

**BASIC DESIGN STUDY REPORT  
ON  
THE CONSTRUCTION PROJECT  
FOR  
THE FOOD DEVELOPMENT CENTER  
IN THE REPUBLIC OF THE PHILIPPINES**

**AUGUST 1987**

**JAPAN INTERNATIONAL COOPERATION AGENCY**

GRF

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## PREFACE

In response to the request of the Government of the Republic of the Philippines, the Government of Japan has decided to conduct a basic design study for the construction of the Food Development Center and entrusted the study to the Japan International Cooperation Agency (JICA).

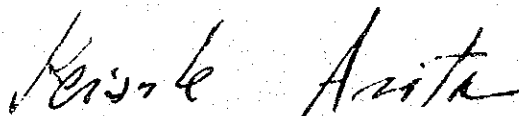
JICA sent to the Philippines a study team headed by Mr. Michimasa Numata, First Basic Design Study Division, Grant Aid Planning and Survey Department of JICA from March 22 to April 9, 1987.

The team had a series of discussions on the project with the officials concerned of the Government of the Philippines and conducted a field survey in Taguig, Metro Manila. After the team returned to Japan, further studies were made, a draft report was prepared and, for the explanation and discussion of it, a mission headed by Mr. Yoshikatsu Nakamura, First Basic Design Study Division, Grant Aid Planning and Survey Department of JICA was sent to the Philippines from June 29 to July 5, 1987. As a result, the present report has been prepared.

I hope that this report will serve for the development of the project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Republic of the Philippines for their close cooperation extended to the team.

August, 1987

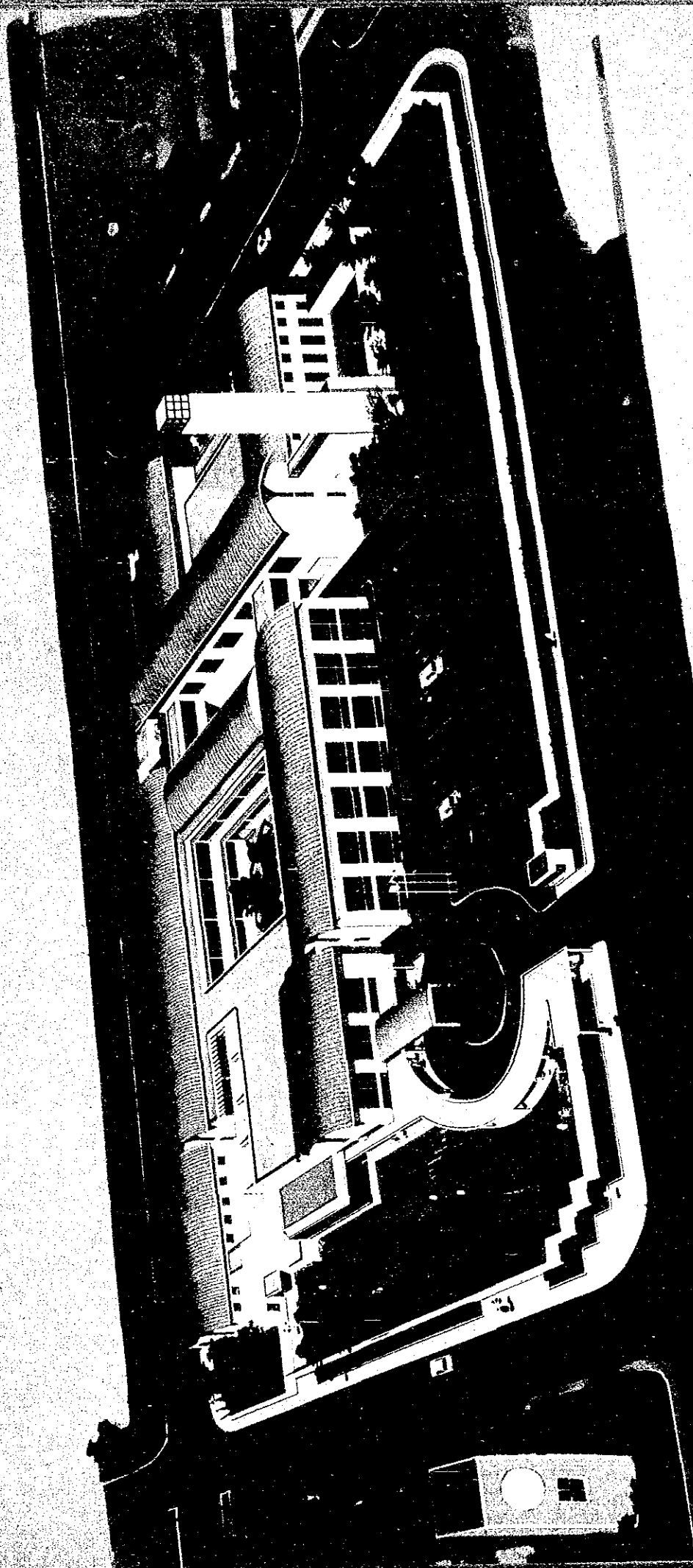


Keisuke Arita,  
President

Japan International Cooperation Agency



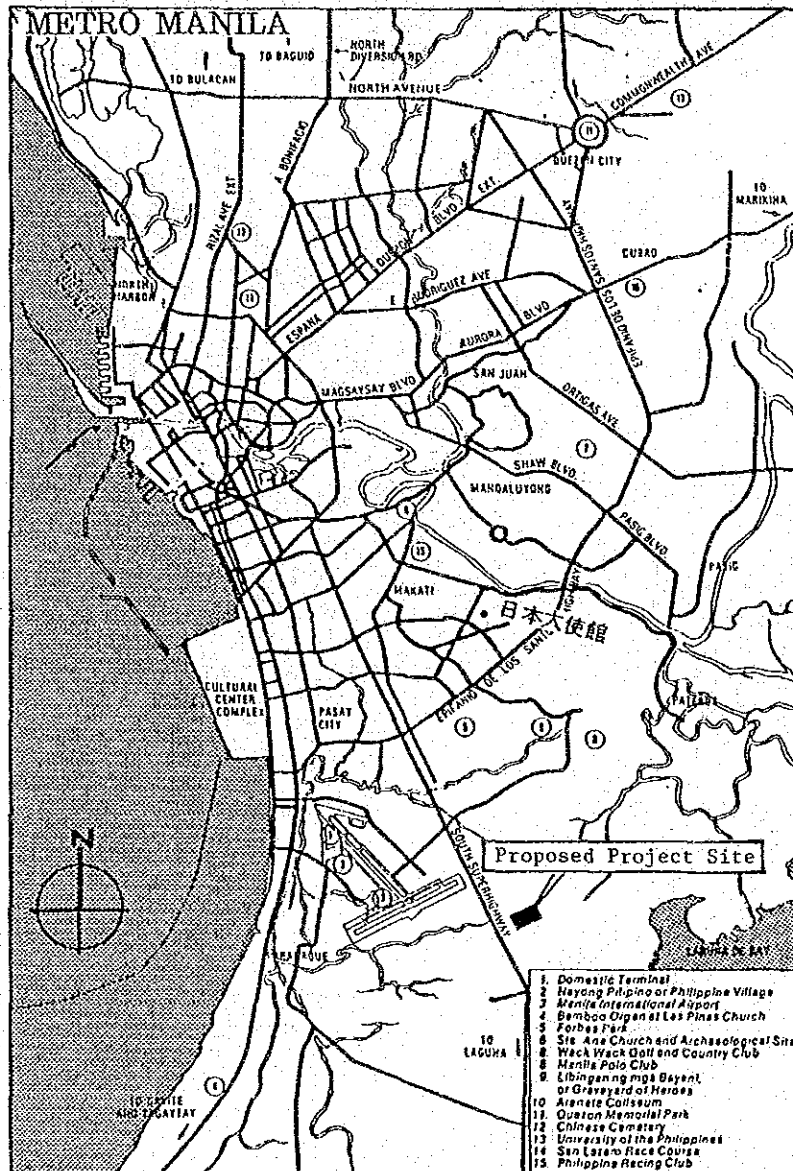
FOOD DEVELOPMENT CENTER



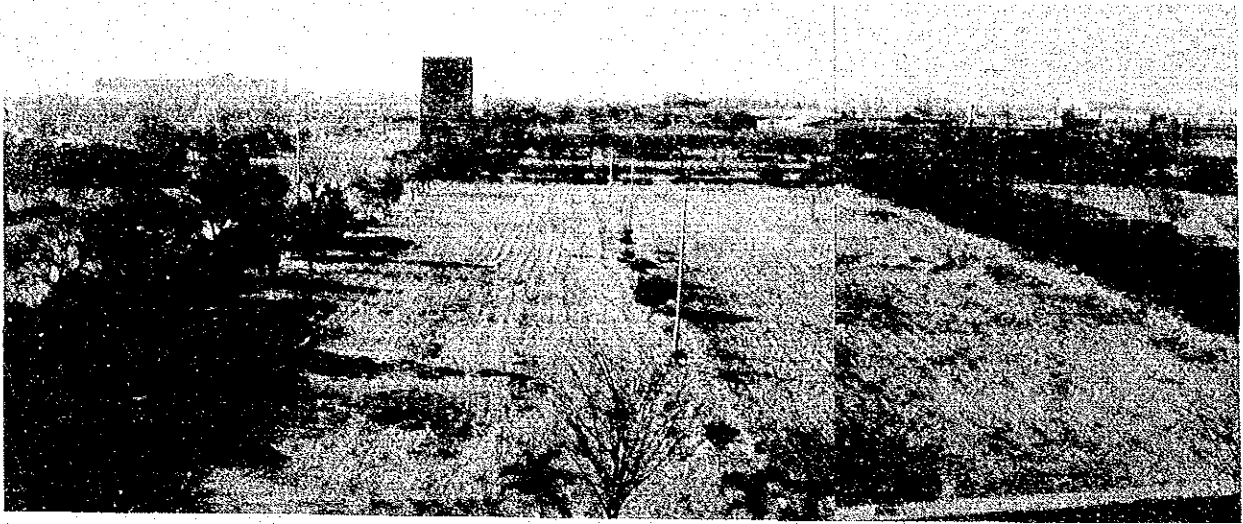




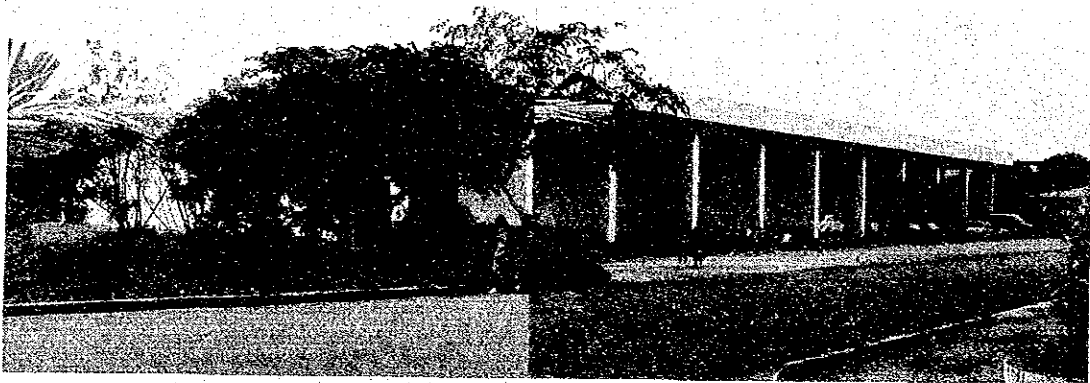
Map of the Location of the Proposed Project Site







Panoramic view of construction site



Outside view of existing FDC

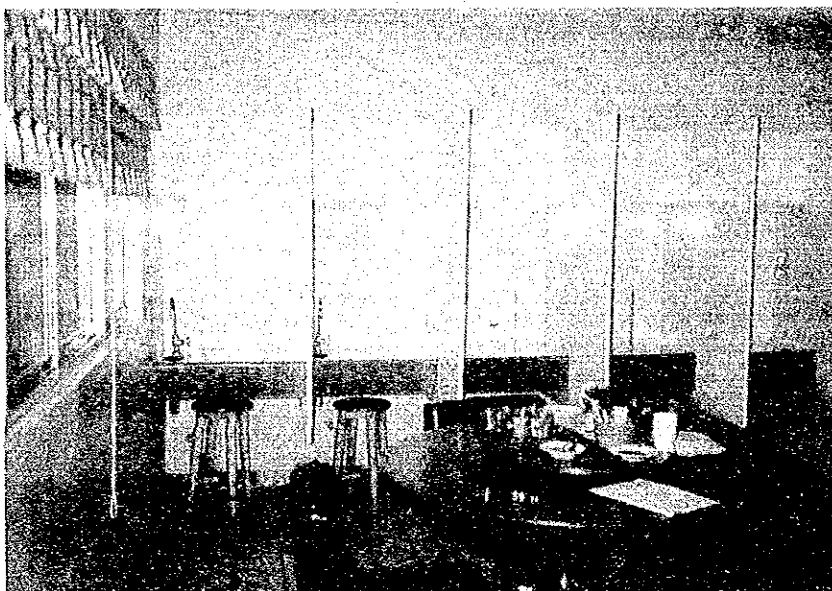


Entrance hall of existing FDC

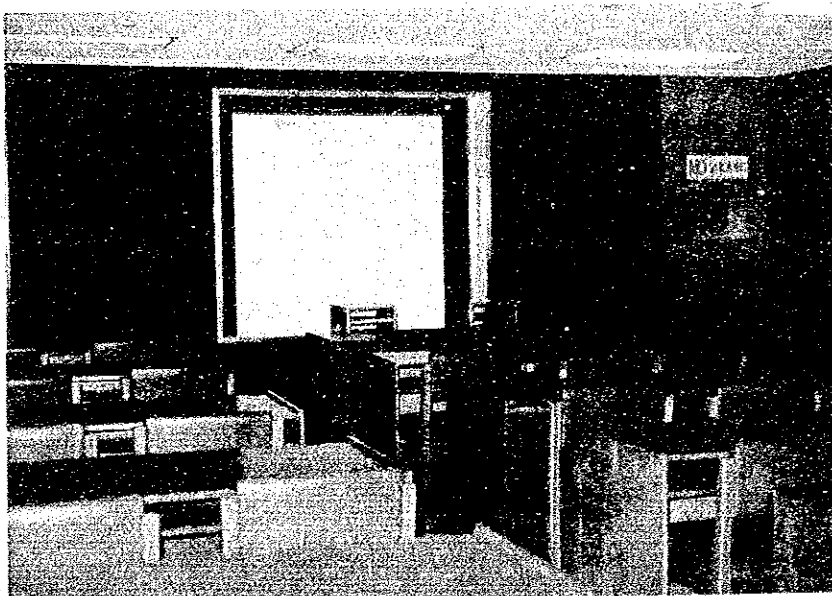




Chemical laboratory of existing FDC



Physical and sensory evaluation laboratory of existing FDC



Training room of existing FDC



## SUMMARY

In the years since 1967, the Government of the Republic of the Philippines has formulated six development plans and exerted every effort to develop the nation economically and socially. The second oil crisis in 1979, however, caused the Philippine economy to suffer a serious setback. The situation has since been further aggravated by years of political confusion triggered by the political unrest which broke out in August 1983, combined with an external debt crisis. In 1984, the Philippines experienced its first negative growth of GNP since independence. The Government of the Republic of the Philippines is now faced with a large current account deficit, a serious budget deficit and rampant inflation. Accumulated foreign debts have also made it difficult to obtain additional loans.

The new administration which assumed power in February 1986 has reassessed economic development policies and in December of the same year announced its Medium Term Economic Development Plan in order to launch economic reconstruction.

The objectives of the Medium Term Economic Development Plan are to increase employment opportunities, alleviate poverty and attain reasonable economic growth.

The economy of the Philippines depends heavily on the agriculture and fisheries sector, which employs 52% of the country's total labor force and accounts for 26% of total GDP. To attain the aforementioned objectives, therefore, the Philippines must endeavor to build an economic base centered on the agricultural and fisheries industries. However, income received from traditional agricultural products, such as sugar, maize and coconut which until only recently had been the Philippines' major export products, has been falling due to the global grain surplus and the drop in prices. As a result, the Philippines are now urged to replace these traditional sources of earnings through the production of new agricultural products and to develop new processing technologies.

Export promotion is important to the Philippine economy because of its close bearing on the nation's foreign exchange earnings, the development of its industry and the creation of employment opportunities.

Especially, the export of agricultural and fisheries products, which account for a fairly high proportion of the nation's net foreign exchange earnings (over 60%) as compared to other export products where over half of export value is taken up by the cost of imported raw materials, is one of the Philippine's economic policies that must be given top priority.

However, the processed foods which the Philippines currently exports are subject to numerous claims from the importing countries. It will be difficult for the Philippines to expand its exports of processed foods if these complaints are not resolved.

The Philippine food processing industry, with the exception of some large enterprises, consists of small and medium scale enterprises which cannot afford to undertake quality analysis and product development. Thus, it is necessary to have such technical services initiated by public institutions. However, the Food Development Center (FDC), which is a subsidiary of the National Food Authority (NFA), is presently the only public institution which provides the private sector with these technical services. FDC is currently offering private food industries such technical support as quality inspection and improvement of mainly export foods, trial manufacture of product samples, establishment of criteria for standardizing quality control on processed foods, technical guidance on quality control and training of employees. Due to the lack of adequate facilities and equipment, however, FDC is restricted in carrying out such technical services as inspection and analysis, quality control, and trial production of samples entrusted by private enterprises. For this reason, the Government of the Republic of the Philippines has formulated a Project to expand and improve the facilities and equipment of FDC in order that it may undertake quality inspection, technology development and sample production on behalf of those small and medium scale enterprises as well as provide them with guidance on quality control. In consequence, the Government of the Republic of the Philippines has requested grant aid from the Government of Japan for the provision of facilities and equipment necessary for the Project.



In response to this request, the Government of Japan dispatched a preliminary study team to the Philippines in November 1986, and upon its recommendations, decided to conduct a basic design study on the project. The Japan International Cooperation Agency (JICA) subsequently sent a basic design study team to the Philippines from March 22 to April 9, 1987.

The study team discussed the contents of request and other matters with the officials concerned of the Government of the Philippines, surveyed the proposed construction site, the conditions of relevant infrastructure development and the local construction situation and collected information and data relevant to the project. Upon its return to Japan, the team developed the basic design for the facilities, selected the necessary equipment and formulated the maintenance and operation plans based on an analysis and study of its survey findings and prepared the draft final report on the basic design study.

With this draft final report in hand, JICA dispatched a team to the Philippines to explain and discuss its contents with the officials concerned of the Government of the Philippines from June 29 to July 5, 1987.

This Project aims to improve and develop activities currently undertaken by FDC. These activities include quality analysis of processed food for export, the development of food processing technology, the diffusion of quality control and the provision of technical service. A sample production division will also be established. The expansion of its facilities and the supply of equipment will enable FDC to improve the extension of the above technical services to the food processing industry.

The proposed project site is located within the FTI complex at Taguig in the southern part of Metro Manila, the National Capital Region of the Philippines. The site is a part of the FTI complex and has an area of about 1.4 ha.

The scale of the overall facilities and outline of equipment determined by the basic design are as follows. The facilities planned under this Project may be roughly divided into two sections namely, the quality evaluation and industry services section and the sample production and development section. The quality evaluation and industry services section will consist of the food science and training building to accommodate laboratories for chemical analysis and various other tests and analysis associated with quality evaluation, training laboratories and training rooms. It shall also incorporate the general administration division and the dormitory building for lodging of trainees and staff. In the sample production and technology development section, the need to haul in raw materials and to haul out sample products and various sorts of wastes will frequently arise. Noise and odor are likely to be generated, so that it will be accommodated in a building of its own, the food technology building.

#### 1. Scale of facilities

* Food science and training building .....	4,649 m <sup>2</sup>	
Office of the Manager and Administration Div. ...	508 m <sup>2</sup>	
Quality Evaluation Div. ....	829 m <sup>2</sup>	
Industry Services Div. ....	837 m <sup>2</sup>	
Public space .....	2,475 m <sup>2</sup>	
* Dormitory building .....	693 m <sup>2</sup>	
Lodging quarters .....	336 m <sup>2</sup>	
Public space .....	357 m <sup>2</sup>	
* Food technology building .....	2,719 m <sup>2</sup>	
Technology Development Div. ....	421 m <sup>2</sup>	
Sample Production Div. ....	1,106 m <sup>2</sup>	
Space for equipment and Common use .....	1,192 m <sup>2</sup>	
Total	8,061 m <sup>2</sup>	

#### 2. Structure

Reinforced Concrete Two Story Building

### 3. Equipment

#### (1) Equipment for quality evaluation

- ..... Fluorescence spectrophotometer
- ..... Gas Chromatograph
- ..... High performance liquid chromatograph

#### (2) Equipment for technology development

- ..... Upright Freezer
- ..... Refrigerator freezer
- ..... Constant Temperature Incubator

#### (3) Equipment for industry services

- ..... Audio-visual equipment for training
- ..... Equipment for preparations of training material
- ..... Training equipment for PTTC

#### (4) Equipment for sample production

- ..... Cabinet dryer
- ..... Vacuum can seamer
- ..... Laboratory freeze dryer

#### (5) Equipment for common use

- ..... Vehicle
- ..... Maintenance equipment

The costs to be borne by the Government of Japan (facilities and equipment) and by the Government of the Philippines such as site clearance, the supply of electricity, water and telephone lines to the site, repair and rehabilitation of sewage treatment facilities, outdoor structural work, planting of vegetation, pond construction, procurement of furniture and furnishings, etc. for implementing this Project are estimated.

The construction period necessary for implementing this Project is considered to be of 17.5 months in total after the Exchange of Notes between the two countries. This can be divided into 3.5 months for execution design, 2 months for tender and contract and 12 months for construction.

The executing body representing the Philippine Government is the National Food Authority (NFA), a subsidiary of the Department of Agriculture. NFA shall be responsible for the execution and administration of this Project and, upon completion of FDC's new facilities, FDC will be positioned as a department of NFA.

The Management Committee whose members will be appointed by the Administrator of NFA will be responsible for making basic policy decisions on all activities of FDC and for monitoring its performance.

FDC is presently a technology development center for food analysis and processing. The expansion of its technical services, especially those related to the export food industry, is expected to have several impacts in developing the food processing industries, increasing employment opportunities, developing local agricultural communities, increasing the inflow of foreign investments and promoting exports of agricultural and fisheries products of the Philippines. For these reasons, the implementation of this Project is earnestly desired.

The following results are expected through the Project:

- \* Prompt execution and diversification of inspection and analysis of processed foods entrusted by private enterprises
- \* Diversification of processed foods through sample production
- \* Improving productivity through guidance on production technology
- \* Improving quality of processed foods through training activities
- \* Reduction in the loss of manufactured products through improvements in the quality control system
- \* Reduction in crop losses through improved post-harvest treatment technology
- \* Manufacturing of processed foods to match market demand through market survey

The implementation of this Project under the grant aid of the Government of Japan is therefore considered to be highly significant and will bring about tremendous benefits to the Republic of the Philippines.

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## ABBREVIATIONS

ADB	Asian Development Bank
AOAC	Association of Official Analytical Chemist
DA	Department of Agriculture
DPWH	Department of Public Works and Highways
E/N	Exchange of Notes
FDC	Food Development Center
FTI	Food Terminal, Incorporated
GDP	Gross Domestic Product
GMP	Good Manufacturing Practice
GNP	Gross National Product
GVA	Gross Value Added
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
MERALCO	Manila Electric Company
MWSS	Metropolitan Waterworks and Sewerage System
NCR	National Capital Region
NCSO	National Census and Statistics Office
NEDA	National Economic and Development Authority
NFA	National Food Authority
NSRI	National Science and Research Institute
NSTA	National Science and Technology Authority
PD	Presidential Decree
PLDT	Philippine Long Distance Telephone Company
PNB	Philippine National Bank
P/Q	Prequalification
PTTC	Philippine Trade Training Center
UP	University of the Philippines
USFDA	United States Food and Drug Administration



## **CHAPTER 1. INTRODUCTION**



## CHAPTER 1 INTRODUCTION

The Government of the Republic of the Philippines, with the inauguration of the new administration, has reassessed its economic development policy and announced the Medium Term Philippine Development Plan 1987-1992 in order to rehabilitate its economy. The goals of the Plan are:

- \* Alleviation of poverty
- \* Generation of more productive employment
- \* Promotion of security and social justice
- \* Attainment of sustainable economic growth

The Government of the Philippines considers the growth and development of agriculture and fisheries, which serve as the backbone of the Philippine economy, to be crucial in attaining the above goals. In consequence, it has formulated and implemented the following basic policies to expand the rural economy and activate the national economy under private industry leadership.

### Basic policy objectives

- (a) To raise small farmers' income;
- (b) To sustain increases in productivity;
- (c) To effect an equitable distribution of the factors of and the returns to production;
- (d) To attain food self-sufficiency and self-reliance for improved nutritional well-being;
- (e) To create and increase agro-based employment opportunities among the rural population, particularly the landless rural workers and subsistence fishermen;
- (f) To improve the delivery system for agricultural crops and commodities, farm inputs, and services; and
- (g) To institutionalize the increased participation of farmers through cooperatives and other farmer organizations.

In the Philippines, where the socioeconomy is sluggish, it is very important for the growth and development of agriculture and fishery is to produce export goods through advanced processing of raw agricultural

and fishery products. This is one of the most important tasks facing the Government of the Philippines in achieving the aforesaid objectives.

In view of the above, not only major food enterprises, but also many small and medium scale food enterprises have lately begun to place emphasis on export foods. Small and medium scale enterprises are faced with numerous problems, however, such as their inability to produce products that satisfy the quality standards of the importing countries. In order to improve this situation, the Government of the Philippines separated the food research department of FII affiliated to NFA in June 1986 and launched it as the Food Development Center (FDC), reporting directly to NFA. Its task is to offer technical support and guidance on the trial production of sample products, quality analysis, quality control of products to be shipped, and quality improvement. The equipment which FDC currently uses for testing and analysis is not only limited but also outdated, however, with the result that it is unable to fully meet the enterprises' requirements. To help solve this problem, FDC exchanged a memorandum with the USFDA last September which authorized it to carry out quality analysis on foods to be exported to the United States and to issue quality certification for them on behalf of the USFDA. Therefore it is expected that the requests of quality analysis of those products will increase in the near future.

In view of the foregoing situation, the Government of the Philippine has formulated a plan to expand the Food Development Center with a view to upgrading the quality of export foods and strengthen their export competitiveness. Under this plan, technical assistance to the private food enterprises shall be extended, and Philippine food exports shall be promoted by providing each enterprise with technical support in export marketing. To help implement this Project, the Government of the Philippines has requested the Government of Japan for grant aid.

In response to this request, the Government of Japan dispatched a preliminary survey team for the grant aid Project in November 1986 headed by Mr. Toshimaru Nakamura to confirm the plan and the contents of the request, to study the Philippine food development policies, executing agency and organization, and to discuss various matters with officials concerned of NFA.

The matters which have been agreed upon are described in the minutes of discussions, the main points of which may be summarized as follows.

1. Project objective

To upgrade the technical level of the Philippine food processing industry by developing food handling methods, production standards, processing technology and a quality control system for foods in order to produce processed foods of exportable quality and thereby promote exports from the Philippines.

2. Specific requests

Construction of a food technology research institute, repairs and improvement of existing facilities and provision of equipment.

3. Project executing agency

The National Food Authority (NFA)

As the contents of the Project were considered to greatly contribute to the development of the Philippine export food processing industry and to further expand the activities which have been performed by FDC, the Team judged the Project to be both realistic and worthwhile.

The preliminary study team determined that the following matters should be given special attention in the basic design study.

1. The formalities for transferring the right of use of the project site from FTI to FDC are still in progress. It will be necessary to check the progress of this transfer.
2. NFA and FDC are still studying whether to remodel and extend the existing facilities or to construct new facilities for this Project, and will advise the Government of Japan as soon as a decision is reached. The progress of their deliberations and the details of their decision should be confirmed.

3. In planning the use of FTT's infrastructure facilities, the independent nature of FDC should be fully considered.

Prior to implementation of the basic design study, NFA informed the Japanese Government that it had reached the following conclusions on items 1 and 2 above.

1. It has decided to change the project site from the initially proposed Lot No.71-C to Lot No.54.
2. As a result of the change in the project site, it decided that new facilities should be constructed for this Project.

As a result of the above, the Government of Japan dispatched, through the Japan International Cooperation Agency, a basic design study team on the grant aid Project to the Philippines in March 1987.

The basic design study team, headed by Mr. Michimasa Numata, First Basic Design Section, Grant Aid Planning and Survey Department of JICA, conducted its field survey for 19 days from March 22 through April 9, 1987.

The basic design study team has confirmed the matters it was asked to study by the preliminary study team and also confirmed that the project would be implemented at the newly proposed project site, Lot No.54. As the facilities plan calls for constructing new facilities, the survey was carried out at the newly proposed site. Matters agreed upon are summarized in the Minutes of Discussions. (Refer to Appendix 4).

This report compiles the results of the basic design study on "The Construction Project for the Food Development Center in the Republic of the Philippines" based on the foregoing surveys and subsequent analysis carried out in Japan.

## **CHAPTER 2. PROJECT BACKGROUND**





## **CHAPTER 2 PROJECT BACKGROUND**

### **2-1 Socio-Economic Conditions and Medium Term Economic Development Plan**

In the years since 1967 the Philippine Government has formulated six development plans on the basis of which it has continued to extensively promote economic development from a long-range perspective. Its industrial and trade policies in the 1970s which included import controls and high tariffs reflected the bias for import-substituting activities which had been encouraged in the early postwar period. These policies, however, tended to overvalue the peso, and although industrial output increased annually at an average rate of 8.0% between 1971 and 1980, these government interventions overprotected certain domestic industries, which created market distortions that discriminated heavily against investments in agriculture and exports, and encouraged the production of finished consumer goods over intermediate and capital goods. Moreover, certain policies that had a capital cheapening bias encouraged investments in large-scale and capital-intensive projects and deterred the optimization of employment generation from limited capital resources. In addition, the archipelagic nature of the country and the inadequacy of infrastructure support in the other regions resulted in the concentration of industrial activities in the National Capital Region and encouraged rural-to-urban migration.

Starting in 1981, the Philippine Government embarked on a medium term structural adjustment program with the objective of transforming the basic structure of industry to a more efficient and world-competitive one, and announced the tariff reform, import liberalization, realignment of indirect taxes, rationalization of the industrial incentives system, sector development programs, and the implementation of major industrial projects. The average normal rate of tariff was brought down from 43% in 1980 to 28% by January 1985, and phased import liberalization was also implemented on some 3,049 items. The Government identified 19 sectors as priority investment areas which should be encouraged.

The full implementation of these policies, however, was derailed by the economic recession that prevailed worldwide as characterized by falling export prices and declining consumption, high interest rates and soaring import prices. And the political unrest in the Philippines in 1983 led to a massive capital flight and a quickly dwindling foreign exchange reserve with growing external debts, and the country's economic growth tended to slow down, as a result of which the economic condition of the Philippines was stagnated, making the implementation of said program difficult.

In view of the foregoing situation, the new regime inaugurated in February 1986 formulated a medium term economic development plan 1987-1992 in December the same year and set the goals of the Development plan for the coming six years to the following:

- \* Alleviation of poverty
- \* Generation of more productive employment
- \* Promotion of equity and social justice
- \* Attainment of sustainable economic growth

The Philippines Government considers the growth and development of agriculture and fisheries which support the Philippine economy to be most crucial in attaining the above goals, has formulated, and is implementing, the following basic policies to expand the rural economies and to activate the national economy under private leadership.

#### Basic policies

- (a) To enhance small farmers' income;
- (b) To sustain the increases in productivity;
- (c) To effect an equitable distribution of the factors of and the returns to production;
- (d) To attain food self-sufficiency/self-reliance for improved nutritional well-being;
- (e) To create/increase agro-based employment opportunities among the rural population, particularly the landless rural workers and sustenance fishermen;
- (f) To improve the delivery system for agricultural crops/commodities, farm inputs, and services; and

- (g) To institutionalize the expanded participation of farmers through cooperatives and other farmers' organizations.

To achieve the above objectives, the Philippines Government decided that the agriculture and fishery division which cover 25 percent of GDP (See Table 2-1-1) will have the highest priority in the development policy. This division earning more than 60 percent of foreign currency by trading, and more than 50 percent of employees are working in this division. (See Table 2-1-2), and when other industry recorded minor growth in GDP during 1983 to 1985, only this division recorded averagely 1.5 percent growth. Therefore agriculture and fishery division was set up 5 percent growth rate in Medium Term Economic Development Plan 1987-1992. (See Table 2-1-3)

However, the traditional export products such as coconut, sugar cane, etc. which had been produced in considerably large quantities in the past came to be produced in just as large quantities by technological innovation in other countries, too, and they suffered a fatal blow in the face of depressed worldwide demand and the drop in international market prices. Their production, as a result, continue to follow a declining trend. So it need the expansion of productivity and technology improvement in food processing and treatment for nontraditional food crops to export instead of them.

The Philippine Government is expressing to find out new market for exporting nontraditional food crops (mango, banana, pine apple and others) and serve the technical services like research and development of postharvesting technology and suitable usage of those crops.

The Philippine Government is trying to serve suitable instruction to the food processing industry to produce export goods which shall meet the standards of importing countries. If this succeed, food processing industry will be able to export a lot of processed food and develop its industry.

Fig. 2-1-1 Composition of Philippine GDP by Industrial Sector, 1976-83

													mill. Peso			
													share %	growth rate %		
	76		77		78		79		80		81		82		83	
Agriculture, forestry and fishery	19,671		20,646		21,620		22,595		23,732		24,608		25,378		24,845	
	27.0	8.0	26.4	5.0	26.1	4.7	25.6	4.5	25.6	5.0	25.6	3.7	25.6	3.1	24.8	-2.1
Industry	24,904		27,544		29,598		32,343		33,471		34,963		35,912		36,048	
	34.1	9.8	35.3	10.6	35.7	7.4	36.6	9.3	36.1	3.5	36.4	4.5	36.1	2.4	36.0	0.7
Mining	1,491		1,742		1,809		2,134		2,236		2,175		2,016		2,082	
	2.0	3.2	2.2	16.8	21.8	3.8	2.4	18.0	2.4	4.8	2.3	-2.7	2.0	-7.3	2.1	3.3
Manufacturing	17,481		19,532		21,108		22,239		23,175		23,959		24,535		25,084	
	24.0	5.7	25.0	11.7	25.4	8.1	25.2	5.4	25.0	4.2	24.9	3.4	24.8	2.4	25.0	2.24
Construction	5,254		5,568		5,913		7,121		7,139		7,830		8,177		7,705	
	7.2	28.1	7.1	6.0	7.1	6.2	8.1	20.4	7.7	0.3	8.1	9.7	8.3	4.4	7.7	-5.8
Electricity Gas Water	678		712		768		849		921		999		1,084		1,177	
	0.9	11.7	0.9	5.0	0.9	7.9	1.0	10.5	1.0	8.5	1.0	8.5	1.1	8.5	1.2	8.6
Service	28,387		29,790		31,579		33,408		35,503		36,613		37,907		39,232	
	38.9	3.4	38.2	4.9	38.1	6.0	37.8	5.8	38.3	6.2	38.1	3.1	38.2	3.5	39.2	3.5
Transportation Communication Storage	3,875		4,335		4,501		4,613		4,827		5,040		5,165		5,328	
	5.3	18.2	5.4	9.3	5.4	6.3	4.9	2.5	5.2	4.6	5.2	4.4	5.2	2.5	5.3	3.2
Commerce	14,999		15,838		16,861		18,085		19,345		19,695		20,355		21,438	
	20.6	-0.4	20.3	5.6	20.4	6.5	20.5	7.3	20.9	7.0	20.5	1.8	20.5	3.0	21.4	6.02
Others	9,513		9,717		10,217		10,710		11,331		11,878		12,337		12,466	
	13.4	4.3	12.5	2.1	12.3	5.1	12.1	4.8	12.5	5.8	12.3	4.8	12.5	4.1	12.5	0.64
GDP (market price)	72,962		77,990		82,797		88,346		92,706		96,184		99,097		100,125	
1972 fixed price	6.7		6.6		6.4		6.7		4.9		3.8		3.0		1.0	

Source : 1983 Philippine Statistical Yearbook, NEDA. 1983 Philippine Development Report, NEDA.

Fig. 2-1-2 Number of Employees in Each Industry

1983 (3rd Qtr.)	Number (in thousands)	% composition
Agriculture, forestry & fisheries	10,187	52.2
Mining and quarrying	124	0.6
Manufacturing	1,833	9.4
Electricity, gas and waterworks	92	0.5
Construction	674	3.5
Wholesale and retail	2,193	11.2
Transportation & warehousing	827	4.2
Finance, insurance & real estate	356	1.8
Social services	3,217	16.5
Others	19	0.1
Total	19,522	100.0

(Source) NEDA: Statistical Year Book 1984

Table 2-1-3 Gross Domestic Product by Industrial Origin, 1986-92  
(In billion pesos, at constant 1972 prices)

	Estimate		Targets					Annual average
	1986	1987	1988	1989	1990	1991	1992	1987-92
Gross Domestic Product	90.0	96.8	103.8	110.8	118.7	126.9	135.3	115.4
Growth rate (%)	0.4	6.7	7.1	6.7	7.1	6.9	6.7	6.9
Agriculture, Fishery, Forestry	<u>26.8</u>	<u>27.9</u>	<u>29.1</u>	<u>30.6</u>	<u>32.2</u>	<u>34.0</u>	<u>35.9</u>	<u>31.6</u>
( ): Ratio in GDP	(29.5)	(28.8)	(28.0)	(27.6)	(27.1)	(26.7)	(26.5)	(27.4)
Growth rate (%)	3.0	4.0	4.5	5.0	5.5	5.5	5.5	5.0

Source : NEDA

## 2-2 General Condition of Agriculture and Fisheries

The Philippine economy is heavily dependent on agriculture and fisheries which jointly accounted for the third share of about 26% GDP in 1984 following service industry and mining and manufacture industry as shown on Table 2-2-1.

Table 2-1-2 tells the importance of agriculture and fisheries in terms of employment which jointly accounted for 52.2% of the total employed population.

The ratio of food exports to total exports is about 33%. Compared to other export products where more than half of their export values are accounted by imported raw materials which make their net foreign exchange earnings small, the weight of agriculture in net foreign exchange earnings may be claimed to be considerably high (about 60%).

Therefore, the role of agriculture and fisheries is very important to reconstruct the Philippine economy.

Table 2-2-1 Composition of GDP (Actual Base) Based on 1972

(Unit: 100Mil Peso, %)

	1982	1983	1984		
	Amount	Amount	Amount	Ratio	Growth
1 Agriculture and Fishery Industry	25,378	24,845	25,141	26.2	1.2
2 Mining Industry	35,714	35,955	32,746	34.1	△ 8.9
A Mining	2,016	1,966	1,589	1.7	△ 19.2
B Manufacture	24,535	25,108	23,732	24.7	△ 5.5
C Construction	8,079	7,689	6,214	6.5	△ 19.2
D Elec. Cass. Water	1,084	1,192	1,211	1.3	1.6
3 Service	37,907	39,268	38,186	39.7	△ 2.8
A Transportation	5,165	5,266	5,019	5.2	△ 4.7
B Commerce	13,103	13,930	14,247	14.8	2.3
C Finance	7,252	7,726	7,255	7.6	△ 6.1
D Service	12,387	12,346	11,665	12.1	△ 5.5
G D P	98,999	100,068	96,073	100.0	△ 4.0

source NEDA; National Income Accounts 1984 Dec.

(1) Agriculture

When crops are listed by the size of cultivated area as of 1985 on the basis of Tables 2-2-3 and 2-2-4, they may be ranked in the order of maize with a cultivation area of 3.31 million ha and production of 3.44 million tons followed by coconut with 3.27 million ha and 2.96 million tons, rice with 3.22 million ha and 8.2 million tons (on the basis of unhulled rice) and sugar cane with 0.4 million ha and 2.75 million tons, respectively.

White corn for the table accounts for most of maize. Although the attainment of self-sufficiency is imminent, its yield per ha is quite low at 1 ton and the productivity is one tenth of Japanese yield. Yellow corn for feed has to be mostly imported which in 1982 reached 250 thousand tons. Both the government and the private sector are trying to increase production of yellow corn by inducing high yielding varieties.

Coconut industry is bringing in more than US\$ 600 million annually through exports, and about a third of the Philippine population earns its livelihood by being directly or indirectly involved in its production, distribution, processing and export.

Production of coconut peaked at 4.5 million tons in 1980 but has been declining since. In 1985 it decreased to 2.9 million tons partly due to the impact of drought. Aging of the coconut trees is a problem, but the task of replacing them with high yielding varieties is making only slow progress.

The Philippines had at one time been compelled to import about half a million tons of rice in the early 1970s due to natural calamities, but since then it has succeeded in increasing production of rice by improving its infrastructure facilities such as irrigation system and roads, and by making varietal improvements and stepping up financing to farmers. In 1977 it

Table 2-2-3 Quantity and Rate of Production 1950-1985

Yield : Metric ton  
Rate of Production : Percent

Crop year	Total yield	Food Crops (Non traditional)										Food Crops (Traditional)					
		Palay (rough rice)		Banana		Mango		Pineapple		Vegetables		Coconut		Sugar Cane		Corn	
		Yield	Rate of production	Yield	Rate of production	Yield	Rate of production	Yield	Rate of production	Yield	Rate of production	Yield	Rate of production	Yield	Rate of production	Yield	Rate of production
1950	4,275.8	2,606.1	60.9	161.4	3.7	27.4	0.6	56.5	1.3	52.5	1.7	846.1	19.8	654.0	15.3	573.7	13.4
1955	6,054.1	3,202.9	52.9	294.8	4.8	50.4	0.8	103.2	1.7	183.4	3.0	1,142.9	18.9	1,546.6	25.5	770.1	12.7
1960	7,315.1	3,739.5	51.1	307.3	4.2	57.6	0.7	133.9	1.8	185.2	2.5	1,117.3	15.2	1,808.7	24.7	1,165.3	15.9
1965	8,478.9	3,992.5	47.1	684.8	8.0	129.4	1.5	176.1	2.0	216.0	2.5	1,533.6	18.0	2,034.0	24.0	1,312.7	15.4
1970	10,670.0	5,233.4	49.0	896.0	8.4	151.7	1.4	233.4	2.1	310.2	2.9	2,012.4	18.8	2,594.6	24.3	2,008.2	18.8
1975	13,743.9	5,909.5	42.9	1,686.0	12.2	239.3	1.7	424.4	3.0	444.6	3.2	2,723.1	19.8	3,287.7	23.9	2,513.9	18.2
1980	21,837.1	7,835.8	35.8	3,977.1	18.2	377.2	1.7	1,280.7	5.8	505.3	2.3	4,570.2	20.9	3,120.8	14.2	3,127.8	14.3
1981	21,748.6	7,722.8	35.5	4,072.9	18.7	366.6	1.6	1,292.7	5.9	502.3	2.3	4,312.1	19.8	3,193.0	14.6	3,109.7	14.2
1982	22,258.7	8,121.7	36.4	4,077.5	18.3	426.3	1.9	1,242.1	5.5	516.2	2.3	3,785.5	17.0	3,402.7	15.2	3,290.7	14.7
1983	20,372.8	7,730.5	37.9	3,885.8	19.0	372.6	1.8	1,682.9	8.2	448.8	2.2	3,381.6	16.5	3,435.6	16.8	3,125.9	15.3
1984	20,858.6	7,840.9	37.5	3,818.9	18.3	378.0	1.8	1,718.9	8.3	476.8	2.2	2,921.9	14.0	3,260.2	15.6	3,346.2	16.0
1985	21,091.7	8,200.1	38.8	3,697.8	17.5	384.3	1.8	1,448.6	6.8	467.2	2.2	2,964.8	14.0	2,747.6	13.0	3,438.8	16.3

\* Vegetables contain onion, potato, cabbage, egg plant, garlic, tomato and others.

Source: NEDA 1986 Philippine Statistical Year Book

Table 2-2-4 Agricultural Area Harvested and Mean Yield, by Kind of Crop 1950-1985

Area : 1,000ha  
Mean Yield : Metric ton/ha

Crop Year	Total Area	Food Crops (Non traditional)										Food Crop (Traditional)					
		Palay (rough rice)		Banana		Mango		Pineapple		Vegetables		Coconut		Sugar Cane		Corn	
		Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield
1950	5,076.2	2,214.0	1.177	97.7	1.652	32.9	0.833	15.2	3.717	20.1	2.612	985.0	0.859	129.5	5.050	909.0	0.631
1955	6,435.3	2,655.5	1.206	167.0	1.765	56.2	0.897	25.9	3.985	97.9	1.873	990.0	1.154	267.7	5.777	1388.4	0.555
1960	7,596.0	3,306.5	1.131	161.5	1.903	52.5	1.097	22.6	5.925	80.7	2.295	1,059.4	1.055	242.2	7.468	1,845.5	0.631
1965	8,252.0	3,199.7	1.248	220.5	3.106	50.6	2.557	30.1	5.850	53.2	4.060	1,604.7	0.956	350.5	5.805	1,922.8	0.683
1970	8,946.6	3,113.4	1.681	235.2	3.810	45.5	3.334	28.9	8.076	62.8	4.939	1,883.9	1.068	366.1	7.087	2,419.6	0.83
1975	10,800.9	3,632.5	1.627	233.3	7.227	46.6	5.135	30.5	13.915	75.3	5.904	2,279.5	1.195	536.1	6.133	3,009.9	0.835
1980	12,133.0	3,636.8	2.155	317.6	12.522	39.2	9.622	62.7	20.426	68.8	7.344	3,125.9	1.462	424.6	7.350	3,201.1	0.976
1981	11,960.8	3,459.1	2.233	311.8	13.063	42.4	8.646	67.0	19.294	66.5	7.553	3,105.3	1.389	421.1	7.583	3,238.7	0.96
1982	12,216.0	3,442.8	2.359	331.4	12.304	41.3	10.322	60.1	20.667	69.3	7.449	3,162.3	1.197	470.8	7.227	3,360.7	0.979
1983	11,639.6	3,239.6	2.386	326.0	11.919	42.5	8.823	62.0	27.148	65.2	6.882	3,187.4	1.061	423.6	8.117	3,157.5	0.99
1984	11,738.2	3,140.7	2.497	317.6	12.024	42.8	8.811	63.0	27.273	65.2	7.241	3,216.1	0.908	479.4	6.801	3,270.2	1.023
1985	11,865.0	3,221.8	2.545	328.2	11.267	45.4	8.465	54.1	26.776	66.1	7.068	3,274.9	0.905	407.1	6.749	3,314.2	1.037

\* Total Area contain other food crops

Source: NEDA 1986 Philippine Statistical Year Book



Table 2-2-5 PRODUCTION OF SELECTED AGRICULTURAL CROPS, PHILIPPINES, 1985-92  
(Calendar Year Basis/In Thousand Metric Tons)

	Actual 1985	Estimates 1986	Projections <sup>p/</sup>						Annual growth rates 1987-92
			1987	1988	1989	1990	1991	1992	
TOTAL CROPS	27,383	27,670	28,699	29,568	30,587	31,831	33,231	34,701	3.9
TOTAL FOOD CROPS	16,623	17,115	17,836	18,358	19,287	20,062	20,937	21,849	4.1
Palay	8,806	9,113	9,431	9,774	10,141	10,510	10,905	11,315	3.7
Corn	3,863	4,016	4,255	4,510	4,781	5,068	5,422	5,802	6.4
Vegetables	342	345	355	359	369	372	383	386	1.7
Sweet potato	778	765	792	808	823	840	856	871	1.9
Cassava	1,690	1,720	1,833	1,904	1,976	2,062	2,146	2,236	4.1
Peanuts	45	45	47	49	51	53	54	56	3.6
Mungbean	27	28	29	30	30	31	33	34	3.2
Other food crops	1,072	1,083	1,094	1,104	1,116	1,127	1,138	1,149	1.0
TOTAL COMMERCIAL CROPS	10,760	10,555	9,961	10,097	10,269	10,514	10,769	11,052	2.1
Coconut	3,113	2,972	1,490	1,900	1,890	1,920	1,954	1,987	0.5
Sugar	1,664	1,503	1,330	1,342	1,349	1,357	1,391	1,426	1.4
Banana	3,705	3,721	4,229	4,318	4,415	4,515	4,616	4,716	2.2
Mango	381	400	419	439	460	482	504	527	4.7
Pineapple	1,490	1,518	1,574	1,602	1,631	1,686	1,715	1,771	2.4
Coffee	135	144	154	164	176	188	200	214	6.8
Cacao	6	7	7	8	8	9	10	10	7.4
Tobacco	60	68	70	74	78	81	86	91	5.4
Abaca	59	69	72	72	73	74	77	80	2.1
Rubber	133	139	152	164	175	187	201	215	7.2
Other commercial crops	14	14	14	14	14	15	15	15	1.5

p. Preliminary.

Source of basic data: MAF, PCA, SRA, PTA and FIDA.

attained self-sufficiency in rice, and since then until 1985 it has been an exporter of rice to Indonesia, Malaysia, Brazil and other countries although the export quantities have somewhat fluctuated. However, the rice yield is still low at 2.5 tons per ha (50 percent unit yield of Japan) and it is still lacking in export competitiveness. The Philippine's tasks since its attainment of self-sufficiency in rice, therefore, have been to increase the yield per unit area and to diversify the crops.

Sugar cane production is greatly affected by the changes in the market price. Due to sustained market depression, production has dropped from a peak of 4.1 million tons in 1976 to 2.7 million tons in 1985. Although the unit yield is on a rising trend, it is far weaker in export competitiveness compared to Cuba and other countries. Also, with the lapsing of the Laurel-Langley Agreement in July 1944, the Philippines must now sell the total production quantity which until then had been delivered in its entirety to the United States under favorable terms and conditions, on its own efforts by seeking outlets in the free market. In the long run, the government intends to replace sugar cane with some other crops.

Describing mainly traditional food crops in above the productivity remain on the lower level except rice because of instability of the market and over production. (See Table 2-2-3)

As the medium-term economic development plan (refer to Table 2-2-5) plans to expand production of non-traditional crops (commercial crops), the agricultural sector intends to step up production of such non-traditional crops as banana, mango and pineapple and to export these as fresh fruits or by processing them into higher value-added products. For this purpose, it is essential to improve the technologies on post-harvest treatment, cultural management and other agricultural techniques and propagate them among the farmers in order to be able to produce stable quantities of better quality crops.

(2) Fisheries

The Philippines has a vast sea area of 2.20 million km<sup>2</sup> and many inland waters consisting of about 340 thousand ha of swamp area, about 220 thousand ha of existing aquaculture ponds and about 250 thousand ha of lakes, rivers and ponds. It is therefore endowed with an abundance of potential fisheries resources.

The present scale of Philippine fisheries may be summarized as accounting for 4.7% of GNP in 1985 and fishery production including inland aquaculture in the same year to have been about 2,052 thousand tons. (Refer to Table 2-2-6 and 2-2-7)

Table 2-2-6 Fishery Production in the Philippines (in 1985)

	Quantity (1,000 Ton)	%	Amount (Bil. Peso)	%
a. Fish Culture	495	24.1	8.7	27.8
b. Small scale Fishery	1,045	50.9	14.7	47.0
c. Commercial Fishery	512	25.0	7.9	25.2
Total	2,052	100.0	31.3	100.0

Source: Philippines Fishery Statistics

Table 2-2-7 Changes in Annual Fishery Production in the Philippines

Year	Quantity (ton)	Increase(%)	Amount (1,000 peso)	Increase (%)
1985	2,052.111	1.36	31,297.268	22.00
1984	2,080.439	1.41	25,649.933	35.13
1983	2,110.230	11.24	18,981.459	26.00
1982	1,896.983	7.00	15,063.966	7.96
1981	1,772.897	6.02	13,953.798	19.83
1980	1,672.254	5.75	11,644.350	10.51

Source: Philippine Fishery Statistics

As shown in Table 2-2-8 on external trade, the 1985 export quantity was about 95 thousand tons and the 1985 import quantity, about 29 thousand tons. This means that only about 5% of total annual fishery production in the Philippines in 1985 was exported while most of the fishery products were consumed domestically, which suggests that fishery products are highly important as a source of protein supply for the people.

Table 2-2-8 External Trade of Fishery Products in the Philippines

(Unit: Ton, Mil peso)

	1983		1984		1985	
	Quantity	Amount	Quantity	Amount	Quantity	Amount
Export	75.588	1,593.0	63.055	2,179.0	94.879	3,488.3
Import	23.038	110.9	6.097	50.3	28.755	118.1
Balance	52.550	1,482.1	56.958	2,128.7	66.124	3,370.2

Source: Department of Fishery Resource

According to the data compiled by the National Census and Statistics Office, the breakdown of major fishery product exports in 1985 was about 23 thousand tons of frozen products such as frozen shrimps and frozen tuna, about 25 thousand tons of canned products mainly consisting of canned tuna and about 29 thousand tons of processed seaweeds. These three items accounted for about 81% of the total export quantity of 95 thousand tons. Salted and dried products accounted for a mere 0.4% of this. The major export items excluding processed seaweeds, which are industrial materials, therefor, overwhelmingly consist of frozen products and canned products.

Among the processed fishery products, it is presumed that fairly substantial quantities of dried products and salt-preserved products are self-consumed at the place of processing. Table 2-2-9 shows the quantities of processed fishery products by form based on the data on distribution.

According to this table, the distributed quantities of dried products and salt-preserved products, when compared against total processed fishery products, are not much different for the quantity of frozen fish which is the mainstay export item as mentioned before, which suggests that most of the dried products and salt-preserved products are domestically consumed.

Table 2-2-9 Changes in Distribution Quantities of Processed Fishery Products

Processed fishery product	(UNIT: TON)						Average(%)
	1978	1979	1980	1981	1982	5 year total	
1. Dried fish	18,961.2	21,673.4	17,822.8	26,551.8	12,207.3	97,216.4	34.3
2. Smoked fish	428.8	441.3	606.1	193.1	209.1	1,878.2	0.7
3. Salt-preserved fish	10,155.2	9,528.7	6,631.7	8,327.7	6,126.5	40,769.8	14.4
4. Dried squid	241.0	112.1	404.7	253.4	52.4	1,063.5	0.4
5. Frozen fish	28,962.3	36,307.6	19,448.8	34,487.9	22,997.7	142,204.4	50.2
総 Total 計	58,748.3	68,063.1	44,914.0	69,814.0	41,592.9	283,132.3	100
Total fishery production	1,580,404	1,581,303	1,672,254	1,772,897	1,896,983		

The Department of Fishery Resources has conducted a survey on the operating scale of the fish processing industries in 1982. A total of 555 manufacturing companies of frozen products, dried products excluding canned products, and smoked products were covered by the survey. According to this survey, the small scale companies with an annual production of less than 5 tons accounted for 62% of the total, the medium scale companies with an annual production of above 5 tons but less than 20 tons accounted for 23%, and the large scale companies with annual production of above 20 tons accounted for 15%. It is difficult to conclude what the overall scale of the Philippine processed fishery product industry is as a whole, but it is at least easy to see that the dried and salted product processing industries are mostly composed of small scale operators.

The ratio of fishery products to total export amount has not changed much since 1970. It ranks fourth place (8%) next to coconut (36%), sugar (20%) and lumber (14); however, under the priority policy measures of the Philippine Government, it is quite likely that the role of fishery products and processed fishery products as items for earning foreign exchange will become increasingly important from now on.

Therefore, technical improvement in Quality Control, Packaging Method and others is indispensable for fish processing industry, and Governmental appropriate technical instructions are needed.

(3) Livestock farming

The Philippines is self-sufficient in pork, chicken and egg, but depends on overseas supply for about 30% of beef and most of dairy products. The latter may be attributed to the delay in developing improved breed of cattle, to the delay in developing the fattening and multiplying technologies as well as to the high feedstock prices, the underdeveloped distribution system, etc. In view of the raising demand for meat, the government is encouraging the attainment of self-sufficiency in feedstock under the Maisagana 99 (maize production expansion program) and the small farmers to engage in livestock farming.

## 2-3 Current Condition and Tasks of the Philippine Food Processing Industry

Although the Philippine economy's degree of dependency on agriculture and fisheries is fairly high, the shares of coconut, sugar, etc. which had traditionally been the leading agricultural products for export in the world market are attenuating due to changes in world affairs, the delay of the Philippines in adapting itself to new agricultural technologies and the technical lag of the food processing industry. It has therefore become necessary for the Philippines to expand the production of such commercial crops as banana, pineapple and mango as well as fishery products as means to expand agricultural and fishery production from now on. However, the domestic market cannot be expected to rapidly consume all of the agricultural and fishery products thus produced. If these products can be processed into products of exportable quality, and if exports of processed food can be promoted, it is quite likely that they will assume an important role in contributing to economic recovery of the country by earning foreign exchange and promoting employment; and it is certain that such an eventuality will greatly enhance the development of the agricultural sector in the Philippines. (Refer to Table 2-3-1).

Table 2-3-1 Changes in Exports of Philippine Foods

	(Units in US\$ Million, on FOB basis)				
	1975=	1980=	1983=	1984=	1985=
Processed fishery products	17	168	132	116	149
Fresh fruits	77	131	127	255	219
Processed fruits	89	117	112	128	131
Vegetables	1	2	3	2	1
Coffee and cocoa	4	64	77	86	80
Sugar	616	659	320	327	288
Coconut	403	695	592	666	316
Others	232	391	278	200	n.a.
Total agricultural and fishery products	1,439	2,227	1,641	1,800	-
Total export value	2,294	5,782	5,005	5,391	4,629

Source: 1985 Foreign Trade Statistics of the Philippines

The actual problem, however, is that despite the fact that the small and medium scale enterprises are receiving many inquiries for their processed foods and dried fruits, frozen fruits and purees for export, they are unable to expand the quantities of these exports because of complaints from the importing countries.



The main export foods of the general food industries in the Philippines are processed fruits, vegetables and fishery products, as enumerated below.

- a. Fresh fruits and vegetables  
(Banana, pineapple, mango, onion, okra, etc.)
- b. Processed fruits and vegetables
  - Frozen fruits and vegetables  
(Frozen pineapple, mango, papaya, okra, etc.)
  - Juices, purees, pastes, jams  
(Juices, purees, pastes and jams of banana, pineapple, mango, papaya and various other fruits or tomato as raw materials)
  - Canned or bottled food  
(canned or bottled products of aforesaid juices, purees, pastes, jams, fruits in syrup, pickles, etc.)
  - Dried fruits and vegetables  
(Mango, papaya, garlic, coffee, pulse crops, spices, flavors)
- c. Processed fish and shellfish
  - Frozen fish and shellfish  
(Shrimp, tuna, squid)
  - Canned fishery products  
(Canned tuna and shellfish)
  - Dried fishery products  
(Dried squid and shellfish)

In order to review the actual status of the Philippine food industry, the typical processed foods, namely, canned foods and dried foods were studied as follows.

1) Canned foods

The Philippine canning industry is characterized by the small number of specialized canning companies. This is because most of them are manufacturers of a variety of other processed foods

as well. They handle not only processed vegetables and fruits but fishery products and meat products. Some of them have even diversified their business by establishing a meat processing department and a slaughterhouse. This is probably because the canned product manufacturers in the Philippines, with the exception of the multi-national big businesses in canned pineapple which boast having the largest production quantity in the world, are unable to make their businesses pay by resorting only to manufacturing of canned products and are compelled to adopt a form of business that integrates the production of many varieties in small volumes. One of the backgrounds that may be related to this is the lack of a stable supply basis for agricultural crops and fishery products which may be used as the raw materials for canning, by which it became necessary for them to generally manufacture various kinds of processed foods with diverse raw materials.

There are not many canned vegetables and fruits in the Philippines that are suitable for export yet, with the exception of canned pineapple. They are, in other words, still underdeveloped. (Refer to Table 2-3-2)

The quality of canned food be affected by the material of can and acid of the contains. So, gilding test, acid test for content and shelf life tests are needed to improve the quality of canned food.

Table 2-3-2 Quantity of Canned Pineapple Exported from the Philippines

Destination	(Units in tons)				
	1976	1977	1978	1979	1980
Canada	7,137	7,706	8,920	10,086	11,407
U.S.A.	96,150	101,922	105,901	121,034	114,106
Hong Kong	1,132	1,655	1,325	1,541	2,423
Japan	3,926	6,323	5,477	7,912	5,084
Belgium	1,437	1,857	3,122	3,516	3,059
Denmark	840	1,062	2,957	767	731
Finland	138	206	873	1,145	3,263
Norway	1,138	1,080	890	1,252	840
France	10	281	2,101	1,557	2,876
West Germany	8,900	12,911	9,448	14,219	15,381
Italy	1,871	1,975	1,707	4,522	6,296
The Netherlands	5,682	4,129	8,943	8,590	7,834
Spain	3,812	4,007	2,108	3,522	3,005
Sweden	2,696	3,251	2,625	5,028	3,859
U.K.	3,197	5,154	3,634	2,265	3,704
Others	270	718	1,605	1,543	3,151
Total	138,335	154,447	161,536	188,609	187,919

Data from "Foreign Trade Statistics of the Philippines", National Census and Statistics Office

## 2) Dried foods

Many of the developing countries are interested in dried vegetables and fruits as a handy means to process agricultural crops, but as an industry, it has not yet emerged from the status of a cottage industry. It is the same in the Philippines although the government is emphasizing the promotion of this industry.

The only dried vegetable which has recorded a sizable export quantity in recent years is onion. Exports of other dried vegetables have only been sporadic.

In the case of dried fruits, dried banana products have been exported in large quantities, followed by dried products of pineapple and mango.

All in all the production and exports of dried vegetables and fruits in the Philippines, except for a few, may be said to have gradually risen when viewed from a long range perspective. There have been some fluctuations, however, from time to time, which may be attributed to such problems as the rise and fall in raw material supply, competition with products of other countries and many others. (Refer to Table 2-3-4)

Especially, package form for dried vegetables and fruits affect the quality and shelf life, so it needs to enforce appropriate quality evaluation and packaging test.

Table 2-3-4 Changes in Exports of Dried Fruits of the Philippines

tons

Destination \ Year		1979	1980	1981	1982	1983
Dried pineapple (057-95-02)	Canada	15.2	39.9	25.0	7.5	14.6
	U.S.A.	—	153.1	62.0	23.9	130.2
	Finland	—	1.0	2.7	2.0	—
	U.K., Ireland	—	3.2	22.1	52.1	16.0
	The Netherlands	—	1.0	—	14.5	—
	Japan	—	—	—	20.8	7.8
	Others	—	4.3	8.3	19.3	11.8
	Total	15.2	202.5	120.1	140.1	180.4
Dried mango (057-97-04)	Canada	1.9	4.0	2.2	2.3	2.6
	U.S.A.	20.7	23.9	34.6	63.5	59.6
	Sweden	—	2.0	2.0	1.0	2.8
	U.K., Ireland	—	1.1	4.7	1.5	0.9
	Singapore	3.0	0.3	1.0	12.0	26.1
	Hong Kong	44.2	42.6	68.1	75.9	93.8
	Hawaii	1.4	0.3	0.1	1.4	0.7
	Others	4.0	4.0	5.2	6.4	16.0
	Total	75.2	78.2	117.9	164.0	202.5
Other dried fruits (057-99-09)	Canada	2.0	27.9	9.6	6.0	14.0
	U.S.A.	0.0	138.3	43.7	43.5	2.5
	Finland	—	1.0	1.1	4.0	—
	U.K., Ireland	—	4.4	32.9	6.0	8.5
	West Germany	—	—	—	11.1	—
	Japan	1.0	4.1	—	13.3	0.5
	Others	2.9	0.0	6.6	20.7	7.7
	Total	5.9	175.7	93.9	104.6	33.2

(Note) Japan excludes Okinawa. The numbers in parentheses ( ) are the tariff classification codes.

As described above, the Philippine food processing industries are still underdeveloped. If they are to be developed, the following problems must be solved.

\* Problems of raw materials .....

Necessity of selecting and improving proper varieties of raw material for processing.

Stable supply and improvement of quality of raw materials for processing

Development of the production base

\* Problems of quality control .....

Necessity to stably supply products of a certain quality standard.

Regulation on food additives, etc.

\* Problems of distribution .....

An efficient transportation system

Storage facilities and storing of products

\* Problems of food sanitation .....

Lack of training in sanitation for the people engaged in food processing

Sanitary problems arising from defective facilities and production equipment

The government's recent emphasis on expanding exports of processed foods and its adoption of preferential measures for the exporting enterprises on matters of tax and finances, coupled with the slowdown in domestic demand have spurred not only the big, and some of the small and medium scale enterprises which have devoted themselves to exports all along but many of the other small and medium scale enterprises to also aggressively engage in exports. The major processors of export foods are equipped with modern processing facilities and quality control facilities; and

they have a staff whose technical level is high. They have their own commercial departments for export, and they export through established overseas marketing channels. Moreover, as many of them have equity relationships or technical tieups with food companies in the United States, Japan or Europe, they are in a position to obtain technical guidance from their respective overseas partners and produce products of a quality which conform to the export specifications. However, the small and medium scale processors who are weak in both capital resources and organization and who account for the majority of the processors in the Philippines have difficulty in establishing their own technologies, such as the following, which are necessary for expanding production and export and which fact is precluding them from improving their export performance.

- \* Technical services necessary for export marketing
- \* Technology for quality inspection, quality improvement and product improvement of export products.
- \* Technology concerning process improvement, process control and quality control
- \* Knowledge and technology concerning improvement of packaging form
- \* Competence in improving the method of gathering and storing raw materials for processing
- \* Competence in developing products for product diversification

The establishment and strengthening of a technical support system by a public institution to make up for the weaknesses of these small and medium scale enterprises is strongly desired by the food industry circles, and is an urgent task for the Government of the Philippines.

## 2-4 Existing Condition of the Food Development Center

FDC was established in June 1986 by the Philippine Government in order to cope with the necessity of implementing quality control and to improve the quality of products exported by the Philippine food industry. It is placed under the following conditions.

### (1) Superior organization of FDC

The predecessor of NFA to which FDC belongs was the Rice and Corn Administration. The National Grain and Industrial Development Act established by Presidential Decree No.4 dated September 28, 1972 created the NGA under the power of the Presidential Proclamation No.1081. NGA was established as the administrative supervisory agency for stabilizing the supply and the price of grain centered on wheat and as the implementing agency of government undertakings (procurement, stockpile, rice polishing, flour milling, distribution, delivery of grain).

NGA was renamed as the National Food Authority - NFA - based on Presidential Decree No. 1770 as of January 14, 1981 and its function, which was also expanded, was to act as administrative supervisory agency for all food industries in general including grain, and also as the implementing agency of associated government undertaking.

According to the new organization chart of NFA (refer to Fig. 2-4-1) announced on November 4, 1986, the Management Council is responsible for deciding basic management policies for NFA, and the Administrator of NFA manages NFA based on those policies. The members of the Council are as follows.

Chairman of the Council	- Secretary of the Department of Agriculture
Members of the Council	- Administrator of NFA
	- Secretary of the Treasury Department
	- Secretary of the Department of Natural Resources
	- Governor of the Central Bank
	- President of the Philippine National Bank

- President of the Land Bank of the Philippines
- Representative of the Office of the President

Jurisdiction over NFA was officially transferred from the Office of the President to the Department of Agriculture (refer to Fig. 2-4-2) by the new regime as of January 30, 1987 and Under Secretary Emil Ong of the Department of Agriculture was appointed as the new Administrator of NFA.

1) NFA's activities

NFA's major functions were originally the following two:

- 1 To function as an administrative supervisory agency for food industries in general including staple grain (rice, wheat, maize)
- 2 To engage in purchasing and supplying of staple grain (rice, wheat, maize) and in supplying foods in general to general consumers

But in line with the economic policy of the new regime whose basic policy is to utilize the vitality of the private sector, NFA's activities of 2 above were cut back in order to place primary emphasis on supervision and administration of stable supply of rice and other staple grain, and in offering technical support to the food industries.

Its specific activities on staple grain are:

- (1) procurement and distribution of grain
- (2) implementation of a grain insurance system
- (3) implementation of the grain financing fund
- (4) establishment of the Post-Harvest Research Institute and provision of extension services.

Its activities on food in general are:

- (1) inexpensive supply of food in general by placing FTI under its jurisdiction
- (2) establishment of directly operated retail shops
- (3) establishment of the Food Development Center



Fig. 2-4-1 NFA Typical Provincial Office Organizational Chart

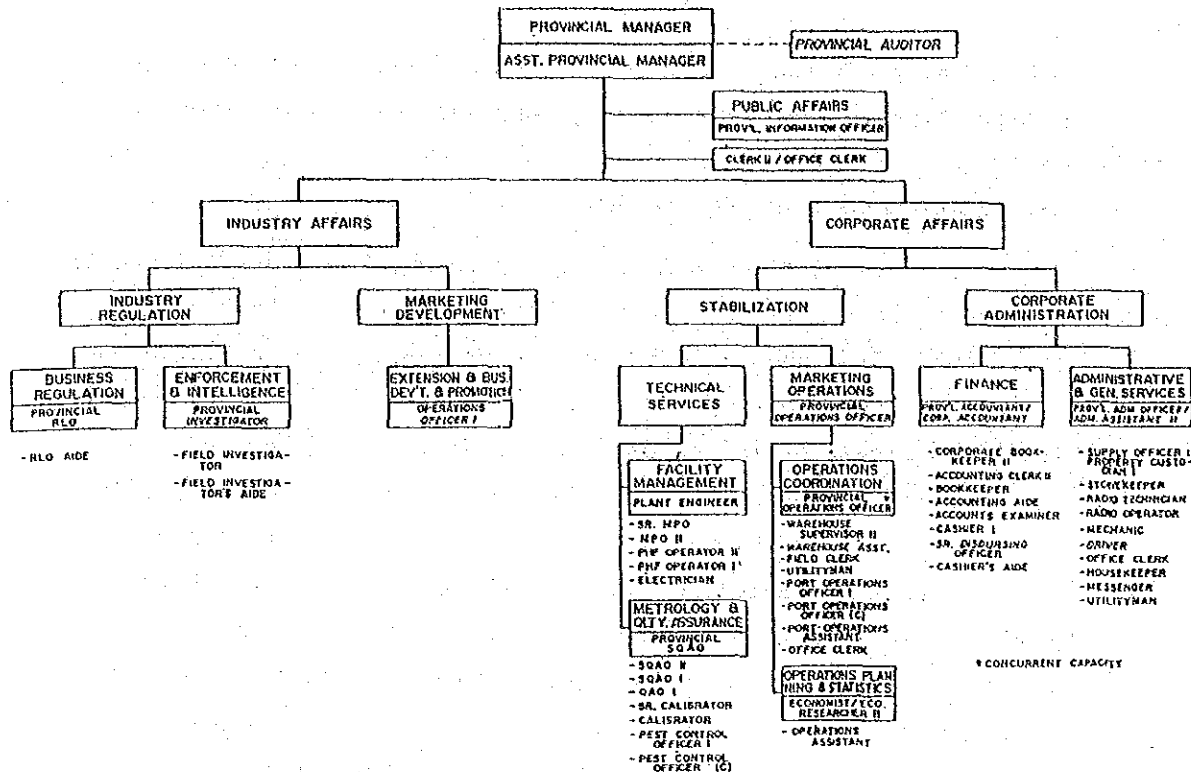
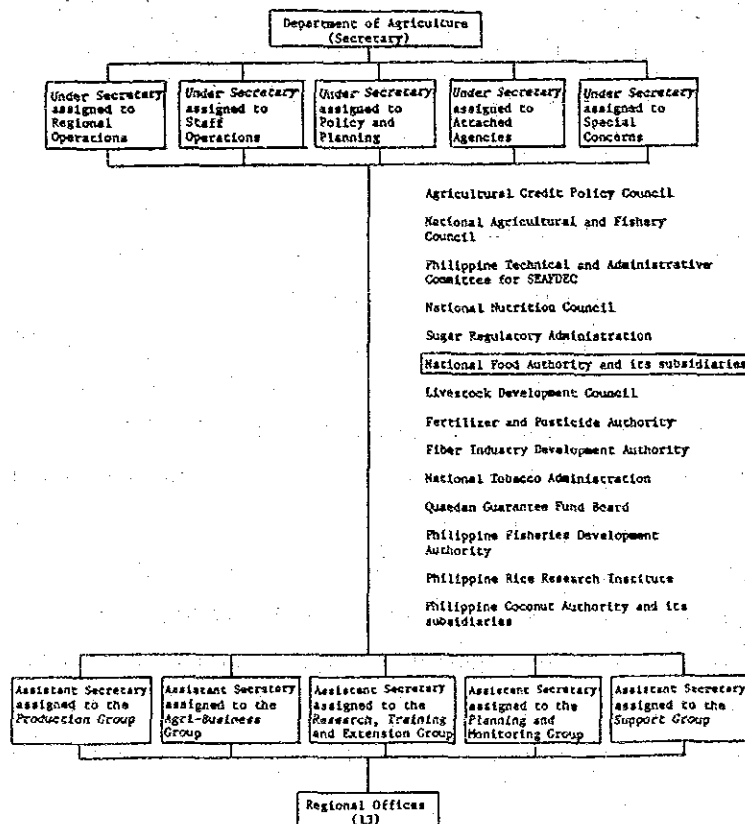


Fig. 2-4-2 Organization Chart of the Department of Agriculture



NFA, however, is now trying to promote the sale of FTI and its retail shops related to food in general to the private sector.

## 2) Relation between NFA and FTI

FTI is a commercial and industrial estate which was established in 1968 with the capital of the Philippine Development Bank on a state-owned land about 120 ha in area at Taguig, Metro Manila under a leasehold agreement with the National Government. It has engaged itself in freeze storing of fresh fruits, vegetables and fish, slaughtering and processing of livestock into meat, manufacturing of processed foods as well as distribution and marketing of foods in general (except staple food like rice, sugar, etc.) including products of other firms, and has placed the FTI Food Research Department, which performed quality inspection, quality control and technical research as technical services for quality improvement of the foods produced or handled by FTI under its supervision.

With the transfer of stock holdings of the Philippine Development Bank to NFA in 1981, FTI became affiliated to NFA, but in line with the economic policy of the new regime whose basic policy is to respect the vitality of the private sector the purchasing and supplying activities of FTI will be cut back in the future while FTI itself will be sold partially to the private sector.

## (2) History of the establishment of FDC

Ever since the establishment of the FTI complex, the new regime, whose policy is to establish and strengthen technical support to the private food industries has had FTI perform quality inspection, quality control and technical research to improve the quality of the foods that it handled, and since 1984 has even more aggressively expanded its technical services by commission of the private food enterprises. NFA separated the FTI's Food Research Division (FRD) from FTI in June 1986 and established it as the Food Development Center (FDC), a public organization to give technical support to the Philippine food industries. Later, a special committee was organized within NFA to let it reassess FDC's activities, organization and manpower assignment, on the basis of

which, on November 4, 1986, NFA established its basic policy on the expansion of FDC, its associated organizational changes, manpower expansion program and operating budget and also clarified the position of FDC as a subsidiary of NFA, and put said policy into effect as of January, 1987.

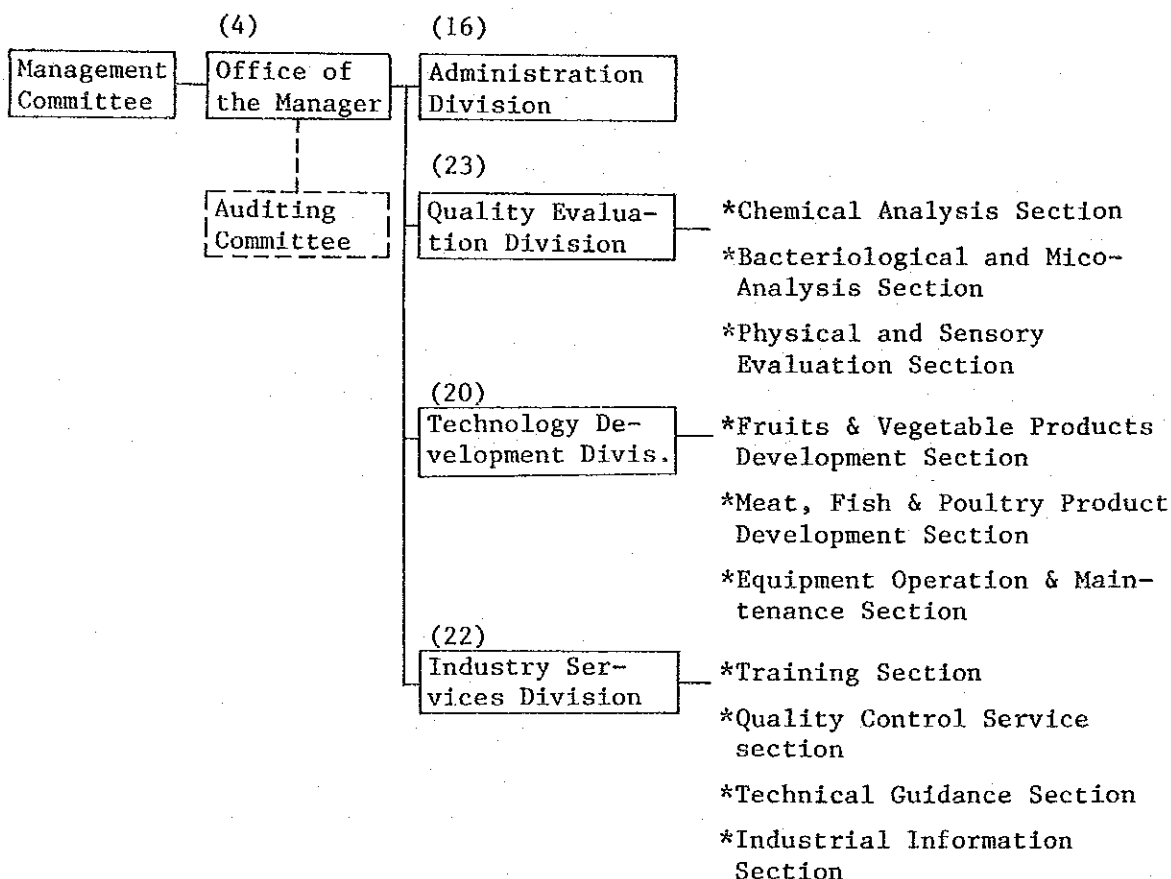
In September 1986, a memorandum was signed by and between NFA and the United States Food and Drug Administration (USFDA), based on which FDC was authorized as an agency to conduct quality analysis on foods to be exported from the Philippines to the United States in lieu of USFDA and to issue quality guaranty documents.

(3) Existing state of FDC

1) FDC's organization

On November 4 of last year the basic plan on organizational changes and manpower increase was approved, and a switch to the new organizational structure was effected this January 1987. The total number of staff working for FDC is presently 56 persons, of which 42 are technical staff (Refer to Table 2-4-1). The personnel will be increased to 85 persons who will be assigned as shown in fig. 2-4-3 after the congressional election in May, 1987.

Fig. 2-4-3 Organization Chart of FDC



( ): Indicates number of staff to be assigned.

By the above, the operating system of FDC as an independent institution will be established.

Table 2-4-1 Existing Staff Allocation of FDC

Division		Technical Staff	Staff	Total
Office of the Manager	Director	1	-	1
	Assit. Director	1	-	1
	Support	-	2	2
	Sub Total	2	2	4
Quality Evaluation Division	Division Chief	1	-	1
	Material Inspection	2	1	3
	Meat Processing Inspection	3	-	3
	Fruit Vegetable Processing Inspection	1	1	2
	Support	-	1	1
	Sub Total	7	3	10
Quality Control Division	Division Chief	1	-	1
	Wet Storage Control	4	-	4
	Dry Storage Control	5	-	5
	Working Space Control	2	1	3
	Sub Total	12	1	13
Technical Service Division	Division Chief	1		
	Physical Sensory Evaluation	6	1	7
	Chemical Analysis	4	1	5
	Microanalysis	2	2	4
	Training and Research for Food Standards		-	3
	Support	-	1	1
	Sub Total	15	5	20
Food Technology Division	Division Chief	1	-	1
	Packaging Lab.	1	-	1
	Product Development	2	1	3
	Processing Technology	2	1	4
	Development Support	-	1	1
	Sub Total	6	3	9
Total		42	14	56

2) Academic background and business career of FDC's technical personnel

Dr. Alicia O. Lustre, Director of FDC, is a graduate of the Department of Chemistry of the Philippine Women's College. She earned her MS degree in chemistry from the Massachusetts State College and her PhD in food science from MIT. After working for the Science and Technology Institute of the National Science and Technology Agency of the Philippines, she joined the Food Research Department of FTI. She has 13 years of working experience. She is also an instructor at the Food Research Institute of the University of Philippines and is appraised highly among the food industry circles as an outstanding authority on food technology in the Philippines.

Ms. Rosabel A. Roncal, Assistant Director of FDC, has graduated both the Department of Agriculture and the Department of Food Technology of the University of Philippines. She earned an MS in food microbiology from the same university. She has worked for the International Rice Research Institute (IRRI) and later joined the Food Research Department of FTI. She has 13.5 years of working experience. She is well versed and experienced in food technology in general, and is particularly authoritative on food microbiology.

All other technical personnel are university graduates (of the Department of Agriculture, Department of Food Technology, Department of Chemistry, Department of Microbiological Chemistry and the Department of Food Dietetics) who may be clasified as follows by years of working experience.

Working experience (years)	No. of persons
10	1
9	1
6	4
5	8
4	6
3	11
2	6
1	2
Total	40

(Note) Includes the number of years of employment with the Food Research Department, FTI.

The technical level of the personnel working for FDC is therefore considered high. Should FDC's facilities and equipment be improved and expanded, there is no doubt that they will contribute to further development of foods in the Philippines.

### 3) Outline of FDC's existing facilities

The building which FDC currently uses exists in a corner of the FTI complex. It was built by FTI 10 years ago originally as a warehouse. It is a one-story, reinforced concrete building with zinc roofing over a steel framed beam. It has a floating foundation and a total floor area of 3,000 m<sup>2</sup> (30m x 50m). This was partitioned approximately at the middle with concrete blocks, and half of it was remodelled into a two-story building for FDC.

The total floor area of FDC is 2,113 m<sup>2</sup>. The first floor is 1,500 m<sup>2</sup> and the second floor, 613 m<sup>2</sup>. FDC's major facilities are as follows.

First floor	Training room	96 m <sup>2</sup> (12m x 8m)
	Quality inspection room	66 m <sup>2</sup> (11m x 6m)
	Reception room	24 m <sup>2</sup> ( 6m x 4m)
	Sensory test room	42 m <sup>2</sup> ( 7m x 6m)
	Product Development laboratory	36 m <sup>2</sup> ( 6m x 6m)
	Packaging test room	30 m <sup>2</sup> ( 6m x 5m)
	Product deterioration and shelf life test room	70 m <sup>2</sup> (10m x 7m)
	Raw material storage	120 m <sup>2</sup>
	Pretreatment and cooking room	69 m <sup>2</sup>
	Spare room	100 m <sup>2</sup>
	Other ancillary facilities	330 m <sup>2</sup>
Second floor	Chemical laboratory	40 m <sup>2</sup> ( 8m x 5m)
	Microbiological laboratory	60 m <sup>2</sup> (10m x 6m)
	Storage laboratory	60 m <sup>2</sup> (10m x 6m)
	Conference room	42 m <sup>2</sup> ( 7m x 6m)
	Director's room & offices	200 m <sup>2</sup>
	Lodging accommodation	10 beds

As these facilities are not large enough to carry out sample production and training services on a full scale, FDC has borrowed food processing and training facilities of about 2,000 m<sup>2</sup> from FTL.

However, as all of the facilities are dispersed, the facilities have difficulty in communicating with each other which is precluding them from taking prompt action.

And three sets of equipment stand idle besides the existing entrance hall of FDC due to lack of space for installing them. This also shows how cramped the facilities are.

#### 4) Equipment held

The list of equipment which FDC has in possession is shown in the Appendix attached here with. NFA has received a project loan from the Asian Development Bank in 1984, a part of which (about US\$360 thousand) has been used by FDC to purchase some of the equipment. Said list includes the equipment purchased by that loan. The equipment are classified by application as follows.

(1) Equipment for chemical analysis and inspection	56 sets
(2) Equipment for microbiological analysis and inspection	18 sets
(3) Equipment for microanalysis and inspection	11 sets
(4) Equipment for physical and sensory testing	13 sets
(5) Equipment for processing tests	25 sets
(6) Equipment for training	3 sets

27 out of the 56 equipment for chemical analysis and inspection were purchased in 1985 which has made this division much better equipped than most divisions, but it is still lacking in many other equipment and apparatus. The equipment which FDC now has for microbiological analysis and inspection and for microanalysis and inspection are quite limited. Six out of the 18 equipment for microbiological analysis and inspection were bought in 1985 or more recently. All of the equipment for physical and sensory testing were bought recently but their types are limited. 18 out of the 25 equipment for processing tests were bought in 1985 or more recently which gives the impression that things have somewhat been improved, but if the processing test function is to be expanded in the future it will still require many more equipment.



On the whole, the types of equipment that FDC has are limited, and if it is to expand its function it will need to have many more analytical and testing equipment. Moreover, as about half of the equipment which FDC now has are old models which were bought in around 1975 they are already poor in efficiency, and some of them are not even operating due to lack of spare parts. The situation being such, the analytical and testing equipment which FDC now has are generally used with high frequency and almost to the limit of their capacity.

FDC hardly has any equipment for training. Information management like data filing is carried out entirely by hand. For preparing training materials and technical guidance materials and for submitting reports to the consigners of tests and research, it uses the conventional typewriters. It does not have a copying machine either. And, as it does not have a car for official uses, such as for visiting factories, its staff must use either the bus or private cars which are inefficient and which greatly restrict their movements.

#### 5) Contents of FDC's activities

The principal technical services which FDC provides are as follows. They are services which have been continued since the days of FTI's Food Research Division.

- \* Quality evaluation tests on export foods entrusted by export food processors and tests of product and quality improvement
- \* Trial production of product samples upon request of the food exporters
- \* Establishment of quality control standards and standardization of food processing
- \* Technical guidance on quality control and employee training for the benefit of enterprises
- \* Voluntary research and development on quality upgrading and product improvement

FDC still continues to provide FTI with routine quality control services as in the past, but the volume of work that it performs for FTI and its voluntary research and development activities together account for approximately 30% of its total volume of work while the remaining 70% consists of technical services to the private enterprises. Of the technical services to the private enterprises, about 60% is for quality evaluation, 25% for tests on product and quality upgrading and 15% for technical guidance and employee training. (The percentages are the ratios of the volume of work.)

Actual performance records for 1985 and 1986 by contents of analysis are shown in Table 2-4-1.

Table 2-4-1 Breakdown of FDC's Inspection Activities

	1985	1986 Jan-Oct	% compared to previous year
Chemical Analysis	323	296	-8.4
Microbiological analysis	392	832	+112.2
Microanalysis (Contaminant analysis)	108	148	+37.0
Sensory evaluation	225	336	+49.3
Physical tests	101	364	+260.4
Total	1,149	1,976	+72.0

When the actual performance record up to and including October 1986 is compared to 1985, the volume of work on the whole has increased by 72%, with increases being particularly remarkable in microbiological analysis and physical tests.

FDC has held seminars and training courses on quality control six times in 1985 and 11 times in 1986 as of the end of October. Of the six seminars held in 1985, four were for training the FTI personnel and two for the benefit of private enterprises, whereas in 1986 ten of the seminars were for private enterprises and only one for the FTI personnel. As these records show, FDC's training courses for private enterprises have remarkably increased since last year.

The number of private food enterprises which FDC now serves is about 110 firms, all of which are medium to small scale food processors. FDC's key staff are making efforts to acquire a grasp of the needs of these business enterprises by visiting each one of them and also making efforts to absorb the requests of the trade circles by periodically meeting with concerned trade organizations. Through these efforts, the position of FDC in relation to the food industry circles is gradually being consolidated. Hence, an increasing number of enterprises are anticipated to seek FDC's technical services in the future.

"A Brief Description of FDC's Operating Performance" (October 1986) is attached herewith.

#### A Brief Description of FDC's Operating Performance (October, 1986)

##### \* Achievements of quality analysis and inspection

###### 1) Chemical Analysis service

Items with high frequency among chemical analysis are total dissolved solids, moisture activity, pH, acidity (by titration), gross protein, salinity, moisture content, gross fat content and saccharinity. Analytical items demanded although with lower frequency are ash, free fatty acid, gross fiber, vitamin C, aflatoxin, soluble benzoate, degree of peroxidation, hardness of water, purity of nitrous acid, chromaticity, chlorine concentration, nitrite, Schick test (aldehydes), anhydrous sodium nitrate and copper concentration.

###### 2) Microbiological analysis service

Items of microbiological analysis are aerobic bacteria count, Salmonella, coliform bacteria, yeast and mold, staphylococcus, holeravibrio (NAC vibrio), thermophilic and mesophilic anaerobic bacteria, flat sour anaerobic bacteria, vibrio enteritidis, every one of which is frequently analyzed.

###### 3) Microanalysis service

The purpose of microanalysis is to analyze light contaminants. Analytical frequency is high.

###### 4) Physical and sensory evaluation tests service

The frequency of sensory evaluation tests is high. The objects of physical evaluation tests are degree of vacuum, dry/net weight, packaging condition, labeling evaluation, cutting test, dimensional measurement and volume measurement, every one of which is tested very frequently.

\* Achievements of Tests for quality upgrading and product improvement and study on process improvement

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1) Themes of tests and studies conducted in 1985</p> <ol style="list-style-type: none"> <li>1 Improvement in techniques for adjusting acidity of fruits in syrup: palm fruits, coconut jelly</li> <li>2 Improvement in techniques for concentrating sugar content and effecting balanced rolling on foods in syrup: jack fruit and banana</li> <li>3 Establishment of quality upgrading techniques on following frozen foods: young-coconut, mature coconut, coconut milk</li> <li>4 Study on techniques for improving chromaticity of following foods: fresh/frozen banana, young coconut</li> <li>5 Instant soybean sauce by hydrolysis of protein</li> <li>6 Development of commercial production technology for mango jam</li> </ol> | <p>2) Themes of tests and studies conducted in 1986 (up to and incl. October)</p> <ol style="list-style-type: none"> <li>1 Technical study on quality upgrading of frozen food: mango, squid fillet, fillet, squid, shrimp</li> <li>2 Tests on improvement in processing technology of canned foods: duck egg, snail for food</li> <li>3 Improvement in techniques for adjusting acidity of palm fruits in syrup</li> <li>4 Improvement in techniques for controlling moisture activity by concentration and balancing of sugar contents of young coconut in syrup</li> <li>5 Study on appropriate method for cold storage of shrimps for export</li> <li>6 Improvement in packaging specifications for frozen and dried food for export</li> <li>7 Tests on physical properties of packaging materials</li> <li>8 Checking and improvement in labeling contents expressing food</li> </ol> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* Trial production of product samples service

- |                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1) Actual works in 1985 (up to and incl. October)</p> <ol style="list-style-type: none"> <li>1 Canned coconut milk</li> <li>2 Frozen foods: coconut milk, pineapple, mango, mixed fruits, mango puree</li> <li>3 Mango pickles</li> </ol> | <p>2) Actual works in 1986 (up to and incl. October)</p> <ol style="list-style-type: none"> <li>1 Frozen foods: banana, young coconut, pineapple, calamansi juice, guava puree, young coconut puree, papaya</li> <li>2 Canned foods: horse mackerel in tomato sauce, mango</li> <li>3 Bottled food: young coconut</li> </ol> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* Guidance on standardization of quality control service

- 1) Foods in syrup: palm fruit, coconut jelly, jack fruit, banana, young coconut red beans and various other pulse crops
- 2) Frozen foods: young coconut, mature coconut, coconut milk, mango, shrimp
- 3) Canned foods: mango, nectar, mango puree, mango
- 4) Soybean sauce
- 5) Candy (to make it long life)
- 6) Purple taro powder (to make it long life)
- 7) Pretreatment method of vegetables for export

\* Seminars and training courses on quality control service

Six times in 1985, of which four times were for FTI and two times for the private sector.

Ten times in 1986, of which one was for FTI and nine were for the private sector.

\* Voluntary research for quality upgrading and product improvement service

1985: on 21 themes  
1986: on 12 themes

(4) Relevancy of FDC with other institutions

1) Relationship with PTTC

PTTC's operating program has been established on the premise that its advanced training courses on inspection of food would be implemented by FDC, and an understanding on this has already been reached between the Department of Commerce and Industry, the executive body of PTTC, and NFA/FDC. Both NFA and FDC have agreed to take over PTTC's training courses, and the related equipment have been requested by FDC.

2) Relationship with the Food and Drug Center

The executing body of said project is the Food and Drug Administration of the Department of Welfare, which is the regulatory administrative authority over health and sanitation of food processing plants and foods. The inspection and analysis which are necessary for the said Food and Drug Administration to carry out its administrative function are the works of the Food and Drug Center. This Center does not have the function to provide enterprises with guidance on quality upgrading, product improvement and quality control or services for evaluating the quality of export foods.

3) Relationship with other institutions

The institutions related to FDC other than the above are:

- NIST (National Institute of Science and Technology)
- Laboratories of UP (University of the Philippines)
- Research Institute of Agro-Industry Division, Department of Agriculture and Food

These research institutes are all engaged in the development of food and research on technology, but their activities are primarily on basic research and not on applied research and development for quality upgrading, product improvement, process improvement, product diversification and application of technologies on which enterprises are seeking guidance. The contents of their studies are also mainly for the benefit of local resource-oriented micro and cottage industries.

FDC maintains close contact with these institutes, and exchanges research data and coordinates research themes with them.

## **2-5 Contents Requested and Preliminary Study**

### **(1) Background of request for this Project**

The Philippine Government is faced with numerous problems, such as its chronic accumulation of foreign debts, high unemployment rate and regional disparities. In its medium term economic development plan (for the 1987-1992 period), it has defined the following as its top priority tasks.

1. Eradication of poverty
2. Increase of employment opportunities
3. Promotion of equity and social justice
4. Attainment of proper economic growth

If agriculture and fisheries on which the Philippine economy is heavily dependent are promoted, the aforesaid goals are likely to be attained to a fairly substantial degree. And, if, order to promote agriculture and fisheries, the currently produced agricultural crops and fishery products can be processed into products that are acceptable to the international market, it is sure to have far-ranging, repercussive effects, such as contributing to foreign exchange earnings with the minimum of investment for the Government, increasing income for the producers and processors, increasing employment opportunities and, moreover, increasing investment from overseas.

The Philippine food industries excepting only a few large enterprises, however, are confronted with many problems in development of new products, quality inspection and quality upgrading, food processing technology, and post-harvesting treatment technology which are problems that cannot be solved by individual

enterprises. It is because of such circumstances that the need to establish and strengthen a technical support system to be offered by some public institute to cover the weaknesses of the small enterprises has become an urgent task. The institute that is capable of undertaking such technical services in the Philippines is the Food Development Center. FDC has exchanged a memorandum with the USFDA last September by which it has been authorized to carry out quality analysis on foods to be exported to the United States and to issue quality certification for them on behalf of the USFDA. It is therefore very likely that requests for quality analysis will increase from now on, but with FDC's current scale of facilities and equipment, it would be impossible for it to take on more work than what they are already doing.

In view of the above, the Philippine Government has drafted an outline of the FDC (See Table 2-5-1) expansion project and requested the Japanese Government for its grant aid for implementing said project.

Table 2-5-1 Outline of the FDC Expansion Project

- \* Project objective : To facilitate the function of this Center by expanding the facilities and equipment of FDC in order to contribute to the development of the Philippine food processing industry.
- \* Project executing body : National Food Authority (NFA)
- \* Proposed construction site : Within the site for FTI complex at Taguig, Metro Manila.
- \* Particulars of planned facilities :
  - : Training and analysis building
  - Training experimental Room, Multi purpose lecture room, Microanalysis laboratory, Chemical analysis laboratory, aflotaxin room, Others.
  - : Lodging building
  - Lodging room. Office room, others
  - : Sample production building
  - Processing room, Freezing room. Quality control system room, others

The plan to remodel some of the facilities in the existing building as recommended in the preliminary study phase was subsequently changed to newly reconstruct them in their entirety.
- \* Particulars of planned equipment :
  - : Equipment for technical experiment (food processing, treatment, packaging, measurement, etc.)
  - Equipment for scientific tests (analysis, physical and sensory evaluation, tests on package, etc.)
  - Equipment for industry services (AV. teaching material preparation, information processing)
  - Others (communication, office work, motor vehicles, etc.)
  - (Refer to Appendix 7)
- \* Particulars of major activities at this Center :
  - : Technical services to private food processing enterprises
  - Quality analysis and tests for quality upgrading and product improvement on food in general
  - Trial production of product samples
  - Technical guidance on quality control, training of employees
  - Establishment of criteria for standardization of quality control in food processing
  - Voluntary research and development on quality and process improvement and product upgrading



(2) Contents of the Project

- 1) The functions of this Center and the contents of its activities as requested by the Philippine Government are roughly as follows.
  - 1 Quality evaluation function
    - \* Preparation of internationally acceptable quality standards on food and offering of guidance on same
    - \* Establishment of internationally acceptable analytical methods on food and offering of guidance on same
    - \* Acquiring a grasp of the medium and small scale enterprises' problems with respect to chemical analysis, microbiology, microanalysis, physical and sensory evaluation and a study of same
    - \* Execution of internationally acceptable chemical analysis, microbiology, microanalysis, physical and sensory evaluation.
    - \* Instructing the domestic enterprises on the application of internally acceptable sanitary and quality control standards on food processing.
  - 2. Technology development function
    - \* Development of technology for treating fresh (perishable) food after harvesting
    - \* Development of a quality control system for export foods
    - \* Development of new processing technology and specifications for food
  - 3. Industry service function
    - \* Implementation of training programs and seminars on quality control for the private enterprises
    - \* Propagating the fruits of the quality evaluation function among enterprises
    - \* Propagating the fruits of the technology development function among enterprises
    - \* Propagating the methods for improving postharvesting treatment technology for fresh food

- \* Providing the enterprises with domestic and foreign food-related information

- 4. Sample production function

- \* Tests on marketability of products and sample production of processed food for the development of the market

2) Contents of building and equipment

Followings are the contents of building and equipment requested by NFA to realize before mentioned function and contents of activity.

- 1. Building

◦ Food science and training building

Installing various kinds of analysis equipment and carry out quality analysis, packaging test and others.

Having training course for small and medium scale enterprises about quality control, food processing technology and others.

- |                            |                              |
|----------------------------|------------------------------|
| * Microanalysis laboratory | * Aflatoxin room             |
| * Chemistry laboratory     | * Training Room (Large x 1)  |
| * Micrology laboratory     | * Training Room (Middle x 2) |
| * Filth laboratory         | * Computer room              |
| * Packaging laboratory     |                              |

◦ Food Technology Building

Installing food processing experimental equipment and carry out the experiment and test for quality improvement, sample production and technical improvement.

- |                                                   |                                     |
|---------------------------------------------------|-------------------------------------|
| * Food processing room 1-2                        | * Self life test room               |
| * Canning steaming room                           | * Postharvest technology laboratory |
| * Freezing room                                   | * Washing room                      |
| * Chiller room                                    |                                     |
| * Fruits, Vegetable Research and Development room |                                     |

Dormitory building

- |                  |             |
|------------------|-------------|
| * Dormitory 1-15 | * Bath room |
| * Laundry        | * Lobby     |

Canteen

- |           |           |
|-----------|-----------|
| * Kitchen | * Canteen |
|-----------|-----------|

2 Equipment

Refer to Appendix 7

(3) Preliminary Study

As a result of its preliminary study conducted in November 1986, the Preliminary Study Team has rendered the following conclusion and brought to attention the following matters which must be confirmed prior to implementing the basic design.

1) Conclusion

As FDC's activities, which are in line with the needs of the industry, cannot be performed adequately by any other institute, this project is likely to contribute greatly to the development of the food industry in the Philippines, particularly the export food industry. What is more, since the activities planned under this project are to further expand the activities which FDC has been actually handling hereto for the project is considered to assume an even more realistic role in this respect.

2) Matters to be confirmed

- (1) As formalities for transfer of the right of use of the site of this project from FTI to FDC were in process, its progress shall be confirmed. Also, as NFA was scheduled to conduct a geological survey of the site shortly, its progress shall be confirmed.
- (2) As NFA was taking steps to transfer the title to the building currently used by FDC and to the FTI's warehouse

which will be used for extension from FTI to NFA/FDC, its progress shall be confirmed.

- (3) As NFA/FDC were studying the alternative plan for extension and remodelling of existing FDC building and wished to present their proposal to the Government of Japan as soon as they have finalized their views, the progress of said study and contents of their proposal shall be confirmed.
- (4) As NFA/FDC were negotiating with FTI and other concerned parties with respect to the supply of electricity and water, the progress of said negotiation shall be confirmed.
- (5) As NFA/FDC were negotiating with FTI as to the possibility of utilizing FTI's drainage treatment facilities, the progress of said negotiation shall be confirmed.
- (6) Specific measures for recruiting technical personnel based on the FDC's manpower expansion program, specific budgetary measures to secure the administrative expenses for FDC, and various other measures to be caused by NFA/FDC to push forward this project shall be reconfirmed.

## **CHAPTER 3. PROJECT CONTENTS**



## CHAPTER 3 PROJECT CONTENTS

### 3-1 Project Objectives

The Medium Term Philippine Development Plan (covering 1987-1992) announced in December 1986 attaches the highest priority to the agricultural sector, including the export agricultural product processing industry, in the hope that it will generate increased earnings through improvement of productivity.

Executive Order No. 116 issued in January 1987 has clarified the tasks of the Department of Agriculture and its organization. It has integrated, and placed the National Food Authority (NFA) under the direct control of the Department of Agriculture and defined its most important mission to be "the development of the food industry".

Following the executive order, the Food Development Center (FDC), which had been a subsidiary of the Food Terminal, Incorporated (FTI), has been raised to the status of a department reporting directly to NFA. By this promotion it has suddenly been brought into the limelight as the central execute organization to carry out NFA's aforementioned task. FDC's task is to establish a system of providing technical support to the food industry of the Philippines whose current problems are to achieve the following.

- \* Reduction of rejections from overseas markets by securing better quality of export products.
- \* Increase in productivity through improvement of postharvest treatment technology.
- \* Improvement in processing and packaging technologies to meet domestic and foreign needs.
- \* Development of new products to meet domestic and foreign needs.
- \* Development of the food industry by providing the food processing industries (particularly the small and medium scale enterprises) with guidance and extension services on the aforementioned matters.

In this project the Government of Japan will provide the facilities required for the sake of expansion of the functions of the FDC in the form of grant aid, every time the said expansion is implemented.

### **3-2 Review of the Contents of the Project**

FDC's current major activities are the establishment of technologies for quality inspection, analysis and improvement of processed foods, provision of guidance on standardization of quality control and offering of seminars and training in quality control, etc. For these activities, FDC now uses a warehouse owned by FTI which was rented and remodelled, and to make up for the shortage of space, it has rented FTI's other facilities, too.

The contents of the project requested at the time of the preliminary study were the extension of currently used facilities and the construction of additional facilities as well as amplification of equipment, but since then, the Government of the Republic of the Philippines has decided to implement the project at a new site and has informed the Government of Japan that all of the facilities must be constructed anew. In view of this, the Basic Design Study Team, upon confirming the change of project site and that all facilities must be newly constructed as a result, has conducted the field survey on the basis of the new construction site.

The Government of the Philippines requests that about 7,500 m<sup>2</sup> of new facilities be constructed on the assumption the altogether about 4,000 m<sup>2</sup> of facilities which FDC now rents from FTI, namely, FDC's current facilities of about 2,100 m<sup>2</sup> in area as well as FTI's other facilities of about 2,000 m<sup>2</sup> in area, shall all be returned to FTI. When FDC's future manpower program and activities program, and its technical support activities for the benefit of the Philippine food processing industries are taken into consideration, the scale of the facilities requested for is considered reasonable.



Judging from the academic background of FDC's technical personnel, their technical level may be highly evaluated. Thus, when the list of equipment requested for are checked in the light of the technical level of FDC's technical personnel, every one of the equipment is considered necessary for FDC's activities and can be used by FDC's current personnel (except the equipment for sample production division). Since the Sample Production Division is a new field which FDC does not cover now, however, manpower with abundant experience in sample production must be secured prior to completion of the facilities.

Some of PTTC's training activities are included in the training program offered by FDC. This is based on the agreement by and between FDC and PTTC that training in food technology such as food inspection and food processing procedure inspection shall be offered by FDC in behalf of PTTC as it would be more effective since FDC is specialized in these matters, and training equipment for this purpose are also included in the equipment requested for.

The items of the request of facilities and equipment to be discussed from the standpoint of appropriateness of the grant aid by taking into consideration the objectives of the FDC are mentioned in the followings.

(1) Examination of the requested facilities

1) Priority of the facilities

The four functions which have been requested for are quality evaluation, technology development, industry services and sample production and their supporting facilities. The current main activity of FDC is quality evaluation, namely, to inspect the quality of export foods, but the idea being advocated is to start placing priority on the amplification of industry services in linkage with the technology development function. This idea is reasonable in the light of NFA's task, which is to develop the food industry, and should be duly considered when planning its facilities and equipment.

2) Basis for determining the scale

FDC's task is to accomplish its national development goal, which is to help attain the Government's Medium Term Development Plan. The scale of the Center was therefore fully discussed on the basis of its current activities and the contents of its existing facilities and equipment and by taking the Center's future manpower program and activities plan into full account. In connection with the training program, FDC is planning the staffing scheme by regarding 1992, which is the year of completion of the Medium-Term Economic Development Plan, and therefore the scale of the training facilities and the like will be determined by taking into consideration the training program for 1992.

3) Quality inspection laboratory

The request referring to the laboratories for quality comprises such items as microbiological inspection laboratory and elements related to clean room and biohazard, such as aflatoxin inspection laboratory, but it must be borne in mind that the facilities in question are intrinsically aimed at carrying out inspection. Under the circumstances, it is regarded as appropriate to draw up the plan by taking into consideration mainly substantial facilities aimed at practical use for the sake of routine work, by taking into consideration the difficulty of maintenance and control of too much sophisticated facilities in the Philippines.

4) Sample production laboratory

As things now stand, the FDC is not equipped with this facility. Nevertheless, the FDC is carrying out such activities as sample product, preparation of samples for export of food, training courses on food processing, etc. It must be borne in mind, however, that from the sanitary standpoint the facilities of the FDC are by no means qualified to become a model case for private enterprises in connection with the subject of food processing. Under the circumstances, when designing this facility it is indispensable to adopt convenient layout and detailed design of the various rooms so as to facilitate the maintenance and control from the sanitary

standpoint. Furthermore, it is also necessary to carry out routine washing and sterilization so as to become the model for small and medium scale food processing industries of the Philippines.

5) Training room

One large training room and two medium training rooms will be required according to the request proposed in connection with the training program. The large training room will have capacity to accommodate 150 through 200 persons, and it is presumed that the maximum scale of each group of the training program will be of the order of 150 persons. On the other hand, it is presumed that the number of trainees to gather on the occasion of the opening lecture to be delivered by the superintendent and other similar occasions is of the order of 3 groups of 50 persons. Therefore, it is regarded as appropriate to build the large training room as a multi-purpose training room with capacity for 150 persons. On the other hand, multi-purpose training should be properly equipped so as to make it possible to use the space for such purposes as exhibition of sample products, announcement of processing techniques and fabrication processes, etc.

As for the medium training room, it is regarded as appropriate to build 2 rooms with capacity for 50 persons each in view of the current state of thing of the implementation of seminars.

6) Training room for the PTTC

At the beginning, it was being planned to use the quality inspection laboratory of the FDC as a training facility of the PTTC, but it was concluded that the use of the quality inspection laboratory for training purposes is not appropriate because that laboratory is aimed at carrying out the inspection of samples of the various companies. On the other hand, it must be remembered that the FDC strongly demanded to use the laboratory that way. Under the circumstances, the PTTC will be provided with two training rooms with capacity for 20 through 25 persons for its exclusive use, one for the biological section and one for the chemical section.

7) Dormitories

The dormitories will be used for 2 purposes, for the research and inspection staff to take a nap when their work goes deep into the night and for trainees coming from the provinces to lodge in. As for the appropriateness of the capacity for 30 persons mentioned in the request, we have learned that as things now stand there are facilities of this kind with capacity for 10 persons in the FDC that are being used for the former one of the said purposes. It must be borne in mind, however, that the existing facilities being used by the FDC will be returned to the FTI which is the owner. On the other hand, it must be remembered that after 1992, when the training programs will be implemented in full scale, it will be necessary to permanently deal with more than 100 trainees, with 20% through 30% of them coming from the provinces. Therefore, the dormitory capacity for 30 persons mentioned in the request can be regarded as appropriate.

(2) Examination of the requested equipment

1) Quality inspection equipment

The quality inspection function consists mainly of carrying inspections of various kinds with food samples taken by companies. As a result of a memorandum exchanged with the USFDA, the USFDA was allowed to carry out inspections with the object of omitting the sampling inspection of processed food which was being taken charge by the FDC. As can be seen, proper inspection methods are required to cope with the standards of the destination country of the exports. As things now stand, the equipment of the FDC is insufficient, and an urgent improvement is required in this connection. The fulfillment of international standards, such as those ones adopted by the USFDA and AOAC the like must be taken into consideration when selecting the equipment to be provided anew. Moreover, the equipment will be selected by taking into consideration the ease of maintenance and control and the appropriateness for general-purpose use. Under the circumstances, the equipment to be provided will consist mainly of the priority AA of the list mentioned in the request (Refer to Appendix 7). There

are such items as the FMC BURST TESTER in the Priority AA of the list contained in the request, however, that can be substituted with the POUCH BURST TESTER, and therefore it is regarded as appropriate to omit it.

2) Equipment for sample product and technical development

As things now stand, equipment of this kind of the FDC consists of one freezer, food cutter, food mill, smoking house, canning machine, can splicer, etc., and a substantial expansion will be required. The criteria for selection of the equipment will be basically aimed at small-sized multi-purpose equipment suited for batch processing because the object of this project consist mainly of guidance to small and medium scale indutry and the sample of products. At the beginning the FDC was asking for state-of-art equipment such as belt freezer type quick freezing equipment, but we succeeded at coming to terms regarding the aforementioned criteria as a result with further discussions with the FDC. Therefore, the list of equipment mentioned in the request presented on the occasion of the basic design survey is regarded as generally appropriate.

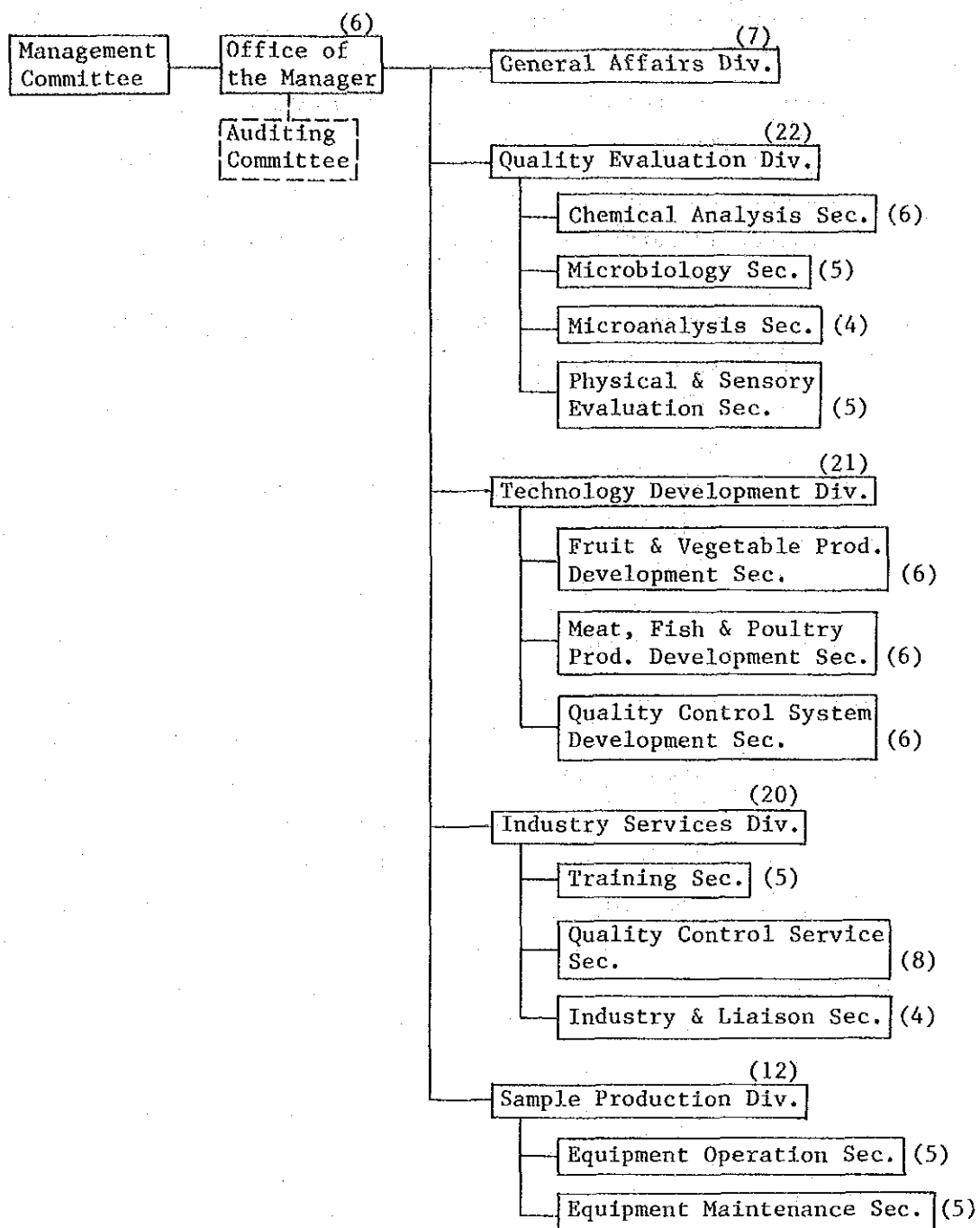
### 3-3 Outline of the Project

#### 3-3-1 Executing agency and operating system

Practical affairs concerning this project shall be carried out by the Implementation Committee (established in November 1986) and organized of nine responsible officers of relevant departments of NFA (including the Director of FDC). The Special Assistant of the Special Operations and Coordinating Office shall assume the chairmanship of the Implementation Committee and issue instructions on the necessary works relating to this project, and coordinate matters with the authorities concerned.

Decisions on basic policies for all of FDC's activities and auditing shall be the responsibility of the Management Committee composed of members appointed by the Administrator of NFA. FDC's operation and administration shall be performed under the supervision of the aforesaid Management Committee by the Director and Assistant Director of FDC and by the five divisions organized below them, namely, the existing General Affairs Division, Quality Evaluation Division, Technology Development Division, Industry Services Division and the newly established Sample Production Division and their section. Altogether 12 Sections are planned, and the total numbers of staff is scheduled to be 98 persons for the time being. The Equipment Operation Section of the Sample Production Division will hire about 20 temporary workers at the time of trial production of sample products. (See Figure 3-3-1)

Figure 3-3-1 FDC Organization Chart



Total 98 persons