i) Advertisement Tax;
- (j) Selective Aliens Employment Tax;
- (k) Night Clubs Licensing Fees;
- (l) Retailers and Wholesalers Registration Fees;
- (m) Airport Tax;
- (n) Additional Profits (for Mining Companies);
- (o) Foreign Travel Tax;
- (p) Income Tax;
- (q) Mineral Royalties;
- (r) Property Tax;
- (s) Casino Revenue Tax.

INDIVIDUAL TAX RATES FOR 1991 YEAR OF ASSESSMENT

Taxable Income		Rate of Tax		Cumulative
First	¢60,000		Nil	Nil
Next	¢84,000	5%	4,200.00	4,200.00
Next	¢252,000	10%	25,200.00	29,400.00
Next	¢504,000	20%	100,800.00	130,200.00
Next	¢510,000	30%	153,000.00	283,200.00
Next	¢690,000	40%	276,000.00	559,200.00
Exceeding	2,100,000	55%	1,155,000.00	1,714,200.00

The Internal Revenue Service is charged primarily with the responsibility of administering the tax law: Income Tax Decree 1975 (SMCD.5) as amended.

For further information please contact:

The Commissioner
Internal Revenue Service
Office of the Internal Revenue Service
Headquarters, Kinbu Road
Post Office Box 2202
Accra.

CUSTOMS AND EXCISE IN GHANA

The Ghana Customs, Excise and Preventive Service (CEPS) is the government agency responsible for the implementation of Customs and Excise law in Ghana. This includes Import and Export Control, administering of Customs and Excise duties.

IMPORT CONTROL

Imports are generally not controlled in Ghana, where necessary, special permits are required for restricted goods.

Certain items by their very nature are prohibited or restricted. These items are so classified for the following reasons: economic, safety, community health and social policy.

PROHIBITED ITEMS INCLUDE:

- * Infected animals or carcasses
- * Books, indecent or obscene prints and similar articles of a defamatory or demoralising nature
- * Ammunition imported by post
- * Drugs, instruments and appliances injurious to health
- * Meat, vegetables and provisions unfit for human consumption
- * Mercuric based medicated soaps.

RESTRICTED ARTICLES INCLUDE:

- * Animal and animal semen
- * Arms and Ammunition, Explosives
- * Machines for duplicating keys
- * Milk condensed, evaporated or dried
- * Mercury

EXPORT CONTROL

With a few exceptions, there is no control on exports. The main categories of restricted exports are military hardware, antiques and collectors items over 50 years old including works of art. These require special permits and certificates from the Ghana Export Promotion Council and other relevant issuing institutions as a pre-requisite for their exportation, Other items that require permits are, agricultural produce, game and wild life and timber products.

The Ghana Customs, Excise & Preventive Service should be notified by the submission of export entry forms for the compilation of overseas trade statistics.

For goods to benefit from preferential tariff treatment under the General System of Preferences, exporters are required to obtain certificates of origin from the CEPS.

CUSTOMS DUTIES

Generally all imports are subject to customs duties. Exemption for Government, privileged persons, organisations and institutions are allowed where stated by law.

IMPORT DUTIES

Import duty rates imposed on various categories of imports are as follows:

(a)	Unprocessed raw materials	10%
(b)	Other raw materials and capital goods	10%
(c)	Basic consumer goods	20%
(d)	Other goods	25%

Some listed goods are admissible conditionally at concessionary duty rates.

SALES TAX

The standard sales tax value charged on goods is 17.5%. However, various rates apply to different categories of imported goods and these range between 10 per cent and 35 per cent.

Import sales tax is levied on the duty inclusive value. Sales tax on locally manufactured goods is levied on the ex-factory value unless otherwise specifically indicated.

SPECIAL TAX ON IMPORTED GOODS

A Special Tax is imposed on some selected imported goods at various rates. These include some imported goods like garments, alcoholic beverages, cigarettes, etc., which are produced locally. The Special Tax is charged in addition to other taxes.

IMPORT EXCISE (EXCISE DUTY)

The following imported goods attract import excise at the rates indicated:-

(i)	Non-alcoholic beverages	50%
(ii)	Alcoholic beverages	25%
(iii)	Beer and Stout	75.5%/60.5%
(iv)	Cigars, cigarettes and other manufactured tobacco such as snuff	170.5%

VEHICLE TAX

Vehicles of certain brands and rated engine capacities attract 10 per cent vehicle tax. These include:

Petrol operated engine cars exceeding 1600cc

Diesel operated engine cars exceeding 1800cc

Cross country vehicles exceeding 1600cc.

DUTY RELIEF ON TEMPORARY IMPORTS

Duty relief is available for temporary imports for use in Ghana. A security is usually required eg., cash deposit refundable on exportation. This covers a range of goods including transport, professional equipment, goods for display at exhibitions and commercial samples.

SALES TAX CLEARANCE CERTIFICATE

Manufacturers require a Sales Tax Clearance Certificate (STCC) from the CEPS before they can transact the following businesses:

- (a) Clearance of goods from the Ports/Stations.
- (b) Purchasing of materials locally from manufacturers.
- (c) Bidding at the Foreign Exchange Auction.
- (d) Obtaining a Tax Clearance Certificate (TCC) from the Internal Revenue Service.

APPROVED WAREHOUSES

Approved Warehouse facilities exist but duty is rarely deferred.

IMPORT REQUIREMENTS

An import Declaration form from the Ministry of Trade should be completed and filed with the CEPS before importation of goods.

TECHNOLOGY TRANSFER AGREEMENTS:

Under the Code, the Ghana Investments Centre is to approve and maintain a register of all technology transfer agreements which according to the Code's definition include the following:

1. the licensing of foreign patents, trademarks, designs;
2. the assignment, sale and use of foreign patents, trademarks or other industrial property rights;
3. the supply of foreign technical know-how or technical knowledge;
4. foreign technical assistance, design and engineering, consultancy or other technical services in whatever form they may be supplied.
5. foreign managerial, marketing or other services.

Agreements whose duration does not exceed eighteen months are excluded from this regulation.

The objective of approval is to ensure that technology transfer agreements are in consonance with national development priorities, more particularly, it seeks to ensure, among others, that:

- (a) the imported technology is relevant and appropriate to the conditions of Ghana;
- (b) that as far as practicable, Ghana's raw materials, supplies and services are utilized;
- (c) that the imported technology is proven;
- (d) the imported technology is clearly defined in the agreement;
- (e) appropriate training programmes are built into the agreement;
- (f) payments for the technology are fair and reasonable;
- (g) as far as practicable, restrictive clauses such as tied purchases, export restrictions, transfer pricing are minimized.

89