

## **CHAPTER 8**

# **CONCLUSION AND RECOMMENDATIONS**



## CHAPTER 8 CONCLUSION AND RECOMMENDATIONS

### 8-1 Conclusion

This project is believed to contribute to efficient utilization of water resources by the improvement of diversified crops irrigation technology and the training of engineers. It will be significant for national development and a stable economy. This project is therefore regarded worth realizing through grant aid from the government of Japan, with considerable cooperation benefits.

### 8-2 Recommendations

The following recommendations are presented for the prompt realization of the project as well as the smooth and effective operation of the Center to accomplish its objectives.

#### (1) Administration of Research and Training

##### 1) Training of the Instructors

The NIA will need to provide systematic research and training in diversified crop irrigation engineering. Thus, it is recommended that specialist instructors be selected from the experienced staff in order to establish a stable research and training system with cooperation from JICA experts.

##### 2) Cooperation with other institutions

Cooperation with various related organizations like the DA, IRRI, UPLB, etc. will be indispensable in developing crop irrigation technology. Close inter-relationships shall be formulated to exchange data and information on crop irrigation partly implemented already by these organizations.

(2) Establishment of the Market

Filipino farmers are not very willing to grow vegetables because their market distribution has not been well established, and the farmers cannot profit much from them. This results in little non-rice crop cultivation. Thus, the establishment of an efficient market distribution system is needed for the promotion and stabilization of secondary crop diversification throughout the Philippines for the satisfactory completion of the project.

(3) Studies on Suitable Crops

Studies on new types of crops are also indispensable for the success of the project to find the most appropriate type of crops for secondary cultivation. It is earnestly recommended that the government of the Philippines accelerate to study this subject.

(4) Realization of the Project

1) Prompt approval at each stage

As this project is a grant aid program of Japan, it needs to be carried out within the stated period. The signing of the E/N, consultant agreement, construction contract, and tax exemption permit for the supply of the services and equipment concerned in the project shall be carried out promptly.

2) Prompt completion of work by the government of the Philippines

It is expected that the NIA will complete the work they are responsible for without delay as they are well accustomed to the progress of grant aid projects. Necessary budgetary measures shall be secured well beforehand so that work such as demolishing of existing structures, grading, intake of water supply pipes, etc. is completed by the commencement of construction.

**ANNEX**



## ANNEX

### 1-1 MEMBER OF THE MISSION

#### (1) Member of the Basic Design Study Team

<u>Name</u>	<u>Specialty</u>	<u>Title</u>
Sosaku HAGIWARA	Leader	Director of Construction Dept. Tokai Regional Agriculture Office Ministry of Agriculture, Forestry and Fisheries
Tadanori SUZUKI	Project Coordinator	First Basic Design Div. Grant Aid Dept., JICA
Ryoichi KIBE	Architectural Planning	Yokogawa Architects & Engineers, Inc.
Shoichi TASHIRO	Architectural Design	Yokogawa Architects & Engineers, Inc.
Kiyotaka HAGIWARA	Mechanical Planning	Yokogawa Architects & Engineers, Inc.
Yasunori HASEGAWA	Research and Training Planning	Yokogawa Architects & Engineers, Inc.
Makoto ARIYOSHI	Equipment Planning	Yokogawa Architects & Engineers, Inc.

#### (2) Member of the Draft Mission Team

<u>Name</u>	<u>Specialty</u>	<u>Title</u>
Tomoyuki FUJII	Leader	Technical Cooperation Div. Agricultural Development Cooperation Dept., JICA
Ryoichi KIBE	Architectural Planning	Yokogawa Architects & Engineers, Inc.
Yasunori HASEGAWA	Research and Training Planning	Yokogawa Architects & Engineers, Inc.

1-2 SCHEDULE OF THE MISSION

(1) Schedule of the Basic Design Study Team

The basic design study was carried out for 18 days from January 21 to February 7, 1988.

<u>Date</u>	<u>Activities</u>
Jan. 21, Thu.	leave Narita for Manila (JAL-741) courtesy visit to the Japanese Embassy discussion with JICA
22, Fri.	courtesy visit to NIA general conference (explain the inception report) project site survey visit the DCIEP Office
23, Sat.	meeting with the Japanese experts
24, Sun.	data editing
25, Mon.	visit PETROLAB discussion with NIA about the questionnaire visit the San Rafael Experimental Farm and the NIA National Training Center
26, Tue.	individual discussions with NIA
27, Wed.	individual discussions with NIA field survey around the project site and the existing buildings visit NWSS -- survey the water intake system
28, Thu.	team meeting individual discussions with NIA prepare the draft of the minutes of discussions explain the draft of minutes
29, Fri.	sign the minutes of discussions report to the Japanese Embassy and JICA Office
30, Sat.	team meeting discussion with the local consultant co. field survey of local construction situation
31, Sun.	Govt. staff -- leave Manila for Narita (UA-090) Consul staff -- data editing / prepare the report



Feb. 1, Mon. individual discussions  
 visit MERALCO -- survey the electric power intake  
 visit PLDT -- survey the telephone piping intake  
 survey the prices of goods  
 research the support system from DA, BPI and other  
 governmental authorities

2, Tue. individual discussions  
 visit Manila Gas -- survey the LPG system  
 survey the main building of NIA  
 data editing  
 survey the prices of goods

3, Wed. general meeting with NIA  
 survey the similar projects -- PIPAC  
 NIA's reply as to the questionnaire and the survey  
 check list  
 survey team's presentation about the plans  
 investigate the drainage criteria at the National  
 Pollution Control Commission  
 survey the construction materials

4, Thu. survey the project site  
 collect technical data of architecture  
 individual discussions with NIA  
 visit IRRI and PCARRD

5, Fri. final meeting with NIA  
 final report to the JICA Office  
 survey prices of goods

6, Sat. survey prices of goods  
 survey the construction site of the Philippine Trade  
 Training Center Project  
 field survey of the construction situation  
 data editing

7, Sun. leave Manila for Narita (UA-090)

(2) Schedule of the Draft Mission

The draft mission was sent for 7 days from May 8 to 14, 1988.

<u>Date</u>	<u>Activities</u>
May 8, Sun.	leave Narita (10:00) for Manila (13:55) by PR-431 meeting with Mr. Niwa of the JICA Manila Office and the DCIEP experts at the Manila Peninsula as to the subjects for discussions
9, Mon.	courtesy visit and report to Mr. Hayashida, first secretary of the Japanese Embassy and Mr. Miyamoto, director of the JICA Manila Office courtesy visit to Mr. Alday, administrator of the NIA (submitting the draft final report) courtesy visit to the DCIEC project committee discussion with the DCIEP experts as to the draft report
10, Tue.	general meeting with the NIA
11, Wed.	separate meeting of architectural and equipment design general meeting with the NIA
12, Thu.	inauguration of San Rafael Experimental Farm general meeting with the NIA
13, Fri.	general meeting with the NIA with the presence of mr. Alday report to the Japanese Embassy and the JICA Manila Office
14, Sat.	leave Manila (8:55) for Narita (13:55) by UA-820

### 1-3 LIST OF PERSONNEL INTERVIEWED

#### NIA

Federico N. Alday	Administrator
Eduardo G. Fernandez	Asst. Administrator, PDI
Lino P. Aldovino	Manager, Design & Spec. Dept.
E. A. Macalalad	Manager, Training Division
Herminio C. Cruz	Manager, Arch. & Drafting Division
Antonio T. Aglugub	Div. Manager of Building & Facilities Maintenance Division
Ferdinando Guerzon	Building & Facilities Maintenance Div.
Abelardo Y. Armentia	Head, Feasibility & Environmental, PDD
Salvador Salandanan	Manager, Research & Development Div., SMD
Amosa C. Felizardo	Manager, Management Services Dept.
Serafin A. Palteng	Manager, DCIEP
Avelino S. Rivera	Manager, PDD
Herminio S. Sioson	Principal Architect, DSD

#### JICA Experts

##### - Independent

Yasuhiko Mishima	Irrigation & Drainage Planning
Osamu Umekawa	Water Management

##### - Diversified Crops Irrigation Engineering Project

Masao Morikawa	Team Leader
Koji Yamashita	Planning Criteria
Hideyuki Kanamori	Irrigation Engineering
Yutaka Tokunaga	Pedology
Yukiharu Koso	Planning Criteria
Takahiro Sasaki	Cordinator

#### Japanese Embassy

Yasuaki Nakajo	First Secretary
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#### JICA Office

Moriya Miyamoto	Resident Representative
Katsuhiko Oshima	Deputy Resident Representative
Noriaki Niwa	Officer-in-charge

Metropolitan Water Works and Sewage System (MWSS)

Ruben A. Hernandez Deputy Administrator  
Antonio E. Kaimo Deputy Manager  
Water Distribution & Maintenance

National Pollution Control Commission

Nudy Villanveva

Manila Electric Company (MERALCO)

Enrique S. Anastacio Head of Elect. & Communication Section

Philippine Long Distance Telephone (PLDT)

Noel C. Rempillo Operation Assistant

Manila Gas

Ethel R. Encarnacion LPG Sales Manager

Department of Agriculture (DA)

William D. Dar, Ph.D Director of Bureau of Agricultural  
Research

Bureau of Plant Industry (BPI)

Emiliano P. Gianzon Director

International Rice Research Institute (IRRI)

R. K. Pandey Breeder and Coordinator  
Rice Legume Improvement

Alfredo M. Mazaredo

Research Assistant  
Agricultural Engineering Dept.

1-4 MINUTES OF DISCUSSIONS

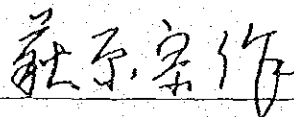
MINUTES OF DISCUSSIONS  
ON  
THE CONSTRUCTION PROJECT OF DIVERSIFIED CROPS  
IRRIGATION ENGINEERING CENTER  
IN THE REPUBLIC OF THE PHILIPPINES

In response to the request of the government of the Republic of the Philippines for the basic design study on the construction project of diversified crops irrigation engineering center (hereinafter referred to as "the Project"), the Government of Japan has dispatched, through the Japan International Cooperation Agency, a study team headed by MR. SOSAKU HAGIWARA, Director, TOKAI Regional Agricultural Office, Ministry of Agriculture, Forestry and Fisheries, to carry out the basic design study from January 21 to 31, 1988.

The team has conducted field survey and held a series of discussions and exchanged views with the concerned officials headed by Atty. Federico N. Alday, Jr, Administrator, National Irrigation Administration, on the Project.

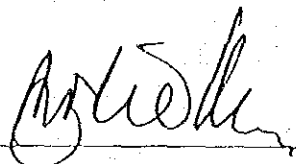
As a result of the survey and discussions, both parties agreed to recommend to their respective governments to examine the major points of understanding reached between them, attached herewith towards the realization of the Project.

January 29, 1988



SOSAKU HAGIWARA

Leader of the Japanese  
Basic Design Study Team



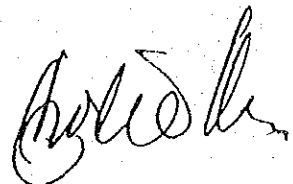
FEDERICO N. ALDAY, JR.

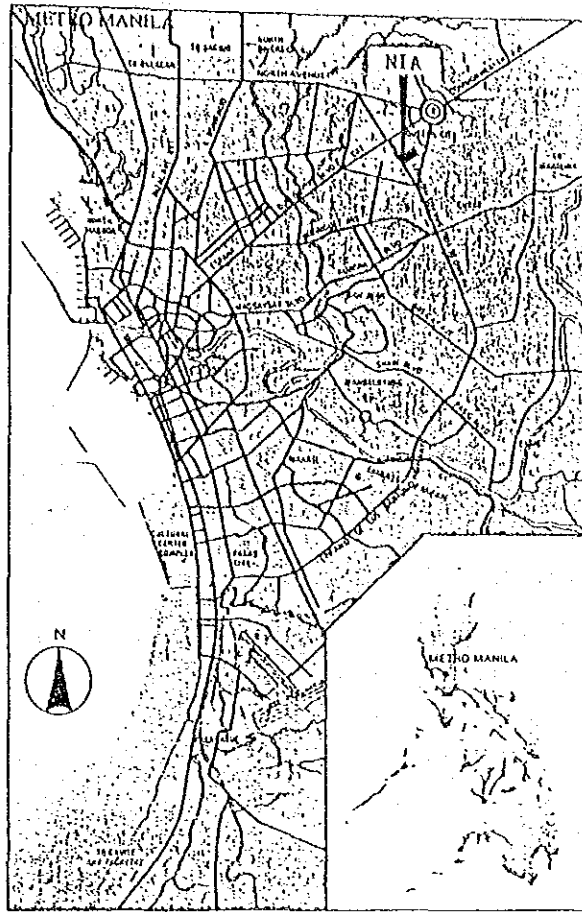
Administrator  
National Irrigation Administration

ATTACHMENT

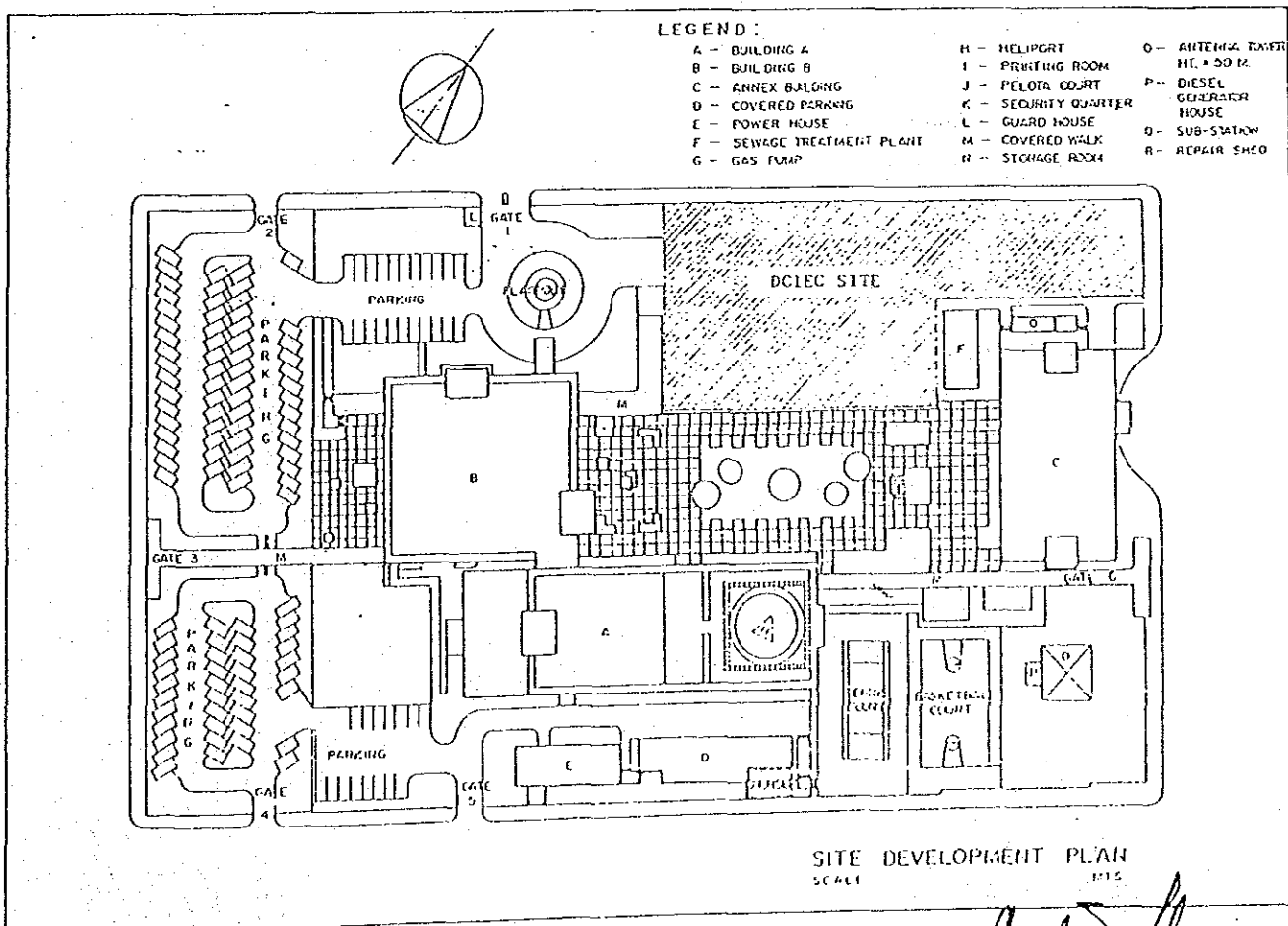
1. The National Irrigation Administration (hereinafter referred to as "NIA") has already acquired the land as the proposed site for the Diversified Crops Irrigation Engineering Center (hereinafter referred to as "DCIEC") of NIA. It is located in the compound of NIA Main Office in Diliman, Quezon City, Metro Manila, as per attached in Annex I.
2. The objectives of the Project are to construct new buildings and to install facilities as well as equipment for DCIEC in order to enhance the capabilities of NIA in serving the Philippine agriculture in investigating the most appropriate methods of irrigating diversified crops and establishing standards for planning and designing facilities for crops other than rice, and thus assume a center in this field in the Philippines.
3. NIA is the overall executing and implementing agency for the Project and assumes responsibility for the management, administration and operation of DCIEC.
4. Japanese Study Team will convey the request of NIA to the Government of Japan that the Government of Japan will take necessary measures to cooperate in implementing the Project and provide the Government of the Philippines with buildings, facilities and equipment as listed in Annex II within the scope of Japan's Grant-Aid Program.
5. The Philippine side has understood the Japan's Grant-Aid Program including the principle of engaging a Japanese consulting firm and Japanese firms for the implementation of the Project.
6. The Philippine side has confirmed to take the necessary measures as listed in Annex III on the condition that the Grant-Aid for the execution of the Project is extended by the Government of Japan.
7. The Basic Design Study Report will be submitted to the Philippine Government by the end of June, 1988.

S.H.





Location Map



SIA.

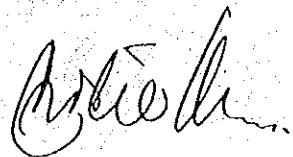
The facilities for DCIEC are as follows:

1. Main Center Building
  - a. Parking
  - b. Laboratory
  - c. Analysis room
  - d. Preparation room
  - e. Canteen/kitchen
  - f. Administration office
  - g. Conference room
  - h. Exhibition room
  - i. Library
  - j. Class room
  - k. Seminar room
  - l. Printing room
  - m. Others
2. Dormitory Building
  - a. Dormitory
  - b. Guest room
  - c. Pantry
  - d. Others

The equipment for the DCIEC are as follows:

1. Equipment for Research
  - 1.1. Equipment for water analysis
  - 1.2. Equipment for soil chemical analysis
  - 1.3. Equipment for soil engineering test
  - 1.4. Computer
2. Equipment for Training
  - 2.1. Audio-visual equipment
  - 2.2. Printing equipment

S.A.

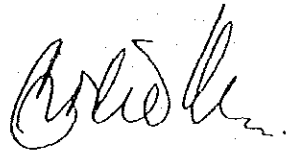




LIST OF MEASURES TO BE UNDERTAKEN BY NIA

The following are the necessary measures to be undertaken by NIA in connection with the successful execution and operation of the Project:

1. To secure the lot necessary for the Project and the construction of the Center.
2. To clear, level, and fill as needed, the site of the Center before the mobilization of the construction of the Project.
3. To provide the following facilities/utilities and appurtenant works in connection with the construction of the Center:
  - 3.1. Power distribution to the site
  - 3.2. Water supply to the site
  - 3.3. Main drainage to the site
  - 3.4. Telephone trunkline to the main distribution frame/panel (MDF) of the buildings
  - 3.5. To furnish additional furnitures except those which are provided under the Grant-Aid
  - 3.6. Other incidental utilities, facilities, and services in connection with the above and the overall management and supervision activities in the construction and operation of the Center.
4. To assume commissions to the Japanese foreign exchange bank for banking services based on the banking arrangement as follows:
  - 4.1. Advising Commission of Authorization to Pay
  - 4.2. Payment Commission
5. To ensure prompt unloading, tax exemptions, customs clearances at ports of disembarkation in the Philippines and prompt internal transportation therein of the products and commodities purchased under the grant-aid.



6. To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contracts, such facilities as may be necessary for their entry into and stay in the Philippines for the performance of their work.
7. To exempt Japanese nationals from customs duties, internal taxes, and other fiscal levies which may be imposed in the recipient country with respect to the supply of products and services under the verified contracts.
8. To maintain and use properly and effectively the facilities to be constructed and the equipment to be provided under the verified contracts and purchased under the grant-aid.
9. To bear all the expenses, other than those to be borne by the grant-aid, necessary for the construction of the facilities as well as for the transportation and installation of equipment.
10. To assign all the necessary staff for the proposed activities of the Center upon the execution and completion of the Project.

*S.D.*

*Wick*

MINUTES OF DISCUSSIONS  
ON  
THE DRAFT FINAL REPORT OF  
THE BASIC DESIGN STUDY ON  
THE CONSTRUCTION PROJECT OF DIVERSIFIED CROPS  
IRRIGATION ENGINEERING CENTER  
IN THE REPUBLIC OF THE PHILIPPINES

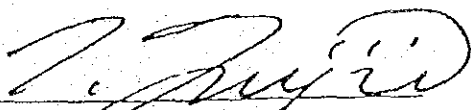
The Government of Japan sent the Mission to carry out the Basic Design Study on the construction project of Diversified Crops Irrigation Engineering Center (DCIEC) through the Japan International Cooperation Agency (JICA) from January 21 to February 7, 1988.

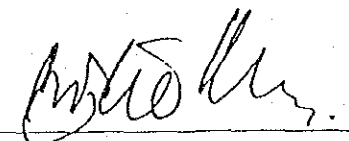
The Mission carried out field surveys, held series of discussions and exchanged views with the National Irrigation Administration (NIA) headed by Atty. Federico N. Alday, Jr., Administrator.

Based on the surveys in the Philippines and further examinations in Japan, JICA prepared a Draft Final Report on the Study and dispatched a Draft Final Mission headed by Mr. Tomoyuki Fujii of the Technical Cooperation Division, Agricultural Development Cooperation Department, JICA, to discuss and finalize it with NIA on May 8 to 14, 1988.

Both parties confirm the result of the discussions contained in the attached document.

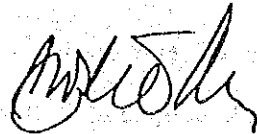
Quezon City, Philippines, May 13, 1988

  
MR. TOMOYUKI FUJII  
Team Leader  
JICA Draft Final Mission

  
ATTY. FEDERICO N. ALDAY, JR.  
Administrator  
National Irrigation Administration

MAJOR POINTS OF UNDERSTANDING

1. The Philippine side (NIA) has agreed to the basic design proposed in the Draft Final Report. Appropriate changes agreed on during the discussions shall be incorporated in the Final Report.
2. The Final Report (10 copies in English) on the basic design study shall be submitted by JICA to NIA by July 1988.
3. NIA shall cause the installation of a new water supply pipe from East Avenue to the DCIEC before the start of construction.
4. In case the Value Added Tax (VAT) law under Executive Order No. 273 is applicable to any part of the project, NIA shall pay the VAT.

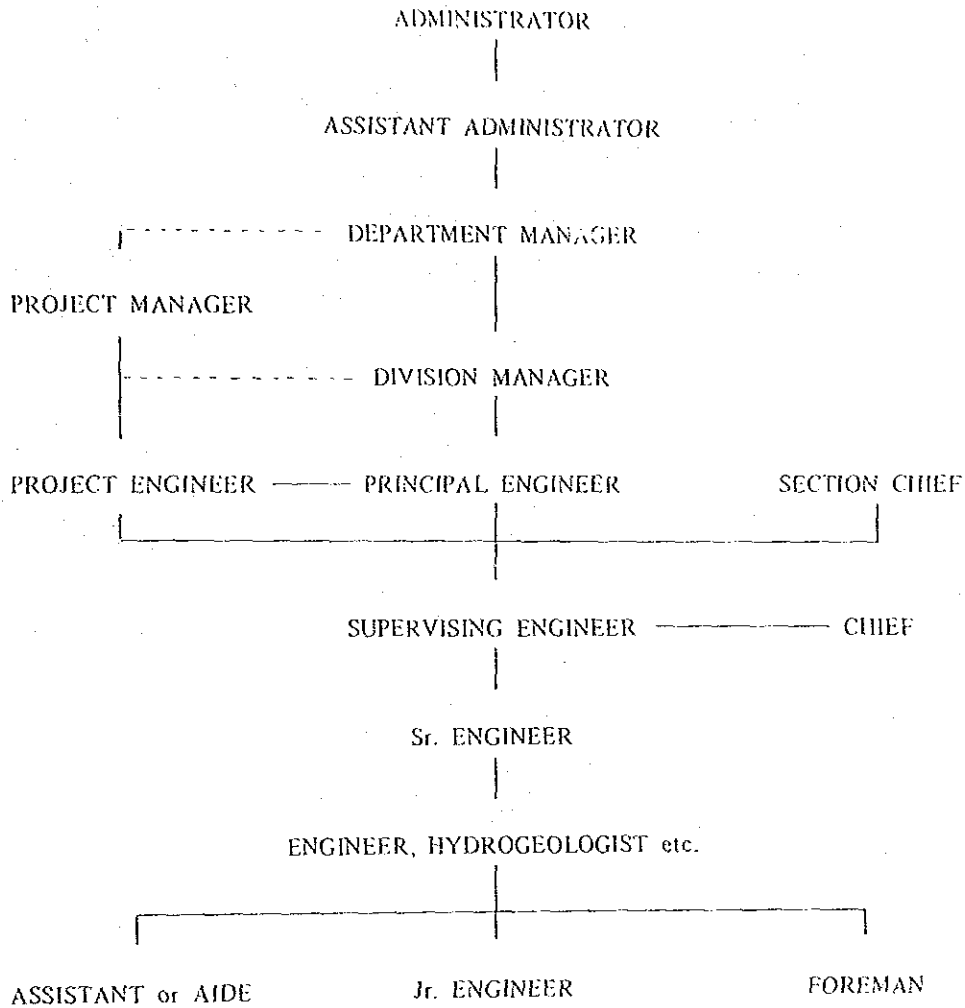


1-5 LIST OF COLLECTED DATA AND INFORMATION

- |   |                     |
|---|---------------------|
| (1) NIA MEDIUM-TERM IRRIGATION DEVELOPMENT PLAN<br>1987 - 1992  | NIA                 |
| (2) STUDY OF FOOD DEMAND AND SUPPLY AND RELATED<br>STRATEGIES FOR DEVELOPING MEMBER COUNTRIES<br>- A JOINT IFPRI/IRRI | NIA                 |
| (3) DIAGRAM OF THE NATIONAL IRRIGATION SYSTEMS  | NIA                 |
| (4) LOCATION MAP OF THE NATIONAL IRRIGATION SYSTEMS   | NIA                 |
| (5) DRAWING OF THE NATIONAL IRRIGATION<br>ADMINISTRATION BUILDING COMPLEX   | NIA                 |
| (6) REPORT ON THE SOIL SURVEY   | NIA                 |
| (7) THE NATIONAL BUILDING CODE OF THE PHILIPPINES   | National Book Store |
| (8) PHILIPPINE STATISTICAL YEARBOOK 1987  | National Book Store |
| (9) THE LABOR CODE  | National Book Store |



# HIERARCHY OF THE NIA



Note: Relation of the hierarchy and work experience in the NIA

- (1) Sr. engineers have 5 or more year experience after graduating from the universities.
- (2) Supervising engineers and principal engineers have 7 or more year experience after graduating from the universities.

TOTAL NUMBER OF TECHNICAL PERSONNEL IN  
C. O. & REGIONAL OFFICES AS OF AUG. 1986

Dept. Mgr.	A	—	1	Geodetic Eng'g. Asst.	B	—	56
	B	—	40	Eng'g. Aide.	C	—	42
	C	—	2	Eng'g. Aide.	B	—	3
	D	—	2	Chief Geologist		—	1
Div. Mgr.	A	—	2	Supvg. Geologist		—	1
	B	—	5	Sr. Geologist		—	2
	C	—	4	Geologist		—	3
	D	—	6	Supvg. Soil Tech.		—	2
Prin. Engr.	A	—	32	Sr. Soil Tech.		—	4
	B	—	54	Soil Tech.	B	—	5
	C	—	6	Soil Tech.	A	—	9
	D	—	7	Asst. Soil Tech.		—	2
Proj. Mgr.	D	—	3	Sr. Agronomist	A	—	2
Proj. Engr.	B	—	1	Agronomist	A	—	8
Supvg. Engr.	A	—	26	Agricultural Specialist		—	1
	B	—	108	Sr. Agriculturist		—	1
Sr. Engr.	B	—	140	Agriculturist		—	17
Sr. Geod. Engr.	B	—	8	Prin. Architect		—	1
Engineer	A	—	115	Sr. Architect		—	2
	B	—	189	Architect	B	—	2
Sr. Hydrogeologist		—	1	SIAO		—	13
Hydrogeologist	B	—	2	FOS		—	18
	A	—	6	FTO		—	9
Sr. Hydrologist	B	—	1	I. O. W.		—	16
Hydrologist		—	21	Famers Asst. Specialist		—	2
Geodetic Engr.	B	—	1	Famers Asst. Supvr.		—	4
Sr. Cartographer		—	1	Farm Mgt. Specialist		—	3
Photogrammetrist		—	1	Aut. Repair Gen. Foreman		—	16
Geodetic Eng'g. Asst.	A	—	56		TOTAL	—	1,092

SIAO — Supervising Irrigation Association Organizer.

FOS — Farmers Organization Specialist.

FTO — Farm Training Officer.

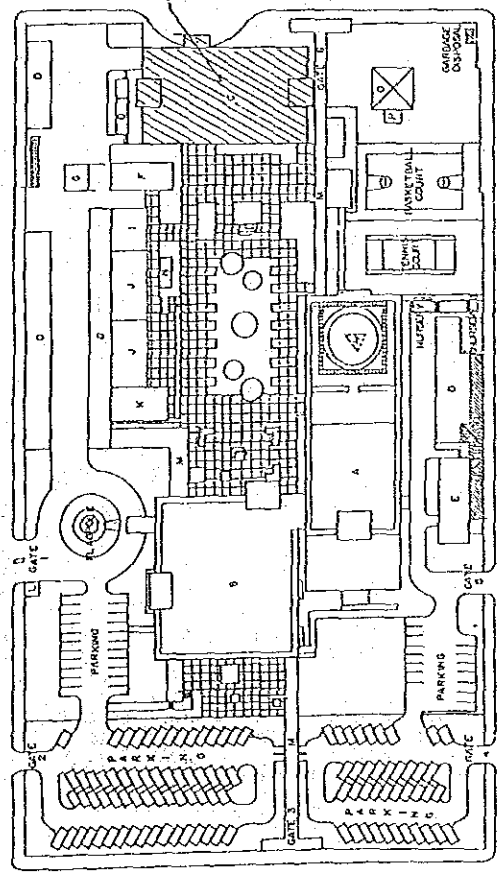
I. O. W. — Irrigation Organization Worker.

(by the NIA)



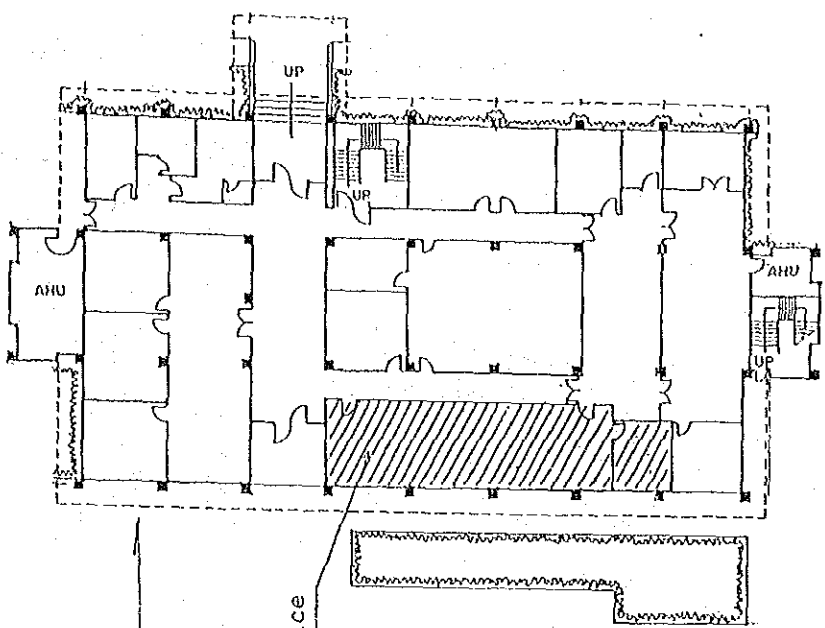
LOCATION OF THE PROJECT OFFICE

- LEGEND:
- A - BUILDING A
  - B - BUILDING B
  - C - ANNEX BUILDING
  - D - COVERED PARKING
  - E - POWER HOUSE
  - F - SEWAGE TREATMENT PLANT
  - G - GAS TANK
  - H - HELIUM
  - I - PRINTING ROOM
  - J - PELOTA COURT
  - K - SECURITY QUARTER
  - L - GUARD HOUSE
  - M - COVERED WALK
  - N - STORAGE ROOM
  - O - ANTENNA TOWER  
HT. 50 M.
  - P - DIESEL GENERATOR
  - Q - HOUSE
  - R - SUB-STATION



SITE DEVELOPMENT PLAN  
SCALE: 1:1000  
M.T.S.

NATIONAL IRRIGATION ADMINISTRATION



GROUND FLOOR PLAN BLDG. ANNEX  
SCALE 1:300 M.T.S.

### 3-1 COUNTRY DATA

Table 2.3 - TOTAL NUMBER OF FAMILIES, TOTAL AND AVERAGE FAMILY INCOME AND EXPENDITURES BY INCOME CLASS, URBAN AND RURAL: 1985

Income class	Total number of families (thousands)	Income		Expenditures	
		Total (thousand pesos)	Average (pesos)	Total (thousand pesos)	Average (pesos)
<b>Urban</b>					
Total	3,726	171,869,677	46,127	145,815,208	39,134
Under ₱ 6,000	45	195,664	4,349	288,623	6,415
6,000 - 9,999	168	1,380,440	8,239	1,557,600	9,296
10,000 - 14,999	369	4,678,960	12,681	4,921,564	13,338
15,000 - 19,999	444	7,786,993	17,553	7,907,224	17,824
20,000 - 29,999	757	18,737,649	24,742	18,359,192	24,243
30,000 - 39,999	553	19,202,853	34,703	17,572,202	31,756
40,000 - 59,000	647	31,447,237	48,637	27,996,901	43,301
60,000 - 99,999	457	34,814,518	73,126	29,599,596	64,723
100,000 and over	286	53,625,363	187,278	37,612,306	131,355
<b>Rural</b>					
Total	6,121	133,905,597	21,875	118,736,647	19,397
Under ₱ 6,000	331	1,504,186	4,546	1,790,605	5,412
6,000 - 9,999	949	7,821,735	8,240	8,382,894	8,831
10,000 - 14,999	1,409	17,528,298	12,440	17,319,285	12,291
15,000 - 19,999	1,096	18,982,821	17,317	17,934,513	16,360
20,000 - 29,999	1,179	28,635,792	24,288	26,184,948	22,209
30,000 - 39,999	532	18,199,536	34,191	16,012,214	30,082
40,000 - 59,000	397	19,051,728	47,995	15,787,583	39,772
60,000 - 99,999	168	12,410,754	73,692	9,467,480	56,216
100,000 and over	59	9,770,747	164,889	5,857,174	98,845

Source: National Census and Statistics Office.

Table 2.29 - PRODUCER PRICE INDEX FOR AGRICULTURAL PRODUCTS, PHILIPPINES: 1972 TO 1986 (1978=100)

Year	All items	Cereals	Vegetables	Root-crops	Fruits	Commercial crops	Poultry	Livestock
1972	50.3	59.4	50.9	53.7	57.5	43.1	43.8	47.8
1973	54.6	63.6	52.8	59.1	57.7	53.3	46.5	45.6
1974	88.4	91.4	95.8	87.5	88.6	103.9	73.2	72.2
1975	88.6	95.6	104.7	89.3	101.2	83.2	81.1	81.4
1976	86.0	99.0	83.2	86.8	86.7	89.9	88.0	78.2
1977	95.6	102.8	75.1	94.8	95.3	95.4	95.8	90.0
1978	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1979	111.8	103.7	132.1	122.9	128.4	114.6	113.0	114.1
1980	118.0	112.9	131.4	150.6	140.3	114.5	129.9	115.9
1981	126.3	128.9	133.0	165.6	166.0	102.6	142.7	124.1
1982	131.3	135.3	88.3	165.7	215.0	117.7	153.3	130.0
1983	155.3	148.0	152.5	195.0	228.6	155.0	166.7	139.0
1984	265.0	242.3	221.2	318.0	367.0	286.6	260.4	244.7
1985	285.6	316.2	244.4	337.9	335.0	249.3	315.2	245.5
1986	276.5	274.0	265.3	346.7	350.0	236.4	330.4	256.9
January	282.4	289.4	325.3	351.7	320.9	242.2	331.1	263.3
February	287.4	302.5	276.2	362.7	378.1	230.1	333.0	269.1
March	282.9	288.8	255.3	345.2	385.3	229.2	330.7	272.7
April	280.6	282.1	232.1	336.8	355.0	235.1	333.0	278.9
May	277.6	282.6	171.6	363.1	358.6	231.7	323.5	280.0
June	271.4	271.6	193.6	346.3	333.5	229.7	325.3	275.5
July	264.7	270.3	261.9	351.1	324.3	220.7	325.1	240.3
August	266.1	261.6	255.2	330.2	347.7	226.4	322.8	244.4
September	271.0	266.6	279.8	358.9	342.6	225.1	325.3	241.4
October	271.6	256.3	309.6	339.0	345.8	245.4	336.0	234.2
November	279.8	257.1	305.4	322.6	352.7	254.5	333.1	241.6
December	282.4	258.9	317.3	353.1	355.2	266.3	345.4	242.0

Source: Bureau of Agricultural Economics.

Table 3.1 - GROSS NATIONAL PRODUCT AND EXPENDITURE ACCOUNT: 1960 to 1986  
(In million pesos at current prices)

Item	1960	1965	1970	1972	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1. Compensation of employees and entrepreneurial and property income of persons	11,616	19,387	32,876	43,885	85,236	100,586	117,550	129,834	160,758	194,238	223,297	248,557	278,067	416,147	463,849	470,866
2. General government income from property and entrepreneurship	23	31	65	198	493	626	1,379	1,385	1,528	2,525	3,184	4,138	5,801	7,033	9,317	12,820
3. Corporate income	447	734	1,907	1,708	5,243	6,374	5,706	12,427	14,832	17,925	19,873	19,399	21,003	6,506	5,181	6,594
a. Corporate tax	273	359	765	865	2,003	2,223	1,961	2,642	2,873	3,402	3,870	4,503	4,799	8,181	8,350	8,675
b. Corporate savings	174	375	1,142	843	3,240	4,151	3,745	9,785	12,059	14,524	16,003	14,896	16,209	(1,675)	(3,169)	(2,081)
NATIONAL INCOME OR NET NATIONAL PRODUCT at factor cost	12,086	20,152	34,848	45,791	90,972	107,586	124,535	143,646	177,218	214,689	246,354	272,094	304,876	429,686	478,347	490,280
4. Indirect taxes	1,008	1,583	3,355	4,530	12,850	12,821	14,400	18,235	23,789	26,606	27,408	29,512	35,608	44,697	50,216	53,955
5. Less subsidies	27	88	166	148	861	568	392	573	588	760	776	847	919	777	1,287	1,626
6. Capital consumption allowance	756	1,735	3,714	5,353	11,304	12,873	15,637	16,759	20,538	24,543	30,658	34,664	39,180	53,749	67,222	71,682
GROSS NATIONAL PRODUCT in purchaser's value	13,833	23,382	41,751	55,526	114,265	132,712	154,280	178,067	220,957	265,078	303,644	335,423	378,745	527,355	594,516	614,291
7. Personal consumption expenditure	10,702	17,949	29,552	39,922	76,185	87,120	102,626	118,846	146,577	178,119	206,942	234,486	268,188	403,431	469,133	474,991
8. General government consumption expenditures	1,094	2,120	3,514	5,260	10,945	14,050	14,489	16,564	18,259	21,191	24,792	29,215	29,481	35,567	42,469	48,553
9. Gross domestic capital formation	2,247	4,883	8,992	11,573	35,705	41,053	44,251	51,706	68,840	81,148	93,261	96,521	102,526	91,951	85,402	82,199
a. Fixed capital formation	1,892	4,134	6,701	8,831	27,800	32,753	36,322	42,528	57,459	67,993	79,285	86,026	95,254	100,095	89,974	80,974
b. Increases in stocks	355	749	2,291	2,742	7,905	8,300	7,929	9,178	11,381	13,155	13,976	10,495	7,272	(8,144)	(4,572)	1,225
10. Exports of goods and non-factor services	1,489	4,046	8,095	9,877	21,272	23,248	29,306	31,557	41,461	54,181	57,806	56,150	75,267	117,701	126,571	155,104
11. Less: Imports of goods and non-factor services	1,480	4,040	8,236	10,334	29,057	31,841	34,875	41,321	53,951	68,924	74,359	79,321	101,138	118,382	108,506	116,188
12. Statistical discrepancy	(43)	(1,462)	531	(223)	(427)	298	(366)	1,251	(1,109)	293	(3,168)	3,534	9,771	10,198	(5,610)	(17,942)
EXPENDITURES ON GROSS DOMESTIC PRODUCT	14,029	23,496	42,448	56,075	114,603	133,928	155,631	178,603	220,477	266,008	305,274	340,585	384,095	540,466	609,459	626,717
13. Net factor income from the rest of the world	(196)	(114)	(697)	(549)	(338)	(1,216)	(1,351)	(536)	480	(930)	(1,630)	(5,162)	(5,350)	(13,111)	(14,941)	(12,426)
EXPENDITURES ON GROSS NATIONAL PRODUCT	13,833	22,382	41,751	55,526	114,265	132,712	154,280	178,067	220,957	265,078	303,644	335,423	378,745	527,355	594,516	614,291

Preliminary estimates as of May 1987  
Source: National Accounts Staff, Statistical Coordination Office,  
National Economic and Development Authority.

Figure 5.1  
 QUANTITY AND VALUE OF CROP PRODUCTION, PHILIPPINES:  
 CROP YEARS 1981 to 1986

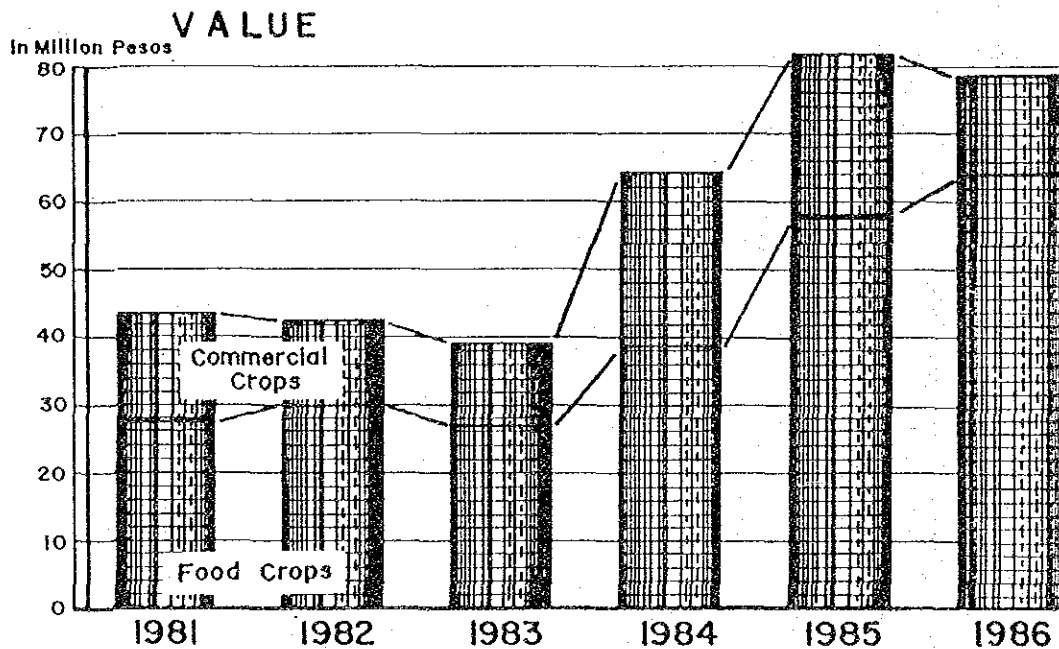
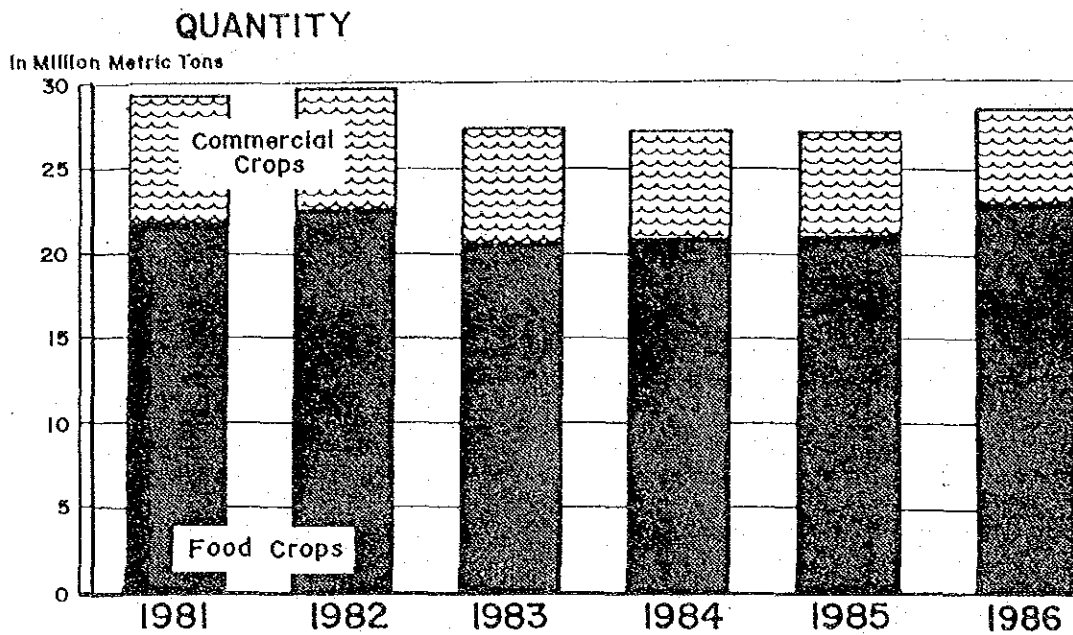


Table 5.1 - QUANTITY AND VALUE OF AGRICULTURAL PRODUCTION BY KIND OF CROP, PHILIPPINES: 1950 TO 1986  
(Quantity in thousand metric tons; Value in million pesos)

Crop Year	Food												Other fruits and nuts					
	All Crops			Commercial			Palay (rough rice)			Crops			Banana	Mango	Pineapple	Other fruits and nuts		
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value					Quantity	Value
1950	6,011.0	1,497.9	4,275.8	1,014.9	1,735.2	483.0	2,606.1	768.6	573.7	89.4	161.4	37.8	27.4	11.7	56.5	8.5	80.6	17.2
1955	8,885.1	1,563.2	6,054.1	935.7	2,831.0	627.5	3,202.9	612.1	770.1	106.0	294.8	21.3	50.4	17.7	103.2	14.6	147.0	25.1
1960	10,411.4	2,046.1	7,315.1	1,167.9	3,096.3	878.2	3,739.5	711.9	1,165.3	149.7	307.3	24.1	57.6	13.9	133.9	19.5	176.6	31.4
1965	12,247.0	3,278.5	8,478.9	1,965.2	3,764.1	1,313.3	3,992.5	1,227.7	1,312.7	272.8	684.8	44.1	129.4	27.6	176.1	25.3	223.2	41.3
1970	15,486.8	8,154.0	10,670.0	4,750.3	4,816.8	3,403.7	5,233.4	2,073.7	2,008.2	525.9	896.0	656.9	151.7	142.9	233.4	109.5	288.4	212.5
1971	15,862.8	9,289.8	11,016.1	5,685.1	4,847.7	3,584.7	5,578.4	2,613.6	2,011.8	723.4	1,034.8	811.8	137.5	127.0	234.3	121.4	256.6	198.5
1972	15,657.5	10,525.7	10,865.7	6,933.1	4,791.8	3,592.6	5,324.9	3,369.3	2,024.2	1,048.1	980.1	781.2	143.4	132.3	282.1	146.6	337.2	287.5
1973	15,515.4	10,930.7	10,096.5	6,392.4	5,418.9	4,538.3	4,609.2	2,771.2	1,842.8	831.4	1,012.6	814.7	187.6	180.0	293.4	166.4	309.8	284.6
1974	17,926.7	18,031.2	12,288.0	10,557.0	5,638.7	7,474.2	5,840.7	5,180.1	2,257.5	1,504.6	1,235.5	1,038.1	191.5	297.8	338.3	285.7	326.8	427.0
1975	20,002.4	20,329.4	13,743.9	13,603.1	6,258.5	6,726.3	5,909.5	5,579.5	2,513.9	2,100.9	1,686.0	1,542.6	239.3	254.9	424.4	504.1	337.4	569.2
1976	23,551.5	20,433.8	15,561.9	14,504.7	7,889.6	5,929.1	6,431.0	6,200.0	2,717.3	2,394.6	2,270.6	817.0	293.1	592.0	419.9	521.5	347.1	553.4
1977	24,722.5	28,092.2	17,072.9	17,217.9	7,649.6	10,874.3	6,740.6	6,890.1	2,774.8	2,605.3	2,447.4	1,043.9	307.6	684.7	421.8	558.1	470.9	749.5
1978	26,340.4	27,065.2	18,615.5	18,373.1	7,724.9	8,692.1	7,196.8	7,093.5	2,796.1	2,671.4	3,195.0	1,510.4	335.2	678.5	464.6	707.0	506.4	825.5
1979	28,240.5	34,032.2	20,478.7	20,900.8	7,761.8	13,131.4	7,514.8	7,573.9	3,090.3	2,851.1	3,581.8	1,749.0	363.3	1,056.5	604.6	736.1	607.7	1,055.5
1980	29,809.1	37,992.1	21,837.1	23,568.4	7,972.0	14,423.7	7,835.8	8,376.6	3,122.8	3,024.1	3,977.1	2,154.9	377.2	1,208.5	1,280.7	721.8	524.4	701.4
1981	29,507.8	42,368.1	21,748.6	26,539.8	7,759.2	15,828.3	7,722.8	9,304.5	3,109.7	3,501.7	4,072.9	2,160.8	366.6	1,577.9	1,292.7	1,032.8	518.3	818.8
1982	29,709.3	41,355.2	22,258.7	28,254.3	7,450.6	13,100.9	8,121.7	10,924.1	3,290.2	3,985.7	4,077.5	2,376.9	426.3	1,786.4	1,242.1	1,114.7	578.1	913.7
1983	27,459.9	38,217.3	20,372.8	26,202.3	7,087.1	12,015.0	7,305.5	10,721.9	3,125.9	3,949.3	3,885.8	2,197.4	372.6	1,494.4	1,682.9	1,456.5	333.7	581.1
1984	27,332.9	63,698.2	20,858.6	38,278.6	6,474.2	25,419.7	7,840.9	15,311.8	3,346.2	5,166.8	3,828.9	3,421.4	378.0	2,633.3	1,718.9	1,781.8	316.4	669.9
1985	27,093.2	81,545.6	21,092.0	57,395.0	6,001.0	24,150.6	7,400.1	24,969.9	3,438.8	5,942.6	3,697.8	4,255.0	384.3	3,109.4	1,448.6	2,182.1	300.2	902.9
1986	28,529.8	77,862.3	22,921.4	63,710.4	5,608.4	14,151.8	9,097.1	27,983.1	3,322.0	9,842.1	3,830.2	4,855.3	296.3	2,994.8	1,601.9	3,423.9	311.9	1,000.9

<sup>1</sup>Includes atis, avocado, calamito, cashew, chico, guayabano, jackfruit, lanzones, papaya, pili and watermelon from 1950 to the present. Grapes were included starting 1975.

<sup>2</sup>Includes calamansi, mandarin, orange and pomelo.

<sup>3</sup>Includes camote, cassava, gabi pao (galing), toqui and ubi.

<sup>4</sup>Vegetables include cabbage, eggplant, garlic, pechay, radish and tomatoes from 1950 to the present. Ginger was included starting 1970.

<sup>5</sup>Includes drybeans and mungo from 1950 to the present. Soybeans were included starting 1970.

<sup>6</sup>Includes other fruits and vegetables.

<sup>7</sup>Includes nuts used for making copra, desiccated coconut, home-made oil and as food nuts from 1950 to the present. Nuts used for commercial manufacturing were included starting 1970.

<sup>8</sup>Includes sugarcane used for centrifugal sugar, muscovado, pinocha and molasses.

<sup>9</sup>Includes kapok from 1950 to the present. Starting 1975, castor beans and cotton (seeded) were added to this category.

Sources: National Economic and Development Authority (formerly NEC), The Raw Materials Resources Survey Bulletin, Series No. 1, June 1959; Agricultural Economics Division, DANR, Crop, Livestock and Natural Resources Statistics, Bureau of Agricultural Economics.

Table 5.1 - QUANTITY AND VALUE OF AGRICULTURAL PRODUCTION BY KIND OF CROP, PHILIPPINES: 1950 TO 1986 (continued)  
(Quantity in thousand metric tons; Value in million pesos)

Crop Year	Food Crops										Commercial crops											
	Citrus?		Rootcrops?		Vegetables including onions & potatoes		Beans & peas?		Coffee		Cacao		Peanut (unshelled)		Other food crops?		Rubber		Mesqu		Other commercial crops?	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1950	19.8	5.2	664.3	47.0	52.5	11.7	15.4	7.4	4.0	6.8	0.7	1.5	12.3	4.1	1.1	n.a.	1.3	1.1	1.8	0.6	3.4	0.4
1955	31.5	9.7	1,200.0	50.7	183.1	38.2	40.0	19.4	7.9	18.9	1.1	9.5	17.9	5.3	6.2	0.4	2.0	2.4	0.2	0.1	3.0	0.9
1960	43.3	10.5	1,411.6	84.3	263.2	45.9	42.3	23.3	10.9	28.1	2.1	11.3	23.3	7.2	8.2	1.4	3.1	3.5	2.1	0.5	4.4	1.4
1965	70.9	21.5	1,538.7	149.3	318.0	60.3	25.7	14.0	49.0	58.1	4.3	20.5	13.2	5.0	48.5	2.0	5.9	6.7	2.5	0.5	2.0	0.7
1970	70.7	41.0	1,318.3	404.3	310.2	245.8	37.8	37.8	49.0	222.8	4.3	20.5	17.4	16.0	68.0	40.5	19.0	27.9	2.4	3.2	1.7	2.1
1971	62.7	37.0	1,220.8	426.6	304.4	275.1	23.6	39.5	49.5	219.6	3.6	18.9	18.9	19.1	79.2	52.7	18.9	29.2	2.4	3.2	1.6	2.3
1972	65.5	41.0	1,217.7	446.7	305.6	302.7	23.6	41.6	51.6	236.8	3.5	19.8	18.9	19.8	87.4	60.5	18.9	29.2	2.4	3.2	1.6	2.3
1973	63.8	50.9	1,220.5	490.5	345.1	383.1	23.9	41.6	50.9	233.8	3.6	19.6	18.2	24.3	113.1	91.5	18.2	29.2	2.4	3.2	1.6	2.3
1974	61.8	87.6	1,410.8	560.9	400.0	588.7	23.2	67.0	53.0	291.3	4.1	34.9	21.5	41.3	123.4	152.0	21.5	29.2	2.4	3.2	1.6	2.3
1975	77.9	102.5	1,807.1	811.9	444.6	1,000.9	34.9	129.6	91.4	647.1	3.3	35.3	36.2	98.5	138.0	226.1	35.3	29.2	2.4	3.2	1.6	2.3
1976	120.2	242.8	2,143.5	892.4	463.6	873.1	41.1	152.7	80.8	640.5	3.2	45.0	40.8	128.5	269.7	450.3	45.0	29.2	2.4	3.2	1.6	2.3
1977	135.0	266.6	2,773.6	1,275.6	497.0	743.5	41.7	174.2	105.1	1,562.4	2.9	62.2	46.2	148.6	453.2	658.7	62.2	29.2	2.4	3.2	1.6	2.3
1978	127.7	263.8	3,004.4	1,060.2	524.3	853.9	41.1	163.7	118.8	1,871.8	3.1	78.8	37.8	116.1	306.4	479.5	78.8	29.2	2.4	3.2	1.6	2.3
1979	122.1	311.2	3,568.8	1,582.9	467.2	992.3	42.0	195.5	115.5	1,755.0	3.8	132.8	49.2	181.4	347.6	747.6	132.8	29.2	2.4	3.2	1.6	2.3
1980	130.5	408.7	3,469.7	1,896.5	505.3	1,247.4	47.3	226.2	125.3	2,635.7	4.1	133.2	49.9	188.3	387.0	645.1	133.2	29.2	2.4	3.2	1.6	2.3
1981	129.9	393.1	3,406.6	2,191.9	502.3	1,411.9	48.5	293.3	146.7	3,042.7	4.2	102.7	29.6	129.1	397.8	578.6	102.7	29.2	2.4	3.2	1.6	2.3
1982	132.6	459.7	3,173.5	1,532.7	515.2	1,506.3	50.3	253.9	171.4	1,784.4	5.3	103.6	48.6	233.5	424.9	658.7	103.6	29.2	2.4	3.2	1.6	2.3
1983	130.1	313.5	2,102.3	1,532.7	448.8	1,258.0	36.9	180.3	146.9	1,705.6	5.5	81.0	35.8	170.2	335.1	539.2	81.0	29.2	2.4	3.2	1.6	2.3
1984	124.2	450.2	2,286.5	2,433.9	476.8	2,095.1	38.0	322.0	116.8	1,819.3	4.8	106.3	42.2	281.5	350.0	785.2	106.3	29.2	2.4	3.2	1.6	2.3
1985	123.4	548.5	2,453.2	3,430.0	467.2	2,681.9	41.2	421.0	131.4	3,159.1	5.1	161.8	45.2	383.7	353.2	1,212.3	161.8	29.2	2.4	3.2	1.6	2.3
1986	132.2	619.4	2,668.5	3,915.9	487.3	2,888.5	37.7	406.8	136.5	3,882.4	6.2	189.4	43.9	430.9	359.7	1,277.2	189.4	29.2	2.4	3.2	1.6	2.3
1990	846.1	260.8	654.0	146.8	82.2	52.6	26.4	20.7	10.1	17.5	1.7	1.1	1.3	1.1	1.8	0.6	1.3	1.1	1.8	0.6	3.4	0.4
1995	1,142.9	241.4	1,546.6	321.4	104.5	35.2	20.0	7.5	34.2	60.3	2.2	1.1	2.0	2.4	0.2	0.1	2.0	2.4	0.2	0.1	3.0	0.9
1960	1,117.3	389.6	1,808.7	349.9	94.5	58.8	29.8	13.1	17.2	29.2	5.5	3.2	5.9	6.7	2.5	0.5	5.9	6.7	2.5	0.5	4.4	1.4
1965	1,533.6	672.3	2,034.8	506.3	134.0	78.6	28.6	15.8	22.0	48.7	3.1	7.1	19.0	27.9	2.4	3.2	19.0	27.9	2.4	3.2	1.7	2.1
1970	2,012.4	1,327.1	2,594.6	1,801.6	122.4	105.7	39.2	80.3	22.0	48.7	3.1	7.1	19.0	27.9	2.4	3.2	19.0	27.9	2.4	3.2	1.7	2.1
1971	1,679.1	1,261.7	2,980.2	2,079.3	104.6	90.9	35.8	66.3	20.0	44.6	3.1	7.2	20.9	29.2	2.4	3.2	20.9	29.2	2.4	3.2	1.6	2.3
1972	2,043.5	1,442.8	2,553.5	1,870.3	110.1	102.6	35.8	83.7	20.5	62.0	3.1	6.8	21.7	29.4	2.5	3.3	21.7	29.4	2.5	3.3	1.1	1.7
1973	2,014.2	1,700.4	3,190.8	2,499.0	119.2	118.5	43.7	107.6	21.1	57.5	3.2	7.5	23.1	32.6	2.5	3.5	23.1	32.6	2.5	3.5	1.1	1.7
1974	1,964.6	3,785.5	3,449.7	3,020.8	133.6	374.7	44.8	151.6	18.6	94.1	2.8	7.7	28.6	44.4	2.7	3.7	28.6	44.4	2.7	3.7	1.0	1.7
1975	2,723.1	2,895.5	3,287.7	2,988.4	133.6	514.1	34.9	145.8	22.2	96.4	3.4	2.8	45.7	74.0	1.8	1.2	45.7	74.0	1.8	1.2	8.1	8.1
1976	3,557.1	2,012.5	4,070.7	3,202.2	139.3	313.4	33.4	125.6	25.5	130.1	0.4	1.0	57.3	137.6	2.6	2.6	57.3	137.6	2.6	2.6	3.3	4.1
1977	3,644.9	4,044.4	3,541.1	6,176.4	150.6	306.2	27.9	105.6	22.5	83.2	0.4	1.1	56.2	153.0	2.7	1.9	56.2	153.0	2.7	1.9	1.3	2.5
1978	4,194.8	4,398.5	3,292.1	3,661.8	129.8	240.1	34.5	125.2	22.2	137.2	1.4	3.2	54.4	109.8	3.3	2.8	54.4	109.8	3.3	2.8	2.4	12.5
1979	4,194.8	8,524.9	3,198.9	3,762.5	148.3	297.0	28.1	189.3	23.2	150.3	1.4	3.2	58.8	190.1	3.9	4.4	58.8	190.1	3.9	4.4	3.7	9.0
1980	4,570.2	9,263.8	3,120.8	4,226.7	157.2	440.5	23.5	105.7	18.5	108.3	0.2	0.7	67.7	240.0	4.4	5.0	67.7	240.0	4.4	5.0	9.5	31.0
1981	4,312.1	6,332.1	3,193.0	8,588.8	120.3	366.1	21.2	128.6	17.9	146.5	0.5	1.8	72.0	251.2	3.6	5.1	72.0	251.2	3.6	5.1	10.6	38.1
1982	3,785.5	5,354.3	3,402.7	6,881.3	119.7	307.4	22.0	113.5	24.8	203.9	0.7	3.1	78.6	182.5	3.6	6.9	78.6	182.5	3.6	6.9	13.0	48.0
1983	3,381.6	3,793.9	3,435.6	7,219.0	89.3	284.3	15.7	166.0	29.1	240.9	0.6	3.1	122.9	269.9	3.4	6.5	122.9	269.9	3.4	6.5	8.9	30.6
1984	2,921.9	12,270.1	3,260.2	11,150.0	88.7	574.1	20.2	302.4	46.1	417.0	0.5	4.8	121.1	547.1	3.3	7.9	121.1	547.1	3.3	7.9	10.1	45.8
1985	2,964.8	12,628.7	2,747.6	9,278.0	83.7	679.8	13.0	264.8	34.0	468.9	0.7	9.3	146.2	786.2	3.3	9.5	146.2	786.2	3.3	9.5	7.7	45.4
1986	3,162.4	4,496.1	2,135.3	7,662.9	82.7	440.6	19.2	298.2	36.8	464.3	8.1	243.0	154.0	499.1	3.4	10.1	36.8	464.3	3.4	10.1	6.4	37.4

Table 5.1 - QUANTITY AND VALUE OF AGRICULTURAL PRODUCTION BY KIND OF CROP, PHILIPPINES: 1950 TO 1986 (continued)  
(Quantity in thousand metric tons; Value in million pesos)

Table S.2 - AGRICULTURAL AREA HARVESTED AND MEAN YIELD, BY KIND OF CROP, PHILIPPINES: 1950 to 1986  
(Area in thousand hectares; mean yield in metric tons per hectare)

Crop year	FOOD CROPS												Other fruits <sup>1</sup> and nuts		Citrus <sup>2</sup>		Rootcrops <sup>3</sup>		Vegetables including onions and potatoes <sup>4</sup>	
	Total area harvested	Palely (rough rice)	Corn (shelled)	Banana	Mango	Pineapple	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	909.0	0.631	97.7	1,652	32.9	0.833	15.2	3,717	48.8	1,652	16.6	1,193	185.5	3,581	20.1	2,612	
1955	6,435.3	2,655.5	1,206	1,388.4	0.555	167.0	1,765	56.2	0.897	25.9	3,985	83.2	1,767	19.7	1,599	272.7	4,400	97.9	1,873	
1960	7,596.0	3,306.5	1,131	1,845.5	0.631	161.5	1,903	52.5	1,097	22.6	5,925	83.1	2,125	22.9	1,891	289.1	4,883	80.7	2,295	
1965	8,252.0	3,199.7	1,248	1,922.8	0.663	220.5	3,106	50.6	2,557	30.1	5,850	70.8	3,153	28.6	2,476	273.7	5,615	53.2	4,060	
1970	8,946.6	3,113.4	1,661	2,419.6	0.830	235.2	3,810	45.5	3,334	28.9	8,076	70.8	4,073	21.3	3,319	252.4	5,215	62.8	4,939	
1971	9,214.8	3,195.0	1,746	2,427.8	0.829	227.1	4,557	40.5	3,395	28.0	8,368	65.1	3,942	19.0	3,300	246.0	4,963	59.5	5,203	
1972	9,490.4	3,332.3	1,598	2,454.3	0.825	243.8	4,020	40.8	3,515	29.6	9,530	70.8	4,763	18.7	3,503	258.5	4,711	65.9	4,537	
1973	9,320.7	3,194.2	1,443	2,350.6	0.784	250.4	4,044	43.6	4,303	27.6	10,630	67.6	4,583	19.0	3,358	266.3	4,583	68.4	5,045	
1974	10,171.4	3,527.8	1,656	2,726.4	0.828	211.8	5,833	43.5	4,402	28.4	11,912	67.1	4,870	19.1	3,225	313.9	4,494	68.8	5,814	
1975	10,800.9	3,632.5	1,627	3,009.9	0.835	233.3	7,227	46.6	5,135	30.5	13,915	67.8	4,976	20.1	3,876	351.2	5,146	75.3	5,904	
1976	11,569.0	3,674.0	1,750	3,193.2	0.851	297.7	7,627	35.8	8,187	35.2	11,929	64.8	5,356	22.3	5,390	400.9	5,347	73.7	6,290	
1977	11,858.7	3,641.4	1,851	3,242.5	0.856	300.4	8,147	36.2	8,497	36.1	11,684	68.3	6,895	22.1	5,701	451.2	6,147	75.6	6,585	
1978	11,895.0	3,601.7	1,989	3,158.1	0.885	284.4	11,066	35.4	9,469	45.3	10,253	65.9	7,684	23.5	5,221	460.7	6,521	78.1	6,713	
1979	12,040.1	3,560.7	2,110	3,252.4	0.930	312.0	11,480	38.7	9,388	54.6	11,073	70.4	8,632	24.9	4,504	480.7	7,424	67.7	6,901	
1980	12,133.0	3,636.8	2,155	3,201.1	0.976	317.6	12,522	39.2	9,622	62.7	20,426	71.7	7,314	28.9	5,241	486.3	7,135	68.8	7,344	
1981	11,950.8	3,459.1	2,233	3,233.7	0.960	311.8	13,063	42.4	8,646	67.0	19,294	72.6	7,139	25.2	5,155	476.6	7,150	66.5	7,553	
1982	12,218.0	3,442.8	2,359	3,360.7	0.979	331.4	12,304	41.3	10,322	60.1	20,667	74.4	7,770	25.8	5,140	479.7	6,616	69.3	7,449	
1983	11,639.6	3,239.6	2,386	3,137.5	0.990	326.0	11,919	42.5	8,823	62.0	27,148	65.1	5,123	25.6	5,080	423.3	4,966	65.2	6,882	
1984	11,738.4	3,140.7	2,497	3,270.2	1.023	317.6	12,024	42.8	8,811	63.0	27,273	63.3	4,999	24.7	5,027	419.3	5,453	65.2	7,241	
1985	11,865.0	3,221.8	2,545	3,314.2	1.037	328.2	11,267	45.4	8,465	54.1	26,776	61.4	4,735	25.1	4,916	421.9	5,815	66.1	7,068	
1986	12,237.2	3,402.6	2,673	3,544.7	1.106	330.1	11,574	48.7	6,079	59.5	26,909	68.2	4,573	26.4	5,007	422.6	6,314	66.8	7,294	

<sup>1</sup>Includes atis, avocado, calamito, cashew, chico, guayabano, jackfruit, lanzones, papaya, pili and watermelon from 1950 to the present. Grapes were included starting 1975.

<sup>2</sup>Includes calamansi, mandarin, orange and pomelo.

<sup>3</sup>Includes camote, cassava, gabi pao (galing), Eugui and ubi.

<sup>4</sup>Vegetables include cabbage, eggplant, garlic, pechay, radish and tomatoes from 1950 to the present. Ginger was included starting 1970.

<sup>5</sup>Includes drybeans and munggo from 1950 to the present. Soybeans were included starting 1970.

<sup>6</sup>Includes other fruits and vegetables.

<sup>7</sup>Includes nuts used for making copra, desiccated coconut, home-made oil and as food from 1950 to the present. Nuts used for commercial manufacturing were included starting 1970.

<sup>8</sup>Includes sugarcane used for centrifugal sugar, muscovado, pango and molasses. <sup>9</sup>Includes kapok from 1950 to the present. Starting 1975, castor beans and cotton (seeded) were added to this category.

Sources: National Economic and Development Authority (formerly NEC), the Raw Materials Resources Survey Bulletin, Series No. 1, June 1959; Agricultural Economics Division, DANR, Crop, Livestock and Natural Resources Statistics; Bureau of Agricultural Economics.

TABLE 5.2. - AGRICULTURAL AREA HARVESTED AND MEAN YIELD, BY KIND OF CROP, PHILIPPINES: 1950 TO 1986 (continued)  
(Area in thousand hectares; mean yield in metric tons per hectare)

Crop Year	FOOD CROPS												Commercial Crops															
	Beans and peas <sup>1</sup>		Coffee		Cacao		Peanuts (unshelled)		Other food crops <sup>6</sup>		Coconut <sup>7</sup>		Sugarcane <sup>8</sup>		Abaca		Native tobacco		Virginia tobacco		Rice		Rubber		Majury		Other crops - Giant crops	
	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	Area	Mean Yield	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	34.0	0.453	9.8	0.408	4.0	0.175	21.0	0.586	0.5	2.200	985.0	0.859	139.5	5.050	291.5	0.282	45.1	0.573	15.5	0.552	2.9	0.586	3.4	0.382	7.0	0.257	4.6	26.826
1955	67.7	0.591	19.2	0.365	6.5	0.231	28.4	0.620	2.2	2.136	199.0	1.154	257.7	5.777	217.0	0.482	37.1	0.578	15.7	0.552	2.9	0.586	5.0	0.400	4.0	0.050	5.6	43.788
1960	78.2	0.541	10.2	0.806	6.0	0.470	24.1	0.610	4.0	2.050	1659.0	1.055	242.2	7.468	175.2	0.538	44.1	0.576	15.7	0.552	2.9	0.586	5.2	0.596	2.9	0.724	5.6	41.786
1965	58.0	0.429	44.3	0.895	9.0	0.433	24.1	0.548	11.7	4.342	1804.7	0.856	320.5	5.895	199.3	0.572	47.3	0.605	28.8	0.597	3.2	1.219	17.0	0.347	2.7	0.925	3.1	0.685
1970	50.0	0.460	44.0	0.907	8.4	0.312	32.5	0.535	11.7	5.812	1893.9	1.068	366.1	7.087	173.0	0.708	54.0	0.726	33.4	0.659	2.4	1.292	21.8	0.872	2.8	0.857	2.7	0.630
1971	49.2	0.480	54.3	0.912	7.4	0.486	32.5	0.582	12.9	6.140	2048.5	0.820	441.6	6.749	155.3	0.674	46.6	0.768	29.0	0.690	2.4	1.292	23.0	0.809	2.7	0.889	2.4	0.667
1972	48.4	0.520	54.8	0.942	6.9	0.507	32.5	0.578	15.9	6.497	2126.2	0.851	441.6	5.790	145.2	0.758	45.7	0.793	31.9	0.643	2.4	1.292	24.7	0.879	2.6	0.962	1.7	0.647
1973	46.7	0.565	60.8	0.877	7.1	0.507	32.2	0.548	15.9	6.592	2131.3	0.841	455.2	7.010	163.3	0.710	51.9	0.842	32.1	0.657	2.4	1.292	26.1	0.885	2.6	0.962	1.4	0.786
1974	44.5	0.517	65.3	0.917	6.8	0.594	36.2	0.588	18.1	6.818	2202.0	0.881	490.7	7.030	170.1	0.740	48.6	0.785	28.5	0.653	2.2	1.273	33.2	0.861	2.6	1.038	1.2	0.833
1975	55.3	0.631	65.4	1.198	6.8	0.500	54.8	0.661	20.8	6.032	2279.3	1.195	536.1	6.133	179.7	0.743	48.7	0.717	36.0	0.617	1.4	1.000	45.4	1.007	2.5	0.720	1.5	5.430
1976	62.6	0.654	76.8	1.052	6.0	0.800	60.6	0.672	83.6	1.457	2521.2	1.411	572.6	7.108	242.8	0.671	51.9	0.644	34.4	0.741	0.2	2.000	55.1	1.040	2.7	0.963	1.5	2.200
1977	61.8	0.664	76.2	1.170	4.9	0.659	62.7	0.737	88.1	1.593	2728.2	1.408	573.2	6.176	250.3	0.602	45.2	0.617	30.8	0.731	0.2	2.000	58.5	0.995	2.6	1.038	1.7	0.765
1978	61.1	0.651	86.5	1.406	4.2	0.738	47.9	0.789	85.1	1.600	2856.0	1.418	521.6	6.293	243.8	0.532	43.3	0.797	30.5	0.728	0.3	4.667	53.7	0.943	3.5	0.686	3.5	0.686
1979	62.9	0.671	96.2	1.213	4.5	0.844	52.0	0.914	85.2	4.080	3063.6	1.402	451.2	7.090	234.7	0.632	37.3	0.753	29.5	0.784	0.3	4.667	53.7	1.095	3.8	1.036	2.5	1.480
1980	66.5	0.711	101.8	1.221	4.7	0.872	55.1	0.906	84.9	4.558	3125.9	1.462	424.6	7.350	235.9	0.666	36.7	0.640	24.4	0.758	0.3	4.667	54.1	1.251	3.3	1.333	5.7	1.667
1981	68.6	0.707	118.7	1.236	7.4	0.568	38.7	0.765	87.4	4.551	3105.3	1.389	421.1	7.583	230.1	0.558	32.6	0.650	22.6	0.792	0.5	1.000	53.9	1.336	3.3	1.091	10.7	0.991
1982	68.4	0.725	125.7	1.263	10.9	0.486	56.5	0.860	88.3	4.812	3162.3	1.397	470.8	7.237	205.8	0.579	31.2	0.663	23.9	1.038	0.7	1.000	56.9	1.381	3.3	1.091	11.8	1.102
1983	67.3	0.783	127.3	1.070	11.3	0.484	47.8	0.750	78.9	4.247	3187.4	1.061	423.6	6.117	170.3	0.524	24.8	0.640	26.9	1.007	0.6	1.000	64.2	1.912	3.2	1.053	7.3	1.222
1984	48.2	0.782	140.2	0.833	11.9	0.475	48.0	0.917	77.3	4.527	3216.1	0.908	478.4	6.601	170.3	0.521	25.0	0.776	40.7	1.131	0.6	0.886	64.4	1.912	3.2	1.053	7.2	1.483
1985	51.3	0.803	145.5	0.917	12.7	0.402	50.2	0.900	60.3	4.358	3274.9	0.905	407.1	6.749	159.5	0.494	17.0	0.765	34.4	0.990	0.7	1.000	71.8	2.036	3.1	1.064	6.4	1.263
1986	49.6	0.750	147.6	0.923	15.3	0.405	48.9	0.879	61.7	4.402	3261.5	0.959	355.9	5.999	161.5	0.512	22.4	0.857	34.4	1.069	3.4	2.382	75.3	2.045	3.2	1.062	5.5	1.163



Table 5.3a - AREA OF FARMS BY LAND USE, PHILIPPINES:  
1971 and 1980

Land use	1971		1980	
	Area (hectares)	Per cent	Area (hectares)	Per cent
Total	8,493,735	100.00	9,034,354	100.00
Arable land	3,891,982	45.82	4,487,679	49.56
Planted to permanent crops	2,532,166	29.80	3,313,054	36.67
Lying idle	752,272	8.86	-	-
Under permanent meadows and pastures	690,988	8.14	610,125	6.75
Covered with forest growth	433,707	5.11	623,496	7.02
All other lands	192,620	2.27		

Source: National Census and Statistics Office,  
1971 and 1980 Censuses of Agriculture.

Table 5.5 - SIZE OF FARMS BY MAJOR CATEGORY, PHILIPPINES: 1971 AND 1980

Item	Number of farms (in thousands)		Area of farms (thousand hectares)	
	1971	1980	1971	1980
All Farms	2,354.5	3,420.1	8,493.7	9,725.2
Palay	981.9	1,610.5	2,661.2	3,755.7
Corn	514.2	753.6	1,493.9	1,955.0
Coconut	432.5	709.6	2,152.8	2,842.9
Sugarcane	27.0	34.6	368.1	312.8
Abaca	12.5	16.0	64.3	60.1
Tobacco	3.9	5.3	7.3	8.1
Other crops	-	227.3	-	576.0
Livestock and Poultry <sup>1</sup>	38.3	52.2	415.6	181.6
Others, nec.	344.2	11.0	1,330.5	33.0

<sup>1</sup>Includes chicken, hog, and cattle.  
Source: National Census and Statistics Office,  
1971 and 1980 Censuses of Agriculture.

Figure 7.1  
DIRECTION OF EXTERNAL TRADE: 1977 TO 1986

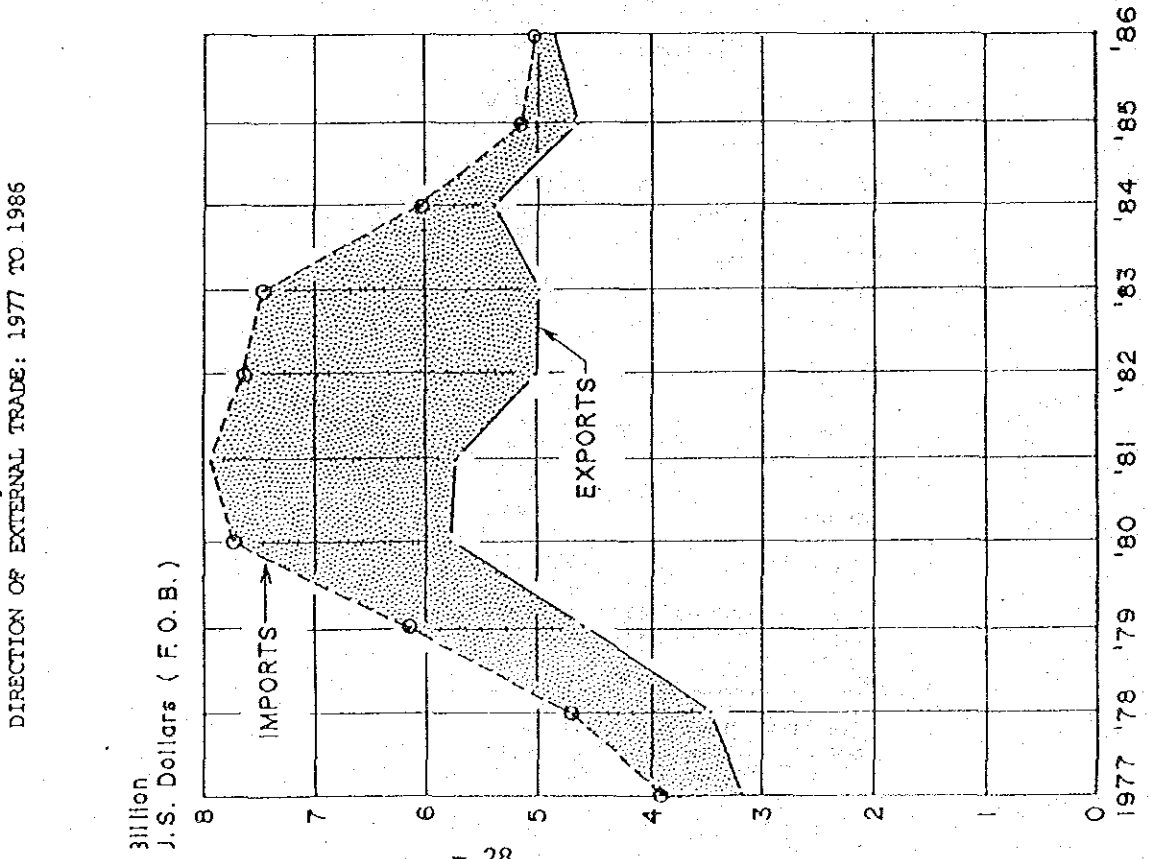


Figure 7.3  
EXTERNAL TRADE IMPORTS: 1976 TO 1986

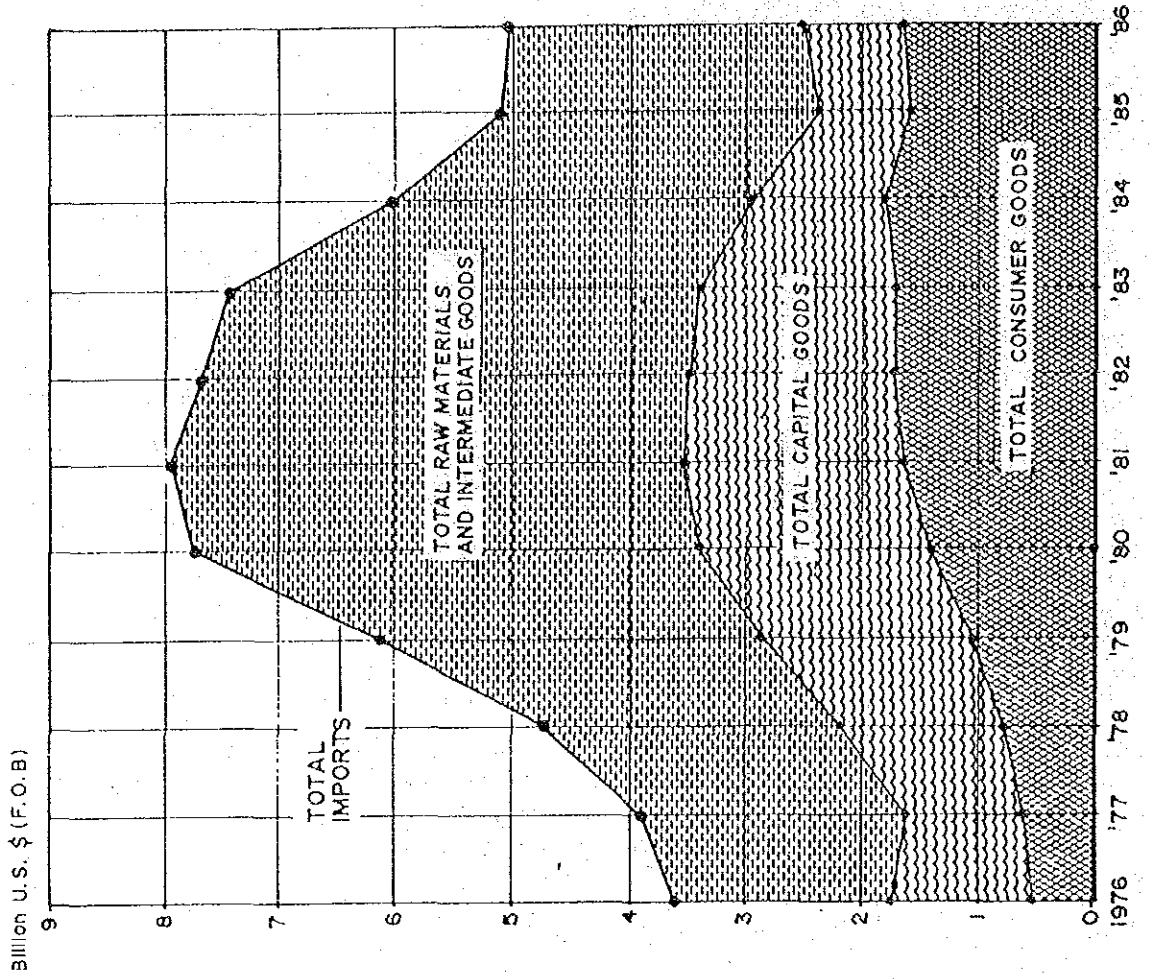


Table 7.1-FOREIGN TRADE OF THE PHILIPPINES: 1935 to 1986  
(F.O.B. value in million U.S. dollars)

Year	Exports <sup>1</sup>			Imports			Balance of trade:	
	Total trade	Value	Percent to total trade	Average exchange rate (P/U.S.\$)	Value	Percent to total trade	Average exchange rate (P/U.S.\$)	Favorable(+) Unfavorable(-)
1935	187.47	101.93	54.37	2.000	85.54	45.63	2.000	16.39
1940	290.65	155.92	53.65	2.000	134.73	46.35	2.000	21.19
1945	29.60	0.67	2.26	2.000	28.93	97.74	2.000	(28.26)
1950	688.88	332.70	48.30	2.000	356.18	51.70	2.000	(23.48)
1955	955.60	419.26	43.87	2.000	536.34	56.13	2.000	(117.08)
1960	1,159.96	535.44	46.16	2.000	624.52	53.84	2.000	(89.08)
1965	1,630.99	795.74	48.79	3.900	835.25	51.21	3.874	(39.51)
1970	2,301.49	1,142.19	49.63	5.729	1,159.30	50.37	5.764	(17.11)
1971	2,450.08	1,189.25	48.54	6.305	1,260.83	51.46	6.391	(71.58)
1972	2,502.03	1,168.43	46.70	6.682	1,333.60	53.30	6.605	(165.17)
1973	3,433.81	1,837.19	53.50	6.755	1,596.62	46.50	6.754	240.57
1974	5,868.25	2,724.99	46.44	6.791	3,143.26	53.56	6.772	(418.27)
1975	5,753.65	2,294.47	39.88	7.238	3,459.18	60.12	7.230	(1,164.71)
1976	6,207.16	2,573.68	41.46	7.384	3,633.48	58.54	7.466	(1,059.80)
1977	7,065.65	3,150.89	44.59	7.346	3,914.76	55.41	7.436	(763.87)
1978	8,157.07	3,424.87	41.99	7.314	4,732.20	58.01	7.392	(1,307.33)
1979	10,742.94	4,601.19	42.83	7.323	6,141.75	57.17	7.400	(1,540.56)
1980	13,514.70	5,787.79	42.83	7.454	7,726.91	57.17	7.508	1,939.12
1981	13,666.08	5,720.40	41.87	7.834	7,945.68	58.13	7.856	(2,225.28)
1982	12,687.51	5,020.59	39.57	8.463	7,666.92	60.43	8.484	(2,646.33)
1983	12,491.92	5,005.29	40.07	11.125	7,486.63	59.93	10.989	(2,481.34)
1984	11,460.26	5,390.65	47.04	16.570	6,069.61	52.96	16.700	(678.96)
1985	9,739.62	4,628.95	47.53	18.535	5,110.67	52.47	18.738	(481.72)
1986	9,885.38	4,841.78	48.98	20.259	5,043.60	51.02	20.403	(201.82)

<sup>1</sup>Sum of domestic exports and re-exports.  
Source: National Census and Statistics Office.

Table 7.3- PHILIPPINE EXPORTS BY MAJOR COMMODITY GROUP : 1960 TO 1986  
(F.O.B. value in million U.S. dollars)

Major commodity group	1960	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total	535	796	1,142	1,189	1,168	1,837	2,725	2,294	2,574	3,151	3,425	4,601	5,788	5,720	5,021	5,005	5,391	4,629	4,842
Coconut products	177	271	212	254	228	374	609	466	540	761	908	1,024	811	750	590	680	727	459	470
Copro	139	170	81	114	110	166	140	172	150	201	136	89	47	34	49	4	-	-	18
Coconut oil	16	59	98	103	84	153	381	231	299	412	621	742	567	533	401	516	580	347	333
Desiccated coconut	19	20	19	21	18	32	60	30	37	90	82	107	116	102	68	88	106	76	44
Copro meal or cake	3	12	14	16	16	23	28	33	54	58	69	86	81	81	72	72	41	36	75
Sugar and sugar products	135	147	196	220	218	294	766	616	456	535	216	240	657	609	445	321	327	189	108
Centrifugal and refined sugar	133	132	188	212	211	274	737	581	429	512	197	212	624	567	416	299	290	169	87
Molasses	2	10	8	8	6	19	28	34	24	20	16	27	33	38	25	17	33	16	16
Others	*	5	*	*	1	1	1	1	3	3	3	1	-	4	4	5	4	4	5
Forest products	95	195	301	264	235	444	338	260	308	294	362	536	468	469	362	331	323	246	251
Logs	85	155	243	215	164	304	216	167	135	134	145	144	92	76	78	74	88	39	26
Lumber	7	6	13	11	10	35	30	27	68	87	85	198	181	126	124	149	107	90	103
Plywood	2	18	20	24	34	58	26	21	43	41	72	107	111	111	67	76	56	51	56
Others	1	14	25	14	27	47	66	45	62	52	60	87	84	156	93	32	72	66	66
Mineral products	37	70	224	224	239	374	518	332	371	501	554	831	1,031	758	532	440	266	243	267
Copper concentrates	30	47	185	185	191	290	393	212	266	288	250	440	545	429	312	249	115	84	90
Gold	...	...	8	8	27	40	74	76	65	71	76	103	239	215	169	154	104	100	140
Iron ore and concentrates	*	2	13	13	9	18	12	13	7	-	-	-	-	-	-	-	-	-	-
Chromite ore	5	11	9	6	5	9	13	13	15	25	25	23	33	25	15	10	19	12	10
Others	2	10	17	12	7	17	26	18	18	137	203	265	214	89	36	27	28	47	27
Fruits and vegetables	25	17	35	41	52	57	91	124	142	157	177	214	365	378	374	327	392	354	346
Pineapple products	7	12	22	20	21	23	35	41	52	64	74	96	97	101	107	102	115	128	128
Banana	18	2	6	15	24	28	45	73	76	72	86	100	114	124	146	105	122	113	130
Others	*	3	7	6	7	6	11	10	14	21	17	18	154	153	121	120	155	113	98
Abaca products	43	26	17	15	16	24	46	22	27	29	25	28	31	25	26	25	27	31	35
Abaca unmanufactured	42	24	15	13	13	20	38	15	18	18	15	25	27	21	20	18	33	16	13
Abaca rope	1	2	2	2	3	4	8	7	9	11	10	13	4	4	6	7	4	15	22
Tobacco products	3	16	15	15	18	27	31	35	29	29	30	33	30	50	49	35	31	28	26
Raw tobacco	3	15	14	14	17	26	30	34	28	28	29	32	29	48	47	33	28	24	21
Cigars and others	*	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	3	4	5
Mineral fuel and lubricants	*	6	17	24	19	16	17	37	34	37	30	42	38	42	33	115	87	42	66
Chemicals	2	2	5	6	6	10	15	21	26	51	59	112	89	107	96	87	104	151	243
Textiles	3	5	5	7	9	24	20	22	28	21	31	39	33	69	56	25	38	39	44
Miscellaneous manufactures and others	14	39	114	111	124	191	271	357	589	722	1,011	1,463	2,198	2,453	2,449	2,586	2,934	2,807	2,874
Re-exports	1	2	1	8	4	2	3	2	24	14	22	25	37	10	9	33	125	40	112

Source: National Census and Statistics Office.

Table 15.3 - NATIONAL GOVERNMENT EXPENDITURE PROGRAM BY SECTOR, OBLIGATION BASIS: 1977 to 1986  
(In million pesos)

PARTICULARS	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Total expenditures	22,253	27,808	33,227	37,404	48,154	48,924	53,418	59,024	74,958	91,372
Economic services	7,975	11,272	13,176	14,523	18,773	16,981	15,700	13,748	18,585	18,053
Agriculture	1,724	2,753	1,466	2,289	3,241	3,889	3,534	3,395	4,045	4,414
Industry, trade, labor and tourism	618	960	987	1,305	2,759	2,275	1,905	1,370	1,585	1,223
Utilities and infrastructure	5,633	7,559	10,723	10,929	12,773	10,817	10,261	8,983	12,955	12,416
Social services	4,269	5,350	6,619	7,807	10,736	11,160	12,037	12,916	15,398	22,030
Education	2,740	3,582	3,995	4,762	5,806	6,413	6,263	7,830	10,268	10,856
Health	957	962	1,248	1,390	1,734	2,136	2,485	2,308	2,802	3,651
Social security and welfare	411	526	574	721	1,907	1,238	1,418	1,384	1,582	6,143
Housing and community development	161	280	802	934	1,289	1,373	1,671	1,394	746	1,380
Defense	4,554	4,542	4,887	4,975	5,447	5,951	6,526	6,341	8,143	8,006
General public service	3,621	4,611	5,714	6,516	9,301	9,940	10,707	11,022	14,081	15,349
Debt service fund	1,834	2,033	2,831	3,583	3,897	4,892	8,448	14,997	18,751	27,934

Notes: 1. Bureau of the Treasury's figures for debt service were adopted.

2. Sectoral allocation of DMW-Omin was based on the 1985 infrastructure distribution per 1986 BRE.

3. Transfers to government corporations and local government units are actual obligations.

Source: Department of Budget and Management.

Table 15.8 - CASH RELEASES ON INFRASTRUCTURE PROGRAM FROM FOREIGN SOURCES: 1976 to 1986  
(in million pesos)

Programs and projects	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Cash releases from foreign sources	223.3	532.1	520.1	577.6	795.7	964.7	991.4	1,178.6	524.5	354.0	149.9
Highways	22.4	85.2	26.5	17.6	35.2	64.9	72.0	112.5	31.2	19.2	15.2
Airports and air navigations	0.5	3.0	0.0	7.4	3.4	26.5	0.0	0.0	-	-	-
Railways	-	-	-	-	-	6.5	-	-	-	-	-
Port works and shore protection	1.9	5.4	6.8	4.5	4.7	38.1	4.7	34.1	0.1	19.8	12.4
Irrigation	8.6	38.8	125.0	82.1	45.2	50.9	48.0	106.0	73.2	-	18.1
Waterworks, wells and spring (BPW)	0.0	0.0	0.0	1.0	68.4	95.2	14.0	108.7	0.2	0.9	0.2
Waterworks (LWUA)	4.4	5.4	11.5	0.0	0.0	20.2	29.0	19.0	-	-	-
Water Supply & Sewerage (MWSS)	1.8	16.2	16.8	0.0	68.4	81.7	126.8	-	18.0	-	12.9
Flood control and drainage	9.4	10.4	0.0	6.5	1.3	5.8	6.0	6.0	-	0.6	0.8
Power generation and transmission	136.9	315.6	252.6	406.4	519.1	488.7	603.0	712.5	399.3	307.0	90.3
Rural electrification	30.7	31.1	14.7	19.4	40.2	73.4	68.0	59.2	-	-	-
Telecommunication	0.0	0.0	0.0	0.9	0.0	0.0	0.3	5.8	-	-	-
School buildings	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
National buildings and hospitals	0.0	0.0	0.0	0.0	0.1	0.0	3.6	0.0	-	-	-
Rural Health Units	0.9	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-	-	-
Education Development Projects (EDP/TAP)	0.0	0.0	2.3	10.8	0.0	0.0	0.0	0.0	-	-	-
Miscellaneous public works	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Export Processing Zone (EPZA)	0.1	10.0	0.0	13.0	0.0	0.0	0.0	0.0	-	-	-
Preliminary engineering and studies	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Miscellaneous projects (LLDA)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Torco Foreshore Dev't (TFDA-NHA)	0.0	0.0	5.2	0.4	0.0	0.0	0.0	0.0	-	-	-
Warehousing project	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Public works contract price adjustments	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-
Phil-Australian Dev't Assistance Program (PADAP)	5.7	5.3	0.0	0.0	0.0	0.0	0.0	6.2	-	-	-
Farm System Dev't Corporation	0.0	0.7	0.0	0.0	0.0	5.5	2.0	0.0	2.4	-	-
PW contract adjustment	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	-	-	-
MUDP-NHA	0.0	5.0	51.6	0.0	0.1	0.0	0.0	0.0	-	-	-
BPI-Infra Component	0.0	0.0	0.0	4.1	5.4	0.0	0.0	0.0	-	-	-
Mar-Infra Component	0.0	0.0	0.0	3.5	2.3	0.0	0.0	0.0	-	-	-
Flood forecasting (PAGASA)	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	-	-	-
Metrofinds	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-	-	-
WMinute	0.0	0.0	0.0	0.0	0.5	5.0	1.0	5.6	-	0.3	-
Manteam	0.0	0.0	0.0	0.0	0.0	2.3	1.0	2.5	0.1	-	-
Premiumed RCDP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	-	-	-
Lightrail	-	-	-	-	0.0	0.0	12.0	0.0	-	-	-
Energy Development	-	-	-	-	0.0	0.0	-	-	-	6.2	-

Source: Project Monitoring Staff, NEDA.

Table 15.7 - TOTAL AGRICULTURAL CREDITS GRANTED BY DEVELOPMENT BANKS, CLASSIFIED BY PRODUCTS: 1965 TO 1986  
(In thousand pesos)

Period	Total	Palay or rice		Sugar	Corn	Coconut	Tobacco	Coffee and cocoa	Cassava root & other	Abaca	Ramie	Other fibers	Citrus	Pine-apple	Other fruits and vegetables	Salt	Livestock and poultry	Hunting traps & game protection	Fertilizer and seedlings	Farm implements	Rubber plantation	Rice production (paper)	Chicken and poultry feed	Grains and storage	Others	
		1965	1970																							
1965	51,667	15,506	7,420	843	10,962	285	441	13	924	12	23	592	5	1,016	268	11,583	1965	635	2,137	107	-	-	-	-	-	895
1970	60,436	19,814	9,395	1,180	12,764	460	155	53	63	-	-	132	120	920	368	12,615	1970	11	894	516	471	-	-	-	-	505
1975	618,105	239,945	30,387	17,993	47,330	784	1,455	74	7,554	210	6	3,331	-	8,181	212	234,973	1975	181	2,671	3,016	2,747	4,619	187	2,615	-	9,655
1976	676,549	277,741	33,013	47,668	539	2,024	1,455	10	11,514	43	264	2,217	-	15,985	184	222,271	1976	72	2,740	11,112	9,684	399	42	50	-	14,288
1977	572,972	223,868	17,868	36,446	57,314	373	2,318	91	7,404	7	171	1,744	504	7,742	73	155,490	1977	8	2,014	4,227	7,964	3,227	749	45	-	8,541
1978	520,513	133,370	12,062	52,140	62,782	203	5,873	479	2,663	5	320	1,669	42,864	5,043	457	129,963	1978	10	2,743	3,796	16,769	3,956	1,338	15	-	35,578
1979	730,949	94,291	8,559	22,364	61,769	395	6,769	127,003	1,799	5	1,163	2,275	1,109	8,155	514	184,251	1979	102	2,295	2,887	12,603	3,845	1,070	120	-	27,370
1980	696,657	86,747	9,964	14,846	61,681	341	21,545	10,319	1,703	96	974	2,046	181	6,872	1,194	290,616	1980	407	4,448	5,651	30,868	29,693	326	-	-	66,448
1981	226,666	70,824	12,837	1,137	21,008	243	4,019	358	1,634	778	20	482	520	1,634	778	75,965	1981	563	7,072	7,117	6,084	6,437	15	-	-	21,463
1982	819,300	200,849	27,000	9,491	65,062	1,033	11,520	2,930	1,406	50	1,688	986	684	7,824	3,351	227,577	1982	8	11,055	4,783	9,283	3,243	-	-	-	27,468
1983	373,949	99,059	20,571	4,097	21,915	547	8,762	784	433	135	3,769	1,002	684	1,597	3,280	137,969	1983	10	12,955	2,889	9,555	13	-	-	-	142,823
1984	330,169	41,605	22,779	53	6,304	97	2,785	1,007	-	-	500	326	-	8,853	348	73,967	1984	1,425	30,193	12,441	1,914	-	-	-	-	1,098
1985	308,516	48,486	49,364	898	10,847	337	7,914	663	589	10	11	414	137	9,670	2,513	103,967	1985	4,197	5,123	102	182	-	-	-	-	61,989
1986	760,187	185,843	58,574	3,589	23,775	173	8,209	2,355	835	2,100	9	1,834	7,500	5,619	1,103	160,230	1986	67	257	-	-	-	-	-	-	205,380
January	36,261	6,080	11,374	35	989	13	1,427	94	-	-	9	37	-	31	338	6,757	January	-	35	182	8	-	-	-	-	6,753
February	31,400	4,436	6,748	80	1,008	80	1,413	52	60	-	-	39	-	506	6	11,694	February	-	24	2,757	-	-	-	-	-	1,034
March	55,602	3,536	8,073	60	948	23	1,414	53	60	-	-	9	-	50	6	5,767	March	-	142	1,932	-	-	-	-	-	32,822
April	62,241	5,947	19,162	-	1,044	23	1,366	50	60	-	-	9	-	50	6	5,767	April	-	321	2,483	-	-	-	-	-	20,876
May	46,008	7,564	8,442	88	2,301	-	1,465	53	123	-	-	81	-	318	54	8,396	May	-	342	836	-	-	-	-	-	14,299
June	43,573	9,511	8,445	-	1,991	-	182	1,500	-	-	-	-	-	609	54	15,629	June	-	4,125	635	464	-	-	-	-	1,532
July	78,413	7,600	5,659	153	3,735	-	157	1,500	123	-	-	-	3,500	651	54	15,629	July	-	844	156	-	-	-	-	-	46,644
August	59,488	11,636	7,483	205	3,513	-	230	500	123	-	-	110	4,000	789	454	6,433	August	-	9,827	877	422	-	-	-	-	39,228
September	123,303	13,668	833	368	3,892	81	1,600	53	55	-	-	596	-	435	54	7,323	September	-	13,106	709	800	-	-	-	-	8,529
October	76,104	19,226	9,846	1,254	3,304	-	185	54	54	-	-	289	-	1,115	6	17,411	October	-	4,850	1,788	584	-	-	-	-	12,186
November	147,417	96,661	10,407	908	1,030	30	210	-	54	2,100	-	221	-	1,115	6	15,147	November	-	-	-	-	-	-	-	-	-
December	147,417	96,661	10,407	908	1,030	30	210	-	54	2,100	-	221	-	1,115	6	15,147	December	-	-	-	-	-	-	-	-	-

This consists of the Development Bank of the Philippines and Private Banks before adjustments (reduction and/or cancellation of loan approval).  
 1. Includes mango, soybeans and cotton.  
 2. Includes started in 1977.  
 Source: Central Bank of the Philippines.

3-2 OTHER INFORMATION AND DATA

GEOLOGIC & LABORATORY TEST RESULTS ON  
THE SUB-SURFACE INVESTIGATIONS CONDUCTED  
FOR THE PROPOSED NIA DIVERSIFIED CROPS  
IRRIGATION ENGINEERING CENTER

September 1987

CONSTRUCTION & DRILLING SPECIALISTS, INC.  
Room 250, Cityland Condominium IV  
124 Valero Street, Salcedo Village  
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## SUMMARY

### I. INTRODUCTION

Sub-surface soil investigation was conducted at the site of the proposed NIA Diversified Crops Irrigation Engineering Center in Diliman, Quezon City to establish the presence, locations and extent of good soil suitable for foundation support and to determine the possible existence and extent of poor soil that could pose an adverse effect on the foundation performance. The investigation consisted of soil testing by both wash boring and diamond core drilling methods and selected samples were collected and subjected to laboratory tests. As revealed in the investigations, the proposed site is underlain by a relatively sound rock with a thin covering of weathered materials which normally occur from 0-1.50 meters deep. Generally, the sub-surface geology consists of moderately hard to hard interbeds of claystone and siltstone at upper sections with sandstone and tuff prevailing at lower depth.

### II. DRILLING PROCEDURE

A total of six (6) holes with an aggregate depth of 203 meters was drilled at the proposed site, and the locations of which are plotted in Fig. 1. Initially, all the boreholes were advanced by wash boring procedure and standard penetration test (SPT) was conducted at 1.50 meter interval. The SPT consisted of driving a standard split spoon sampler of 5.08 cm. (2"O.D.) in three successive 15 cm. (6") intervals using a drop hammer of 64kg. weight from

a height of 76 cm. The number of blows to penetrate 15 cm. are recorded successively until the third interval is penetrated. The first interval blow count is considered as the seating drive and is discarded. The last two blow counts from the second and third intervals are added to give what is known as the N value which is a measure of the density or consistency of the underlying soils.

As the rocks became harder for wash boring methods, coring by diamond drilling was resorted to and core samples recovered were laid out in well-labelled core boxes. No soft cohesive soil was encountered throughout the investigations so that no undisturbed sampling by shelby tube was conducted. The following are the completed boreholes with their corresponding depth:

BH - 1	-----	24.50 m.
BH - 2	-----	24.50 m.
BH - 3	-----	60.00 m.
BH - 4	-----	32.00 m.
BH - 5	-----	30.00 m.
BH - 6	-----	<u>32.00 m.</u>
		203.00 m.
		=====

Where core samples are lost as in the case of a loosely-consolidated sandstone from 20.00 - 24.50 meters in BH-2, wash boring was again utilized and SPT was conducted at proper intervals. N values at this formation are however high ranging from N = 45 to N > 50.

### III. LABORATORY TEST RESULTS

As no unconsolidated materials were uncovered, only core samples were taken and subjected to the laboratory test. The following core samples were selected by NIA for the unconfined compression test:

<u>BOREHOLE NO.</u>	<u>DEPTHS</u>
BH - 1 -----	9.20 m. 18.80 m.
BH - 2 -----	4.50 m. 8.00 m. 13.00 m. 16.00 m. 19.00 m.
BH - 3 -----	7.70 m. 10.80 m. 15.50 m. 18.50 m. 23.30 m. 27.50 m. 37.00 m. 48.00 m.
BH - 4 -----	4.90 m. 7.80 m. 10.00 m. 14.40 m.
BH - 5 -----	4.70 m. 8.15 m. 14.50 m. 17.00 m.
BH - 6 -----	6.00 m. (2 tests) 14.20 m. 20.50 m.

LEGEND:

- |                            |                      |                   |
|----------------------------|----------------------|-------------------|
| A - BUILDING A             | M - HOLIDAY          | O - ANTENNA TOWER |
| B - BUILDING B             | I - PAINTING ROOM    | HT. = 20 M.       |
| C - ANNEX BUILDING         | J - PELOTA COURT     | P - DIESEL        |
| D - COVERED PARKING        | K - SECURITY QUARTER | GENERATOR         |
| E - POWER HOUSE            | L - GUARD HOUSE      | HOUSE             |
| F - SEWAGE TREATMENT PLANT | M - COVERED WALK     | O - SUB-STATION   |
| G - GAS PUMP               | N - STORAGE ROOM     | R - REPAIR SHED   |

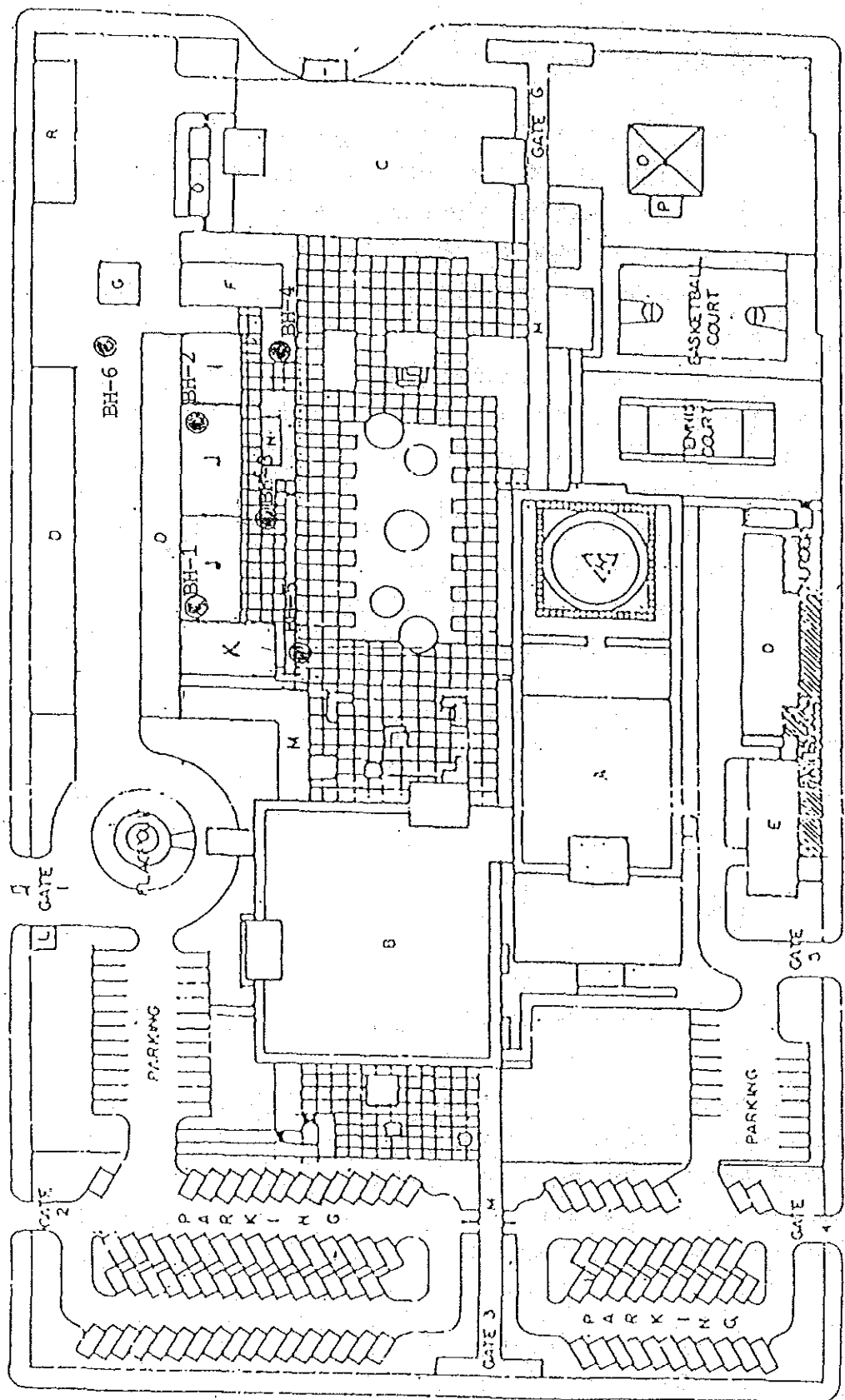


Fig. 1. Location of Borocholes  
 and Diversified Crops Irrigation Engineering Center  
 SITE DEVELOPMENT PLAN  
 SCALE: 1:1000  
 MTS.

G E O L O G I C   L O G S   O F   B O R E H O L E S



ject

NIA IRRIGATION CENTER

Hole No. BH-1

SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH meters	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
	20.00 - 24.50 m. WASH BORING		S O C F S							SPT #6
										SPT #7
										SPT #8
	BOTTOM OF HOLE: 24.50 m.	25								
		30								
		35								
		40								

CONSTRUCTION & DRILLING SPECIALISTS, INC.

BOREHOLE LOG

Project NIA IRRIGATION CENTER  
 Location NIA COMPOUND, EDSA, Q.C.  
 Client \_\_\_\_\_  
 Ground Elevation \_\_\_\_\_

Hole No. 2 Depth 24.50 m.  
 Date Started September 18, 1987  
 Date Completed September 19, 1987  
 Depth to Ground Water 1.80 m.

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH (meters)	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
NQ	0.00 - 1.50 m. Concrete flooring over foundation gravel									
	1.50 - 4.75 m. WASH BORING									SPT #9 SPT #10 SPT #11 UCT #3 (4.50 m.)
	4.75 - 5.60 m. SILTSTONE. Hard	5								
	5.60 - 7.20 m. CLAYSTONE. Yellowish gray; Hard									
	7.20 - 9.90 m. SANDSTONE. Fine-grained; Hard; Yellowish gray.									UCT #4 (8.00 m.)
	9.90 - 12.40 m. Coring but lost core samples.	10								No return water
	12.40 - 20.00 m. TUFF. Grayish to Black. Hard	15								SPT #12 UCT #5 (13.00 m.) UCT #6 (16.00 m.) UCT #7 (19.00 m.)
	20									




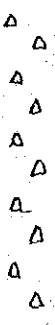
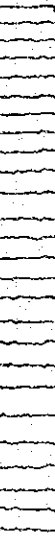
Project NIA IRRIGATION CENTER

Hole No. BII-2

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH meters	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
	20.00 - 24.50 m. SANDSTONE. Loosely-consolidated. Black; Tuffaceous.		●●●●							SPT #13  SPT #14  SPT #15
	BOTTOM OF HOLE: 24.50 m.	25								
		30								
		35								
		40								



GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH meters	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
					10	20	30	40	
TUFF		Δ Δ Δ Δ Δ							
23.60 - 38.00 m.	25								UCT #12 (23.30 m.)
Interbeds of claystone and siltstone. Gray. Hard.	30								UCT # (27.50 m.)
	35								UCT #14 (37.00 m.)
TUFFACEOUS SANDSTONE.		Δ Δ							
38.40 - 41.50 m. TUFF. Gray. Hard	40	Δ Δ Δ Δ							
41.50 - 47.00 m.									
MUDSTONE.									

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH (meters)	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
NO	MUDSTONE. Hard	45								
	47.00 - 52.00 m. TUFF. Grayish to Black. Hard	50								UCT #15 (48.00 m)
	52.00 - 60.00 m. MUDSTONE. Greenish to Buff. Hard.	55								
	BOTTOM OF HOLE: 60.00 m.	60								

CONSTRUCTION & DRILLING SPECIALISTS, INC.

BOREHOLE LOG

Project NIA IRRIGATION CENTER Hole No. BH-4 Depth 32.00 m.  
 Location NIA COMPOUND, EDSA, Q.C. Date Started September 25, 1987  
 Content \_\_\_\_\_ Date Completed September 26, 1987  
 Ground Elevation \_\_\_\_\_ Depth to Ground Water 6.70 m.

DEPTH (meters)	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
				10	20	30	40	
0.00 - 3.00 m.	EGG SHELLS							SPT #17
3.00 - 9.60 m.	CLAYSTONE. Greenish to Buff. Hard							SPT #18 UCT #16(4.90 m.)
9.60 - 14.90 m.	SANDSTONE. Tuffaceous. Hard							UCT #17(7.80 m.) UCT #18(10.00 m.)
14.90 - 17.00 m.	MUDSTONE. Greenish. Calcareous. Medium. Hard							UCT #19(14.40 m.)
17.00 - 27.00 m.	SANDSTONE. Black,							



CONSTRUCTION & DRILLING SPECIALISTS, INC.

BOREHOLE LOG

Project NIA IRRIGATION CENTER Hole No. BH-5 Depth 30.00 m.  
 Location NIA COMPOUND, EDSA, Q.C. Date Started September 26, 1987  
 Client \_\_\_\_\_ Date Completed September 27, 1987  
 Ground Elevation \_\_\_\_\_ Depth to Ground Water 6.50 m.

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH (meters)	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS		
						10	20	30	40			
NQ	0.00 - 1.50 m. Concrete flooring with foundation gravel		•••••								SPT #22	
	1.50 - 5.00 m. TUFF. Grayish. Hard.		Δ Δ Δ Δ Δ								UCT #20 (4.70 m.)	
	5.00 - 7.45 m. CLAYSTONE. Brown. Hard.	5	Δ									
	7.45 - 7.80 m. SANDSTONE.		•••••									UCT #21 (8.15 m.)
	7.80 - 11.00 m. CLAYSTONE. Greenish to Gray Hard.		•••••									
	11.00 - 11.70 m. SANDSTONE		•••••									
	11.70 - 30.00 m. TUFF. Grayish. Black. Hard.		Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ									UCT #22 (14.50 m.)  UCT #23 (17.00 m.)
		15										
		20										

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH meters	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
	TUFF. Grayish Black. Hard.	25	Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ							
NQ	BOTTOM OF HOLE: 30.00 m.	30	Δ Δ							
		35								
		40								



CONSTRUCTION & DRILLING SPECIALISTS, INC.

BOREHOLE LOG

Project NIA IRRIGATION CENTER Hole No. BH-6 Depth 32.00 m.  
 Location NIA COMPOUND, EDSA, Q.C. Date Started September 28, 1987  
 Client \_\_\_\_\_ Date Completed September 28, 1987  
 Ground Elevation \_\_\_\_\_ Depth to Ground Water 6.30 m.

DEPTH (meters)	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
				10	20	30	40	
0.00 - 1.50 m.	Concrete flooring and gravel filling							
1.50 - 3.00 m.	WASH BORING							SPT #23
3.00 - 5.00 m.	TUFF. Gray. Hard.							SPT #24
5.00 - 8.00 m.	CLAYSTONE. Buff to Gray. Hard.							UCT #24 (6.00 m.)
8.00 - 11.00 m.	Coring but no sample was recovered. Collected drill cuttings.							
11.00 - 11.30 m.	SANDSTONE.							SPT #25
11.30 - 26.80 m.	TUFF. Grayish to Black. Hard. Highly pervious.							UCT #25 (14.20 m.)
								UCT #26 (20.50 m.)

HOLE SIZE	GEOLOGIC DESCRIPTION OF MATERIALS	DEPTH meters	ROCK SYMBOL	WATER LEVEL	DRILLING REPORT	STANDARD PENETRATION TEST				REMARKS
						10	20	30	40	
NQ	TUFF		Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ							
	26.80 - 32.00 m.  SAND, Black. Stiff to Dense.		Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ							SPT #26 SPT #27 SPT #28 SPT #29 SPT #30 SPT #31
	BOTTOM OF HOLE: 32.00 m.									



