

THE REPUBLIC OF THE PHILIPPINES
NATIONAL IRRIGATION ADMINISTRATION

FEASIBILITY STUDY REPORT
ON
THE IMPROVEMENT PROJECT
OF
THE OPERATION AND MAINTENANCE
OF
NATIONAL IRRIGATION SYSTEMS
(AMRIS)

(APPENDIX B & C)

VOLUME III

FEBRUARY 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

JICA LIBRARY



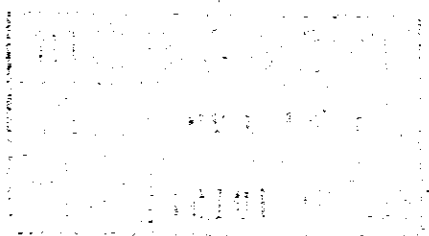
103056016J

THE REPUBLIC OF THE PHILIPPINES
NATIONAL IRRIGATION ADMINISTRATION

FEASIBILITY STUDY REPORT
ON
THE IMPROVEMENT PROJECT
OF
THE OPERATION AND MAINTENANCE
OF
NATIONAL IRRIGATION SYSTEMS
(AMRIS)

(APPENDIX B & C)

VOLUME III



FEBRUARY 1984

JAPAN INTERNATIONAL COOPERATION AGENCY

A F T
CR(5)
84-10

国際協力事業団	
受入 月日 '84. 3. 29	118
登録No. 10151	833
	AFT

CONTENTS

APPENDIX-B

	<u>Page</u>
CONTENTS.....	i
LIST OF TABLES.....	vii
LIST OF FIGURES.....	ix
REFERENCE MATERIALS-1.....	B.5-88
REFERENCE MATERIALS-2.....	B.5-103
CHAPTER I. PRESENT OPERATION AND MAINTENANCE WORK OF NATIONAL IRRIGATION SYSTEMS.....	B.1- 1
1.1. Present Organization of NIA.....	B.1- 1
1.1.1. General.....	B.1- 1
1.1.2. Organizational Structures and Functions of the Central Office.....	B.1- 1
1.1.3. Organizational Structural and Functions of the Regional Irrigation Offices.....	B.1- 3
1.1.4. Organizational Structure and Function of the National Irrigation Systems Offices.....	B.1- 5
1.2. Systems Operation and Maintenance Situation.....	B.1- 9
1.2.1. General.....	B.1- 9
1.2.2. Systems Operation.....	B.1- 9
1.2.3. Maintenance.....	B.1-12

1.3. Status of Irrigation Fees Collection..... B.1-14
1.3.1. Irrigation Fees Rates..... B.1-14
1.3.2. Exceptions and Penalties of the
Irrigation Fees..... B.1-15
1.3.3. Incentive Bonus Plan..... B.1-16
1.3.4. Billing Procedure..... B.1-17
1.4. Budget Allocation of O & M Works for
National Irrigation Systems..... B.1-18
1.5. Management Report..... B.1-21

**CHAPTER II. PRESENT OPERATION AND MAINTENANCE WORKS OF THE
AMRIS OFFICE..... B.2- 1**

2.1. General..... B.2- 1
2.2. Present O & M Organization and Staffing
of AMRIS..... B.2- 1
2.2.1. General..... B.2- 1
2.2.2. Organization and Staffing of AMRIS
Office..... B.2- 2
2.2.3. Staffing..... B.2- 3
2.3. Duties and Activities of AMRIS Office..... B.2- 9
2.3.1. General..... B.2- 9
2.3.2. Duties and Responsibilities..... B.2- 9
2.3.3. Function of Operation and Maintenance
Works..... B.2-13
2.4. Collection Status of Irrigation Fees..... B.2-20
2.4.1. Definition of the Irrigation Fees..... B.2-20
2.4.2. Status of Irrigation Fee Collection..... B.2-21
2.4.3. Major Reasons of Unpayment on
Irrigation Fee Payment..... B.2-22

	<u>Page</u>
2.5. Revenue and Expenditure of AMRIS.....	B.2-27
2.6. O & M Facilities and Equipments.....	B.2-29
2.6.1. Building Facilities.....	B.2-29
2.6.2. Heavy Equipments and Vehicles.....	B.2-29
CHAPTER III. STATUS OF ESTABLISHMENT OF IRRIGATORS'	
ASSOCIATION.....	B.3- 1
3.1. General.....	B.3- 1
3.2. Activities of Compact Farm Association	
in AMRIS Area.....	B.3- 1
3.2.1. Formation of Compact Farm Association.....	B.3- 1
3.2.2. Activities and Functions.....	B.3- 2
3.3. Pilot Irrigators' Association Project in AMRIS... B.3- 9	
3.3.1. General.....	B.3- 9
3.3.2. Status of the Area before the	
Association Set-up.....	B.3- 9
3.3.3. Outline of Agreement between NIA and	
the Association.....	B.3-10
3.3.4. Evaluation of Development after	
the Association Set-up.....	B.3-11
3.3.5. Financial Status of the Association	
(as of the end of 1982).....	B.3-12
3.3.6. Collection of Irrigation Service Fee.....	B.3-13
3.4. Activities of Communal Irrigation Systems.....	B.3-14
3.4.1. General.....	B.3-14
3.4.2. Request of the Project Formulation.....	B.3-14
3.4.3. Implementation of Construction Works.....	B.3-15
3.4.4. Conclusion of Agreement between NIA	
and the Association.....	B.3-15
3.4.5. Project Features.....	B.3-15
3.4.6. Activities of the Association.....	B.3-16

	<u>Page</u>
3.5. Irrigation Community Organization Programs (ICOP).....	B.3-17
3.5.1. Manning Schedule and Development Strategy.....	B.3-17
3.5.2. Accomplishments and Training Programs & Workshop.....	B.3-19
3.6. Farmer Irrigation Organizer Project (FIOP).....	B.3-23
3.6.1. General.....	B.3-23
3.6.2. Project Rational.....	B.3-23
3.6.3. Project Area of the Samples.....	B.3-24
3.6.4. Project Objectives.....	B.3-24
3.6.5. Project System and Components.....	B.3-25
 CHAPTER IV. RULES AND REGULATIONS COVERING THE O & M OF NATIONAL IRRIGATION SYSTEMS.....	 B.4- 1
4.1. Presidential Decree Related.....	B.4- 1
4.1.1. Agency to Operate and Maintain.....	B.4- 1
4.1.2. Organization.....	B.4- 1
4.1.3. Transfer and Discipline of Personnel.....	B.4- 2
4.1.4. Water Delivery.....	B.4- 3
4.1.5. Zoning of Irrigable Area for Dry Season Service.....	B.4- 4
4.1.6. Construction of Farm Ditches.....	B.4- 5
4.1.7. Maintenance of Farm Ditches.....	B.4- 5
4.1.8. Irrigation Fees.....	B.4- 6
4.1.9. Payment of Irrigation Fees.....	B.4- 8
4.2. Memoranda Circular.....	B.4-10
4.2.1. Guidelines on the Proper Maintenance of Irrigation Canals (IC #70, S.1972).....	B.4-10

4.2.2. Instructions to Preserve Irrigation Facilities.....	B.4-14
4.2.3. Principal Duties of O & M Personnel and Actions Taken in the Deficiency of Personnel (April 11, 1977).....	B.4-16
4.2.4. Revised Incentive Bonus Plan for Irrigation Service Fee Collection (MC #101, S.1980).....	B.4-17

CHAPTER V. STRENGTHENING OF OPERATION AND MAINTENANCE

STRUCTURES.....	B.5- 1
5.1. Strategy of Upgrading Operation and Maintenance Structures.....	B.5- 1
5.2. Organization Structures and Staffing of AMRIS...	B.5- 7
5.2.1. General.....	B.5- 7
5.2.2. Proposed Organization and Staffing of Project Implementation.....	B.5- 8
5.2.3. Proposed Organization for Post-Project...	B-5-15
5.3. Organization and Staffing of the Irrigators' Association.....	B.5-30
5.3.1. Organization of the IAs and the FIAs.....	B.5-30
5.3.2. Staffing Plan of the IAs and the FIAs.....	B.5-30
5.4. Methodology of Irrigators' Associations Establishment.....	B.5-40
5.4.1. General.....	B.5-40
5.4.2. Executing Body for Establishment of Irrigators' Association and Mobilization Plan.....	B.5-44

5.4.3. Size and Service Components of Irrigators' Association.....	B.5-62
5.4.4. Methodology and Procedures for Establishment of Irrigators' Association.	B.5-66
5.4.5. Organization and Responsibility of the Association.....	B.5-82
5.4.6. Financial Assistance for Establishment of IA.....	B.5-86
5.4.7. Articles and Agreement Memorandum.....	B.5-86
5.5. Collection of Irrigation Fee.....	B.5-107
5.5.1. Payment Availability of the Beneficiary Farmers on the Irrigation Fee.....	B.5-107
5.5.2. Prospect of Collectible Irrigation Fees..	B.5-108
5.5.3. Collection Procedures of Irrigation Fee..	B.5-109
5.6. Strengthening Operation and Maintenance Facilities and Equipment.....	B.5-112
5.6.1. Building.....	B.5-112
5.6.2. Computerization of the Work.....	B.5-112
5.6.3. Proposed Operation and Maintenance Equipment.....	B.5-113
5.7. Operation and Maintenance Cost.....	B.5-118

LIST OF TABLES

APPENDIX-B

	<u>Page</u>
Table B.1.4- 1. Budget Allocation of O & M Works for National Irrigation Systems by Region(1983).....	B.1-19
B.1.4- 2. Breakdown of Other Expenses.....	B.1-20
B.1.5- 1. Report Preparation at Respective Level.....	B.1-23
B.2.2- 1. Number of Existing Staff.....	B.2- 4
B.2.3- 1. O & M Practice by W.M.T. at Working Station...	B.2-19
B.2.4- 1. Collection Status of Irrigation Fee(CY 1982)..	B.2-24
B.2.5- 1. Revenue and Expenditure of Operation and Maintenance in AMRIS.....	B.2-28
B.2.6- 1. Operable and Non-Operable Equipment of AMRIS..	B.2-30
B.2.6- 2. Operation Records of Equipment.....	B.2-31
B.3.2- 1. Function of Compact Farm.....	B.3- 5
B.3.2- 2. Existing Service Area, Number of Compact Farm And Number of Farmers.....	B.3- 6
B.5.2- 1. Number of Staff in Amris.....	B.5-18
B.5.2- 2. Number of Staff During and Post Project (Before Partial Turnover).....	B.5-20
B.5.2- 3. Proposed Number of Staff for Phase-1 & Phase-2.....	B.5-21
B.5.2- 4. Joint Operation and Maintenance Schedule of Phase-1.....	B.5-22
B.5.2- 5. Joint Operation and Maintenance Schedule of Phase-2.....	B.5-24
B.5.3- 1. Size of Operation and Maintenance by IA.....	B.5-31
B.5.3- 2. Size of Operation and Maintenance by IA or FIA.....	B.5-33
B.5.3- 3. Staffing Plan for IA(Phase-1).....	B.5-35
B.5.3- 4. Staffing Plan for FIA(Phase-2).....	B.5-36
B.5.4- 1. Cost Required of IAS Establishment for Phase-1	B.5-53

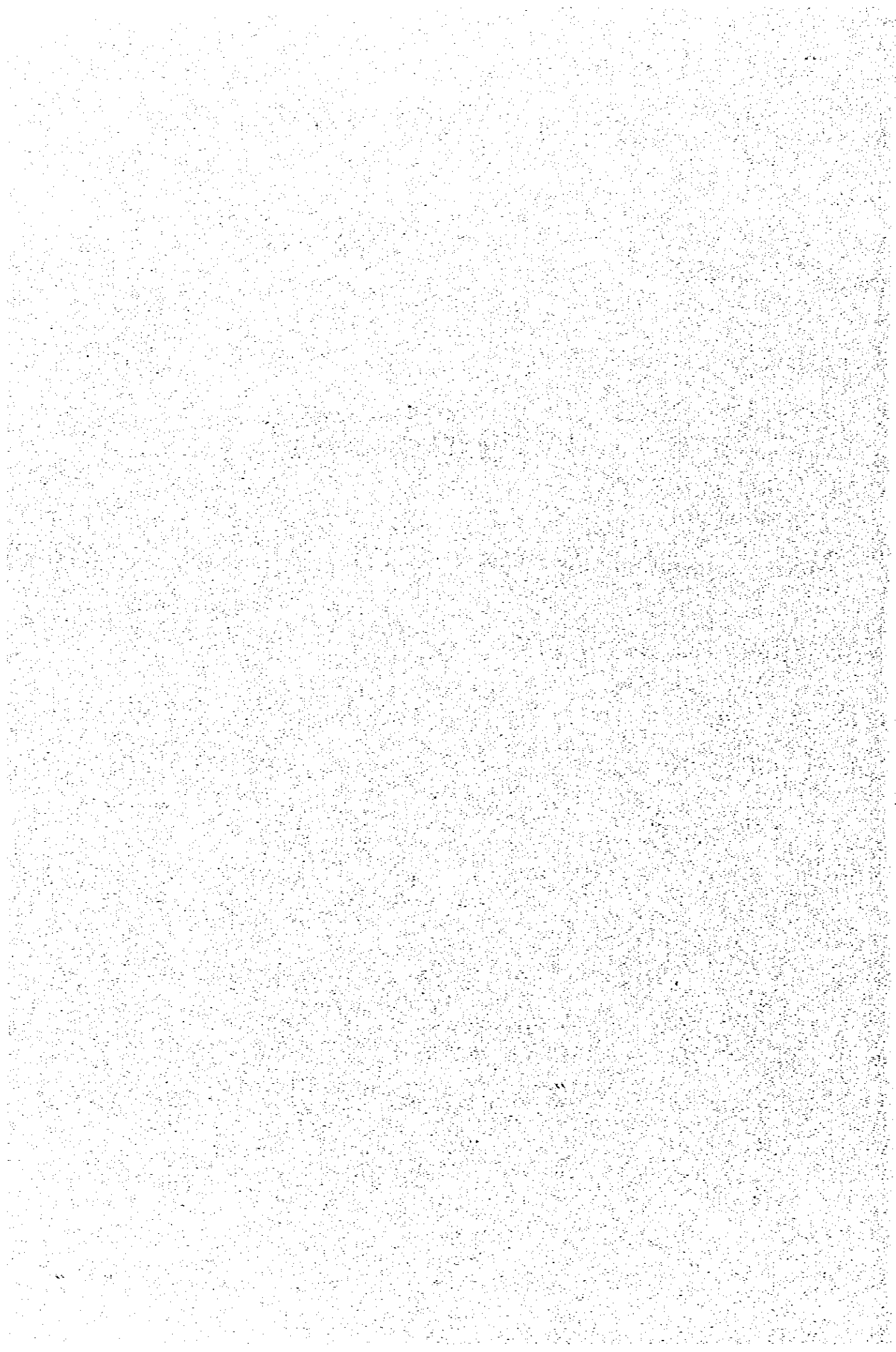
B.5.4- 2. Cost Required of FIAs Establishment for Phase-2.....	B.5-54
B.5.4- 3. Budgetary Requirement of IAS Establishment for Phase-1.....	B.5-55
B.5.4- 4. Budgetary Requirement of FIAs Establishment for Phase-2.....	B.5-59
B.5.6- 1. Proposed Equipment for O & M.....	B.5-115
B.5.6- 2. Proposed Operational Distance/Hour.....	B.5-116
B.5.6- 3. Major Purpose and Facility Classification of Equipment.....	B.5-117
B.5.7- 1. Summary of Operation and Maintenance Cost.....	B.5-120
B.5.7- 2. Personal Service for NIA Office (Before Turnover).....	B.5-121
B.5.7- 3. Personal Service for NIA Office (After Turnover).....	B.5-122
B.5.7- 4. Personal Service for IA(After Turnover).....	B.5-123

LIST OF FIGURES

APPENDIX-B

	<u>Page</u>
Figure B.1.1- 1. Existing Overall NIA Organization.....	B.1- 7
B.1.1- 2. Typical Organization of Regional Irrigation Office.....	B.1- 8
B.2.2- 1. Existing Organization Chart of Regional Irrigation Office III.....	B.2- 7
B.2.2- 2. Existing Organization Chart of AMRIS.....	B.2- 8
B.2.4- 1. Crop Intensity and Collected Ratio of Irrigation Fees by Working Station and Division(1981).....	B.2-25
B.2.4- 2. Crop Intensity and Collected Ratio of Irrigation Fees by Working Station and Division(1982).....	B.2-26
B.5.2- 1. Proposed Organization of Project Implementation.....	B.5-26
B.5.2- 2. Proposed Organization of AMRIS Office.....	B.5-27
B.5.2- 3. Operation and Maintenance Works by NIA and IAs.....	B.5-28
B.5.2- 4. Joint Operation and Maintenance Program.....	B.5-29
B.5.3- 1. Organization Chart of Irrigators' Association	B.5-38
B.5.3- 2. Organization Chart of PIA.....	B.5-39
B.5.4- 1. Major Activities on the Establishment of Irrigators' Associations.....	B.5-45
B.5.4- 2. Establishment Schedule of IA.....	B.5-61
B.5.4- 3. Management System in Irrigators' Association.	B.5-64

**CHAPTER I. PRESENT OPERATION AND MAINTENANCE WORK
OF NATIONAL IRRIGATION SYSTEMS**



**CHAPTER I PRESENT OPERATION AND MAINTENANCE WORK
OF NATIONAL IRRIGATION SYSTEMS**

1.1 Present Organization of NIA

1.1.1 General

The present organization structure of NIA consists of three major organizational categories, such as Central office, Regional Offices and System Offices. All of them are involved in operation and maintenance activities. This paragraph presents an outline of NIA's existing organization and responsibilities especially from the operation and maintenance aspect.

1.1.2 Organizational Structures and Functions of the Central Office

At the top of the Central Office organization is the Office of the Administrator which reports to the Board of Directors and controls all the business and affairs of the NIA. Assisting the Administrator in the Central Office are four major functional groups each headed by an Assistant Administrator, namely; Project Development and Implementation, Operations, Finance and Management, and Administrative and Personnel.

The overall functions of these groups are as follows:

- Project Development and Implementation:

It is responsible for planning, organizing, directing and controlling the operation and maintenance, rehabilitation, and equipment management activities of NIA.

- Operation:

It is responsible for planning, organizing, directing and controlling the operation and maintenance, rehabilitation, and improvement of the irrigation systems and related activities.

- Finance and Management:

It is responsible for planning, organizing, directing and controlling financial recording, analysis and reporting, budget, collection, fund management, internal audit, management and organization and related activities.

- Administrative and personnel

It is responsible for planning, organizing, directing and controlling human resource management, records management, legal assistance, general services, public information, procurement and property and related activities.

Figure B.1.1-1 is illustrated the existing overall structure of the NIA organization.

Below the Assistant Administrator for the Operations, there are two departments, one integrated systems, and several organizations implementing special projects or major rehabilitations of and improvements to national irrigation systems.

The systems Management Department (SMD) is one of the departments under the Assistant Administrator for Operations. The functions of SMD involve (1) formulation and development of plans to increase cropping intensities in the service areas, (2) evaluating operation and maintenance plans, rehabilitation programs, and budgets, (3) monitoring and assessing overall performance of national irrigation systems (4) conducting studies on various water management parameters to improve planning and implementations of water management, (5) making necessary recommendations to NIA management on operations, maintenance, and rehabilitation of these systems. The SMD has three functional divisions, namely; Operation and Maintenance Division, Repair and Improvement Division, and Research and Development Division.

The Irrigators Assistance Department (IAD) is another staff department which reports directly to the Assistant Administrator for Operations. The IAD's overall objectives are to coordinate technical assistance granted to the farmers as well as the organization of farmers to prepare them for the eventual takeover of certain aspects of the operation and maintenance of irrigation systems.

The IAD was set up to extend assistance to farmers associations by conducting research and training programs to teach the farmers improved farm water management and related agricultural practices. In addition IAD is responsible for coordinating agricultural support services rendered by other government and private agencies performing activities related to agricultural development. IAD's functions focus on activities directed toward improving the external environmental factors affecting the O & M of the irrigation systems. The IAD' organization structure consists of the Farmers Organization and the Training Division, and the Irrigators Assistance Division.

1.1.3 Organizational Structures and Functions of the Regional Irrigation Offices

The Regional Irrigation Office (RIO) serves as an intermediate office between the System Offices and Central Office. It generally directs, supervises, and coordinates irrigation activities in the region such as the operation and maintenance of the national irrigation systems, design and construction of communal irrigation systems and their related activities. The RIO also provides technical, administrative, accounting and other services to the system offices within the region. Exceptions to this, however, are some systems offices particularly national irrigation system undergoing major rehabilitation and improvement and special projects with foreign assistance which are not under the regional irrigation office.

The Regional Irrigation Office is composed of seven major office or divisions which have the following functions:

- Office of the Regional Irrigation Director (RIO) is responsible for directing and coordinating all irrigation related activities of the region.
- Engineering Division is responsible for identifying potential irrigation projects, determining economic and technical feasibility of these projects, designing irrigation structures, and supervising and monitoring the construction of irrigation projects in the region.
- Operation division is responsible for monitoring and evaluating the operation and maintenance of national irrigation systems in the region.
- Agricultural Coordination Division is responsible for coordinating with the various government agencies and private offices involved in agricultural production, coordinating or participating in the organization of farmer's association, conducting research on irrigation water management and technology.
- Equipment Management Division is responsible for managing the proper utilization and maintenance of equipment and vehicles assigned to the Regional Irrigation Office and providing equipment and maintenance services to the system offices within the region.
- Administrative Division is responsible for providing administrative services to the regional irrigation office and its systems offices.
- Accounting Division is responsible for recording the financial transactions of the regional irrigation office and its systems offices in the official books of accounts and preparing periodic financial reports to the Central Office.

The existing organization structure for a typical regional irrigation office is illustrated in Figure B.1.1-2.

1.1.4 Organization Structure and Function of the National Irrigation Systems Offices

In general, organization and capacity of the respective national irrigation system office depends on the features of the irrigation system and service areas. The organization of the small and medium systems consists of three major groups, namely; Office of the Irrigation Superintendent, Operation and Maintenance Section, and Administrative Section.

The Irrigations Superintendent has overall responsibility for planning, directing and coordinating the activities of the system. The Operation and Maintenance Section distributes irrigation water to turnouts, maintains canals, control structures and measuring devices and collects the irrigation fees. The Administrative Section provides administrative services such as personnel, accounting, cashiering, billing and collection, property and procurement and other services.

The existing organization and functions of the large scale system is composed of six major groups, which are, the Office of the Irrigation Superintendent, Administrative Section, Agriculture Section, Operation Section, Repair and Improvement Section, and Collection Services Section. The function of the respective sections are very similar to those of the small systems.

A brief description of these functions is given below.

- The Office of the Irrigation Superintendent responsible for directing and coordinating the various activities of the system.

- Operation Section is responsible for distributing irrigation water to turnouts, maintaining canals, control structures, measuring devices and related facilities in good condition and collecting irrigation fees from farmers. Under the Operation Section are the operating zones headed by the zone engineers who perform the above functions on a smaller scale and the WCCC which handles overall planning and monitoring of water distribution. In addition, the WCCC performs minor engineering functions such as design and technical supervision of the construction of minor structures.
- Repair and Improvement Section is responsible for the operation, maintenance and repair of vehicles and equipment.
- Administrative Section is responsible for providing office and administrative services such as personnel, accounting, cashiering, communications, right of way processing, security, janitorial and other services.
- Bill and Collection Section is responsible for billing and collecting irrigation fees from water users. The Operation Section assists this section in collecting irrigation fees.
- Agricultural Section is responsible for organizing farmers into irrigation associations. This section exists when there are definite plans to turn over the operation and maintenance of whole or part of the system to the farmers organization. The typical organization of a large scale system is illustrated in Figure B.2.2-2.

FIGURE B.1.1-1 EXISTING OVERALL NIA ORGANIZATION

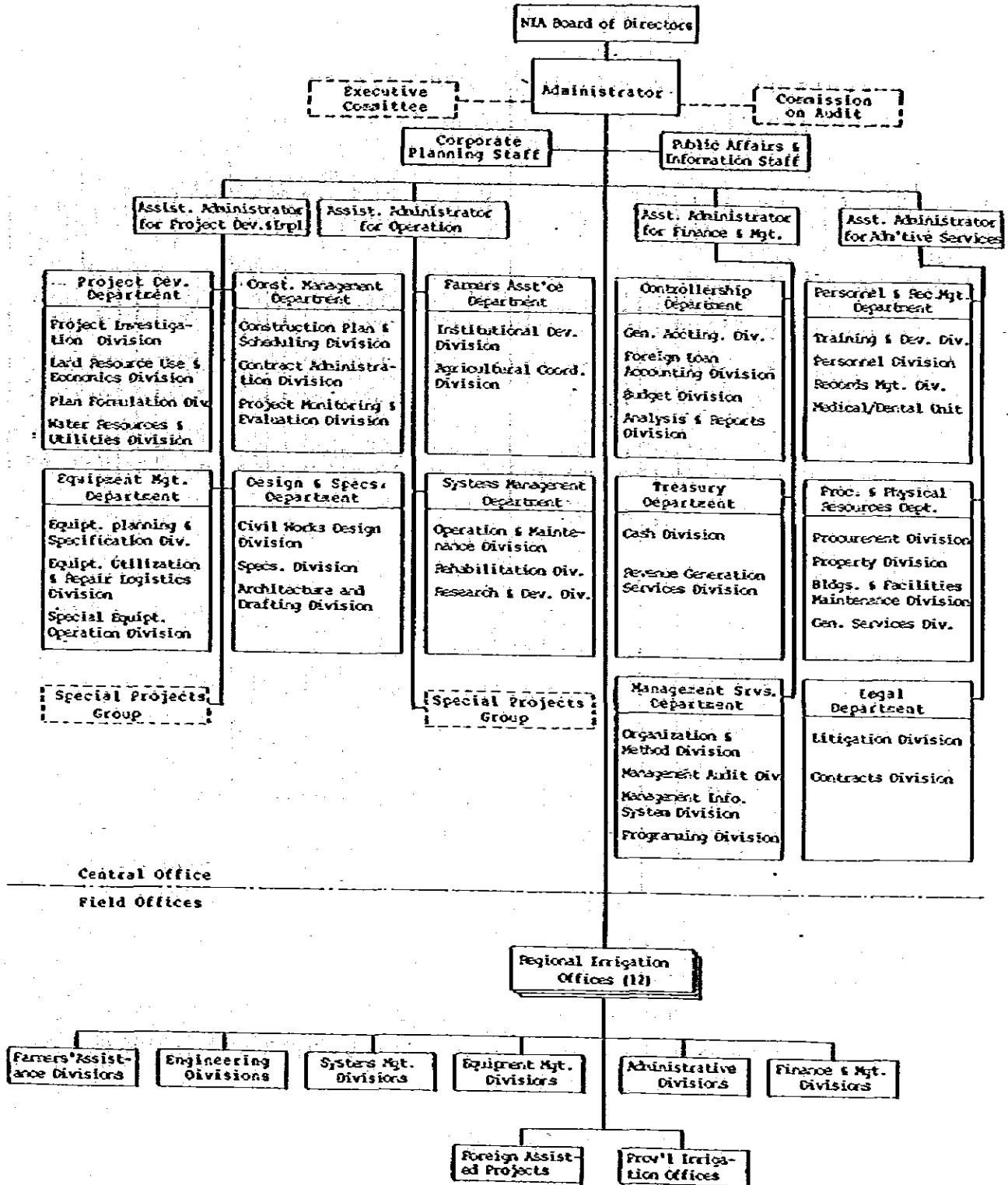
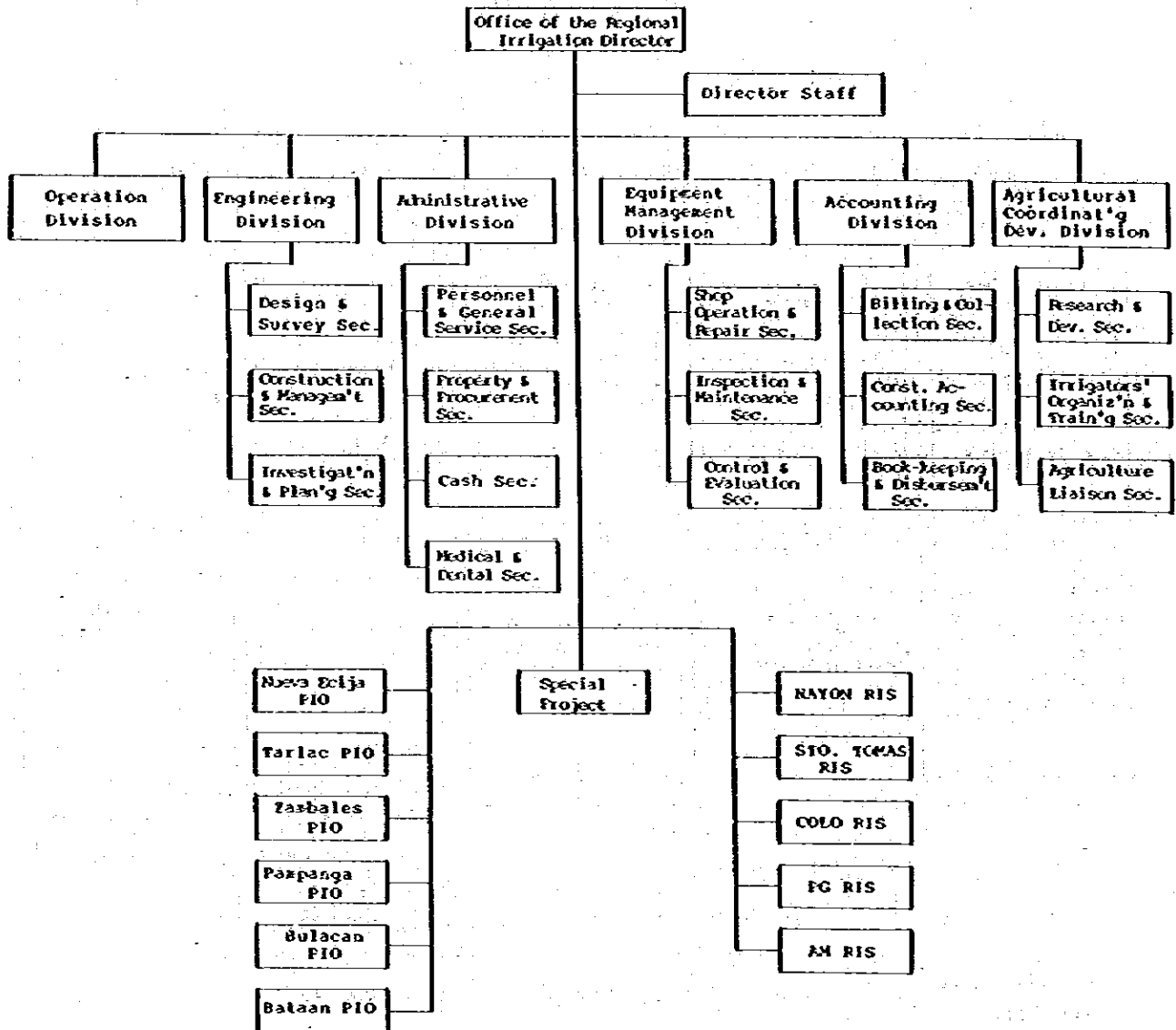


FIGURE B.1.1-2 TYPICAL ORGANIZATION OF REGIONAL IRRIGATION OFFICE



1.2 Systems Operation and Maintenance Situation

1.2.1 General

The basic concept of the operation and maintenance of irrigation systems is equitable delivery of irrigation water to each farm at the proper time. The laws and regulations of the O & M works of national irrigation systems have been stipulated by presidential decrees, NEDA resolutions and NIA Memorandum circulars.

The rules and regulations governing the operation and maintenance of NIA National Irrigation Systems states that only NIA personnel are to operate and maintain main, lateral, sub-lateral canals and appurtenant structures and gates. The operation of on-farm facilities within their service areas has been taken over by the farmers. This sub-chapter discusses the outline of the operation and maintenance of the national irrigation systems.

1.2.2 Systems Operation

Good water management is the proper practice of high quality operation throughout the year. In general, there is no remarkable water shortage in the wet season and the canals are operating well below capacity, there is no strong incentive or requirement to exercise good water management practices and efficient system operation in order to meet crop needs. On the other hand, during the dry season when shortages exist in water supply and canal capacity, good water management is deficient to meet distribution requirements, even the best practices may not produce equal distribution between upper and lower farmers on the canals. Therefore, operating personnel shall be given more detailed instructions on their daily activities.

Farmers were observed manipulating gates, checking laterals with banana log or bamboo, and making their own diversions, often through unauthorized turnouts. The reasons for this is (1) to serve high areas within their service area that cannot be otherwise served, (2) right of way problems or maintenance problems between joint users of a common farm ditch, (3) to eliminate the need for keeping farm ditches clean and in good working order, (4) to permit taking a full supply of water in a short period of time where lateral delivery is sporadic or where rotation between laterals is practiced. Those unauthorized turnouts generally have no gates and opening and closing is generally operated with grass plugs and resulting lack of water control and or over distribution. The pipe of turnouts is often placed high on the canals bank where it can be served only with severe overchecking of the canal in order to supply water to high land. Furthermore, turnout on the systems are generally inadequate because they are not kept in repair, or they have no operable gate, or they have no measuring capability.

Installation of accurate measuring devices is an indispensable element in good water management. The majority of the national irrigation systems have not been adequately provided with accurate measuring devices at proper location. Data gathering, analysis and calibration method of staff gauges should be modified to the appropriate method from the point of view of physical conditions.

Some areas experience cropping and harvesting difficulties due to a combination of inadequate drainage canals and poor water management. Excessive irrigation diversion cause some submergence of crop land even in the dry season and such conditions are substantially worse in the wet season. Uncoordinated planting and harvesting schedules result in unwanted water in areas ready to be harvested.

Diversion dams and check structures on major streams have caused some overbank flooding due to the failure to remove flashboards or open gates during high runoff periods.

Pump irrigation systems suffer from high power costs and low pumping plant efficiencies. Present O & M costs are much higher than irrigation fees charges being made. Rising power costs will further aggravate the situation. NIA shall pursue negotiations with the National Power Corporation (NPC) and with the electric cooperatives which would result in significantly lower power rates for irrigation pumping during predetermined time periods.

The majority of the canals operated and maintained by NIA should have service roads along at least one bank. These provision of roads along the canals will benefit the systems in three ways, (1) by making it possible to operate the system and observe the flow of water efficiently, (2) by providing access for the maintenance crews, (3) by providing access for the farmer to his fields.

Annual system operation plans include the following elements at the system office level.

- Program area and crops
- Cropping pattern
- Water delivery schedules
- Probable effective rainfall
- Projected status of farming activities
- River flows
- Projected headgate diversion
- Reasons for excluded area from irrigable area
 - a) drainage deficiency
 - b) basic water supply
 - c) physical structures deficiency
- Target irrigation efficiency

1.2.3 Maintenance

The definition of maintenance is repair work routinely performed to prevent excessive deterioration of facilities, to maintain the system in good working order and the ability to efficiently distribute the project water supply. The term rehabilitation is defined as the major overhaul of a facility, that in spite of good routine maintenance over several years. The discussion is mainly on maintenance work of the systems in this paragraph.

The major constraints on maintenance are insufficient repair works to keep the system in good order due to an inadequate local budget allocation.

The present method of grass cutting of canal embankments by permanently assigned ditchtenders is not uniformly effective and is too costly. Because at a few major canals, grass is perhaps cut more often than would be necessary while at some lateral ends, grass is seldom cut. This insufficient vegetation control accelerates silt deposition and decreases the carrying capacity of the canals.

The normal silt contribution to canals is within expected limits but is of a magnitude to warrant periodic removal. Small laterals are most frequently effected by siltation, as a result of greater vegetative growth in these shallow canals. Contributions of larger sized sediments are found immediately below many canal headworks at major river diversions. Coarse materials are also brought into canals by heavy storm runoff from steep hillsides. Cleaning of canals should be carried out with the appropriate equipment and or by hand.

There is some localized erosion of canal sideslopes below the water surface elevation. As the bank erodes the side

slope steepens and the area of erosion accelerates. This results in loss of toe support to the upper portion of the bank including sloughing.

In all systems the maintenance of drainage and creeks is inadequate. Heavy growth of aquatic vegetation and siltation has significantly reduced canal capacity. Cleaning of vegetation from drainages is not being practiced as a maintenance activity.

Check dams and obstructions constructed in drainages and creeks impair drainage and create serious backwater problems and have resulted in severe overbank flooding during heavy runoff periods.

Major problems, found to exist at diversion dam structures, consist of abutment erosion and the loss of rip-rap, lack of maintenance and periodic exercise of operating machinery, lack of sluicing, need for motorization of gates and improvement of stop-log controls.

Major problems related to the canal structures are insufficient numbers of gates at some structures now controlled by stop-logs, scour and bank erosion immediately downstream and around structure outlet transitions, gate problems due to damage, missing parts and general lack of routine maintenance.

The condition of service roads along main canals and major laterals is generally good to excellent. Many laterals and sub-laterals bank roads, however, show no evidence of grading and are impassable. Overtopping of the lateral bank and road as a result of farmer overchecking is a frequent occurrence. This is most common on smaller laterals that have become constructed by silt or vegetation.

1.3 Status of Irrigation Fees Collection

1.3.1 Irrigation Fees Rates

According to the NEDA Resolution No.20 (Series of 1978), Irrigation Fees are to be established at levels that will:

- (1) Provide for total reimbursement of public investments on irrigation facilities within the maximum fifty years but excluding interest costs which the government will subsidize:
- (2) Provide for total coverage of working expenses incurred in the operation and maintenance of irrigation systems:
- (3) not be disincentives to farmers to avail themselves of the benefits of irrigation systems:
- (4) Be within the farmers capacity to pay.

The discussion of this chapter is mainly the actual working expenses of the operation and maintenance activities of the irrigation systems.

Irrigation fees are set in cavans of palay or its cash equivalent at the prevailing government support prices at the time of payment. Ordinarily, the fee rates depend on the type of system and the planting season. Current fee rates stated in cavans (50 kg) of palay are as follows:

(Unit: cavan per hectare)

<u>Ordinary Rates</u>	<u>Wet Crop</u>	<u>Dry Crop</u>	<u>Third Crop</u>	<u>Annual Crop</u>
Gravity systems	2	3	3	5
Pump systems	3	5	5	8

The use of the government support price for palay in determining the cash equivalent of the irrigation fee is appropriate. Since the irrigation fees are stated in cavans of palay, the amount of fee collectible from farmers is increased every time there is an increase in the government support price.

1.3.2 Exemptions and Penalties of the Irrigation Fees

The landowners are exempted from payment of irrigation fees whenever crops fail due to water shortages or irrigable land is not benefitted by irrigation. Current NIA's exemption of the fee payment is those whose yield is less than 40 cavans of palay per hectare. According to the results of analysis by NIA, the total amount of exempted fees in 1981 was about 3.8 percent of the collectible fees which amounts to about 124.3 million pesos.

On the other hand, NIA allows a ten percent discount to beneficiary farmers who pay their bills on or before the set deadlines. After these deadlines, NIA charges one percent simple interest per month to farmers who have not paid. The total accounted amount irrigation fees in the AMRIS area, for instance, is approximately 3.2 times that of the annual collectable fee. Though collection efficiency has increased since collections of irrigation fees in kind were authorized, actual collection efficiency is still behind the collectible amount.

There are many reason for collection difficulties.

- (1) Many systems find it difficult to maintain a complete and accurate list of landowners and their addresses due to changes in land right and the large number of landowners.
- (2) Some landowners do not pay because of their unsettled claims for payment of canal right of way.
- (3) Some share-tenants remit part or all of the total irrigation fee to the landowner in accordance with their agreement, but difficulty arises in collecting from the landowners. On the other hand, some landowners claim their tenants have not turned over the irrigation fees to them.
- (4) Low yields normally result in lower income for the farmers. With income barely above subsistence level,

farmers may not have adequate means of paying the irrigations fees, considering all their necessary domestic expenses.

- (5) A number of systems report insufficient funds for transportation expenses of bill collectors as well as a lack of motorcycles. Under a recent NIA policy, however, motorcycle allowances are provided to Irrigation Technicians and Watermasters for the effective performance of O & M functions as well as for speedy collection of irrigation fees.
- (6) When farmers expect the price of palay to increase they withhold payment because an increase in fee rates lags behind the increase in palay price by about one full cropping season. They can then sell their palay at the new higher price and pay their irrigation fees computed at the old prices.
- (7) Farmers who do not pay their bills are not penalized. This is because water delivery to farmers cannot be stopped without cutting off the service to paying farmers on the same turnout.

1.3.3 Incentive Bonus Plan

NIA has an incentive bonus plan for collectors of irrigation fees. Under the plan, the irrigation systems organization is entitled to a bonus if at least a 70 percent collection efficiency rate is attained on current and back accounts. The bonuses are divided into two categories, such as 85 percent to the collection team and team leader and 15 percent to O & M personnel with satisfactory performance. According to some analysis, high collection efficiency does not necessarily mean there will be a benefit to NIA if a corresponding high collection cost is incurred. In either case, the incentive bonus plan does not serve to motivate the systems personnel to increase NIA's revenues or decrease NIA's expenses.

1.3.4 Billing Procedure

The present billing procedures are adequately prepared based on "Billing and Collection Manual on Irrigation Service Fee". The summary of the billing procedures are as follows:

- (1) Field officer (Watermaster or Water management Technician) prepares and submits weekly a List of Irrigated and Planted Area (L.I.P.A) to the Irrigation Superintendent for review and assignment to the Billing Clerk.
- (2) The Billing Clerk prepares bills in two copies on the basis of the LIPA. He enters the bill in the Irrigation Fee Register and prepares a Statement of account covering back accounts and penalties.
- (3) The Irrigation Superintendent approves the bill and statement of account.
- (4) W.M or WMT distribute bills and statements of account to the farmers.
- (5) Billing clerk batches the duplicate copies of the bill by 50 sheet and prepares the Summary of Fifty Bill (SPB) for every batch.

The bill distribution in many systems is not timely, often extending beyond the harvest time, and this hampers collection efficiency. Late distribution of bills is caused by lack of manpower, office equipment and stationary, and incomplete records or data.

1.4 Budget Allocation of O & M Works for National Irrigation Systems

Annual budget allocations for operation and maintenance work for 100 national irrigation systems in calendar year 1983 are presented in Table B.1.4-1 and B.1.4-2.

As can be seen on the tables, the amount required for personnel services accounts for around 87 percent of the total budget of O & M works. It is a fact that these service expenses press smooth execution of operation and maintenance works. On the other hand, other expenses share only 13 percent of the annual budget including material supply of two percent, and especially maintenance costs for the systems are negligible small. As a result, majority of national irrigation systems have several different constraints and do not enjoy without much farmers confidence due to insufficient water supply and inadequate systems maintenance provision.

NIA should make every effort to upgrade the collection efficiency of the irrigation fees to meet just annual expenditures of O & M works. The target collection efficiencies for the whole systems, therefore, will be upgraded to about 75 percent from 59 percent.

TABLE B.1.1.4-1 BUDGET ALLOCATION OF O & M WORKS FOR NATIONAL IRRIGATION SYSTEMS BY REGION (1983)

Re- gion	No. of Project Area	Service Area (ha)	Personnel		Other Expenses		Total (1) Amount	Collection Goal (2)	Ratio (1) (2) x 100	(Unit: P 1,000) Collection Efficiency		O & M Cost P/ha
			Amount	%	Amount	%				1980	1981	
1	19	55,067	9,545	89	1,197	11	10,742	100	132	52	52	195
2	13	83,868	9,997	83	2,032	17	12,029	100	42	44	61	143
3	10	168,724	33,804	84	6,331	16	40,135	100	73	51	51	238
4	12	41,584	7,788	93	594	7	8,382	100	86	66	65	202
5	8	17,314	4,136	80	1,014	20	5,150	100	94	43	40	297
6	9	49,719	8,317	95	457	5	8,774	100	24	43	63	176
7	1	310	99	89	12	11	111	100	247	203	203	352
8	7	14,636	3,479	94	207	6	3,686	100	91	88	50	252
9	4	10,769	1,812	94	112	6	1,924	100	60	68	68	179
10	2	750	178	89	23	11	201	100	28	92	56	261
11	9	25,911	4,397	92	387	8	4,784	100	94	66	77	285
12	6	23,455	3,778	93	304	7	4,082	100	65	82	99	174
Total	100	492,107	87,330	87	12,670	13	100,000	100	73	53	59	203

B.1.1.19

Notes:

1. Budget for UPRIS support Divisions (OM Staff, Agriculture, Equipment and Dam Devisions) are not included in this Budget.
2. Personnel services include salaries, wages, GSIS, PAG-IBIG Fund, COLA, Amelioration Allowance, Incentive Allowances, estate insurance, medicare and term insurance.
3. Other O & M expenses include traveling expenses, supplies and materials, collection expenses, water, illumination and power services, gas and oil for vehicles, power for pumps, communication services, rents, transportation and representation allowances motorcycle allowances, uniform allowances for guards and lady employees, building insurance and registration and insurance of vehicles.

* Source provided by SMD, NIA.

TABLE B.1.4-2 BREAKDOWN OF OTHER EXPENSES

Items	Amount	Proportion
1. Travelling expenses	P 371,860	2.9 ⁸
2. Supplies, materials	1,980,940	15.6
3. Collection expenses	1,168,800	9.2
4. Motorcycle allowance	197,380	1.6
5. Gasoline oil for vehicles	4,047,900	32.0
6. Power for pumps	2,478,000	19.6
7. Collection bonus	335,300	2.6
8. Contractual services	293,460	2.3
9. Other services & expenses*	1,796,360	14.2
<u>Total</u>	<u>12,670,000</u>	<u>100.0</u>

* Other services & expenses include communication services, representation & transportation allowances, uniform allowances, water illumination & power services, furniture and equipment, registration and insurance of NIA vehicles, insurance of NIA building.

1.5 Management Report

The management reporting systems being applied to the National Irrigation System are as shown in Table B.1.5-1. The reports consist of systems operation and maintenance, equipment and maintenance, billing, collection and accounting, property and personnel aspects.

The major items to be reported in respective fields can be summarized as follows:

(1) Operation and maintenance reports

The reports at system level shall consist of irrigated and benefitted area, budget proposals, harvest production, O & M plan, cropping calendar and water delivery schedule, water requirement, O & M plan, cropping calendar and water delivery schedule, water requirement, O & M monitoring curve, list of lots with total crop failure due to water shortage/flood etc.

The reports at regional level shall include O & M monthly report, O & M monitoring curve, irrigated and benefitted area, budget proposals, O & M plan, harvest and production, list of lots with total crop failure due to water shortage and flood, monthly report of inspection of the regional irrigation director of staff.

(2) Equipment and maintenance reports

The report at system level shall include supplies consumption report, preventive maintenance and inspection schedule, quarterly and monthly rehabilitation and repair progress, evaluation of fuel consumption, monthly O & M and repair cost, monthly equipment/vehicle utilization and status.

The reports at regional level are almost the same as at system level.

(3) Billing, collection and accounting

The reports at system level are statement of income and expenses, report of remittances, collection fees status, collection evaluation and efficiency etc.

The reports at regional level shall consist of trial balance, billing and collection, collection efficiency, status of accounts receivable and payable, statement of account balances, comparative statement of income and expenses, weekly collection reports, national collection and remittances, disbursement, cost report, abstract of summary of every 50 bills prepared, etc.

(4) Property and personnel reports

The reports at system level shall include inventory of all NIA property, annual report of personnel with educational qualifications, waste materials and supplies consumption, performance appraisal, accountability, procurement of goods and services, confirmation of properties and materials received from C.O., monthly inventory of NIA pálay stock, manpower utilization, etc.

The reports at regional level are almost the same as those at system level.

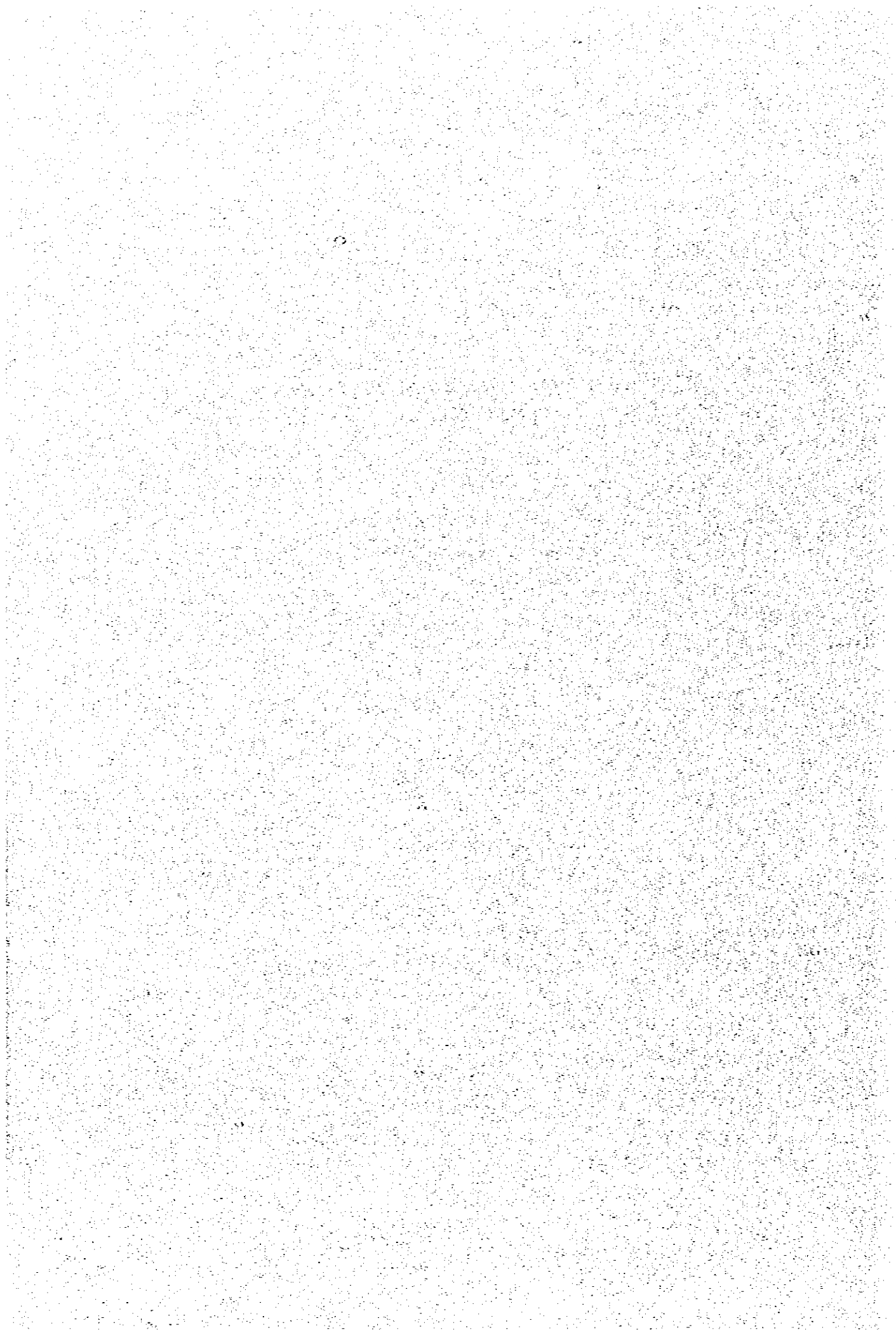
There are large volumes of transactions in preparing reports in each irrigation systems, bottlenecks and delays in report preparation are often encountered. One of the ways of solving these problems would be computerization and simplifications of the works concerned. Computerization would be helpful to

- 1) facilitate the land and water records used as a basis for water delivery and billing,
- 2) improve the capability of the irrigation systems to prepare bills before harvest time,
- 3) record collections and keep track of delinquent accounts,
- 4) provide management with timely reports,
- 5) assist management to control costs and expenses and,
- 6) assist management to monitor the performance of the systems.

TABLE B.1.5-1 REPORT PREPARATION AT RESPECTIVE LEVEL

Management Field	Central Office		Regional Office		Annual R.		Semi-Annual R.		System office			
	8	7	4	4	1	2	3	4	Quarterly	Monthly	Weekly	Total
1. Operation and Maintenance	8	7	4	4	1	2	3	4	1	2	6	17
2. Equipment and Maintenance	9	14	0	2	3	11	1	2	3	11	1	17
3. Bill, Collection, Account	22	39	1	2	2	14	2	2	2	14	5	24
4. Property and Personnel	9	12	4	7	0	7	7	7	0	7	1	19
<u>Total</u>	<u>48</u>	<u>72</u>	<u>9</u>	<u>15</u>	<u>6</u>	<u>34</u>	<u>13</u>	<u>77</u>				

**CHAPTER II. PRESENT OPERATION AND MAINTENANCE WORKS
OF THE PARIS OFFICE**



CHAPTER II PRESENT OPERATION AND MAINTENANCE WORKS OF THE AMRIS OFFICE

2.1 General

The purpose of this aspect study is to improve NIA's operation and maintenance structures which have been facing several constraints. Major goals of this study are reduction of NIA annual expenditure on operation and maintenance work, more satisfactory collection of the irrigation fee, establishment of capable irrigator's associations and provision of appropriate training and orientation to the farmers concerned, and transference of partial operation and maintenance work to the irrigator's association.

In order to solve the constraints and to approach these aims, the following survey, investigations, collections of data and information, and review were conducted.

2.2 Present O & M Organization and Staffing of AMRIS

2.2.1 General

The AMRIS main office assumes general control of twelve (12) working stations which are responsible for the execution and supervision of O & M works for 31,485 hectares in the project area. The main office and working stations are directly in charge of the operation and maintenance of such facilities as diversion dams, main and lateral canals, and about 1,100 turnouts connected to these as well as drainage canals. The turnouts command 30 hectares each and farm ditches therefrom are directly operated and maintained by the farmers.

The AMRIS offices has been organized under the Regional Irrigation Office III in Bulacan. Figure B.2.2-1 and B.2.2-2 show the organization of RIO III and AMRIS Office, respectively.

2.2.2 Organization and Staffing of AMRIS Office

The functions and roles of staff in the AMRIS office are as follows:

(1) Main Office

The AMRIS main office is headed by Irrigation Superintendent V and comprises 91 staff in six Sections. Of these Sections, those directly concerned with O & M works in the field are the Equipment Sections, Water Control Coordination Section, and Operation and Maintenance Section.

The Equipment Section is responsible for general control and maintenance of heavy equipment and transportation equipment and also engages in the maintenance and repair works of diversion dams and main canals, etc. The Water Control Coordination Section is directly in charge of the Coordination work of water control in the whole area as well as of the water management at the diversion dams and the main canals, and also arrangement of water requirement to NPC.

The Irrigation Superintendent III as the chief of the O & M Section supervises three Zone Engineers and controls twelve (12) working stations.

(2) Working Station

Each working station is in control of four to five Divisions of 500 to 750 hectares each and, therefore, its standard total coverage is 2,000 to 3,750 hectares. In total, there are 55 Divisions in the area and these are taken care of by 350 staff in all. Duties of each working station are directed by Supervising Water Management Technologists (S.W.M.T.) as well as Water Management Technicians (W.M.T.) or Water Masters (W.M.), who are stationed in each Division. The Gatekeepers (G.K.), Ditchtenders (D.T.) and Pump Operators (P.O.) are also stationed in respective working stations.

2.2.3 Staffing

The assigned personnel of the AMRIS office are summarized as below:

<u>Designation</u>	<u>No. of Staff</u>
Irrigation Superintendent V	1 ^P
Assistant Irrigation Superintendent III	1
Administrative Section	29
Bill, Collection Section	20
Agricultural Coordinating Section	6
Equipment Section	23
Water Control Coordination Section	11
Operation and Maintenance Section	350
(S.W.M.T.)	(12)
(W.M.T.)	(56)
(G.K.)	(9)
(D.T.)	(266)
(Others)	(7)
<u>Total</u>	<u>411</u>

The profile of staffs is as follows:

Management staff	18
Professional, Technician	87
Clerical	40
Manual	296
<u>Total</u>	<u>441</u>

The staff assigned to the AMRIS Office are shown in detail in Table B.2.2-1.

TABLE B.2.2-1 NUMBER OF EXISTING STAFF (1/3)

Section & Unit	No. of Staff	Profile			
		M.S	P.T	Cl	Man'l
Office of the Chief					
Irrigation Superintendent-V	1	1			
Clerk II	1			1	
Office Helper	1*			1	
Coördetic Eng'g Aide	1*		1		
<u>Sub-total</u>	<u>4</u>	<u>1</u>	<u>1</u>	<u>2</u>	
Administrative Section					
Administrative Assistant	1	1			
Personal Aide	1			1	
Clerk I	3			3	
Property Custodian	1			1	
Casher I	1			1	
Casher Aide	1			1	
Accounting Clerk	1			1	
Electrician	1*		1		
Security Guard	1			1	
Radio Operator	2*		2		
Janitor	1				1
Utilityman	1				1
Laborer	5*				5
Clerk I	3*			3	
Clerk II	1*			1	
C.E Aide	1*			1	
<u>Sub-total</u>	<u>25</u>	<u>1</u>	<u>3</u>	<u>14</u>	<u>7</u>

Note : * : Daily Base Salary
M.S : Managerial or Supervising
P.T : Professional or Technical
Cl : Clerical Staff
Man'l : Manual Staff

TABLE B.2.2-1 NUMBER OF EXISTING STAFF (2/3)

Section & Unit	No. of Staff	Profile			
		M.S	P.T	Cl	Man'l
Billing & Collection Section					
Collection Analyst	1	1			
Collection Officer	1			1	
Billing Clerk	11*			11	
Bill Collector	6			6	
Machine Operator	1*			1	
<u>Sub-total</u>	<u>20</u>	<u>1</u>	-	<u>19</u>	-
Agric'l Dev. Coordination Section					
Agric'l Coord. Officer	1	1			
Clerk Typist	1			1	
Agric'l Liason Aide	1		1		
Water Management Techni'n	2*		2		
Watermaster	1*		1		
<u>Sub-total</u>	<u>6</u>	<u>1</u>	<u>4</u>	<u>1</u>	-
Repair & Improvement Section					
H.E.O	2		2		
Instrumentman	1			1	
Sr. Mechanic	2*		2		
Motorpool Dispatcher	1			1	
Machinist	1		1		
Driver	11*		11		
Auto. Serviceman	1			1	
Equipment Inspector	1*		1		
Carpenter	2				2
<u>Sub-total</u>	<u>23</u>	<u>1</u>	<u>17</u>	<u>3</u>	<u>2</u>

Note : * : Daily Base Salary
M.S : Managerial or Supervising
P.T : Professional or Technical
Cl : Clerical Staff
Man'l : Manual Staff

TABLE B.2.2-1 NUMBER OF EXISTING STAFF (3/3)

Section & Unit	No. of Staff	Profile			
		M.S	P.T	Cl	Man'l
Water Control Coord. Council					
Hydrologist	1		1		
Hydrologic Aide	1		1		
Sr. Gate Keeper	1				1
Gate Keeper	8				8
<u>Sub-total</u>	<u>11</u>	-	<u>2</u>	-	<u>9</u>
Operation & Maintenance Section					
Irrigation Supervintendent-III	1	1			
Irrigation Superintendent-I	1		1		
Irrigation Engineer	2		2		
Asst. Irrigation Engineer	1*		1		
C.E Aide	1*			1	
S.W.M.T (in Field)	12	12			
W.M.T or W.M (- do -)	56		56		
Gate Keeper (- do -)	9				9
Pump Operator (- do -)	3				3
Ditch Tender (- do -)	266				266
<u>Sub-total</u>	<u>352</u>	<u>13</u>	<u>60</u>	<u>1</u>	<u>278</u>
<u>Total</u>	<u>441</u>	<u>18</u>	<u>87</u>	<u>40</u>	<u>296</u>

Note : * : Daily Base Salary
M.S : Managerial or Supervising
P.T : Professional or Technical
Cl : Clerical Staff
Man'l : Manual Staff

FIGURE B.2.2-1 EXISTING ORGANIZATION CHART OF REGIONAL IRRIGATION OFFICE III

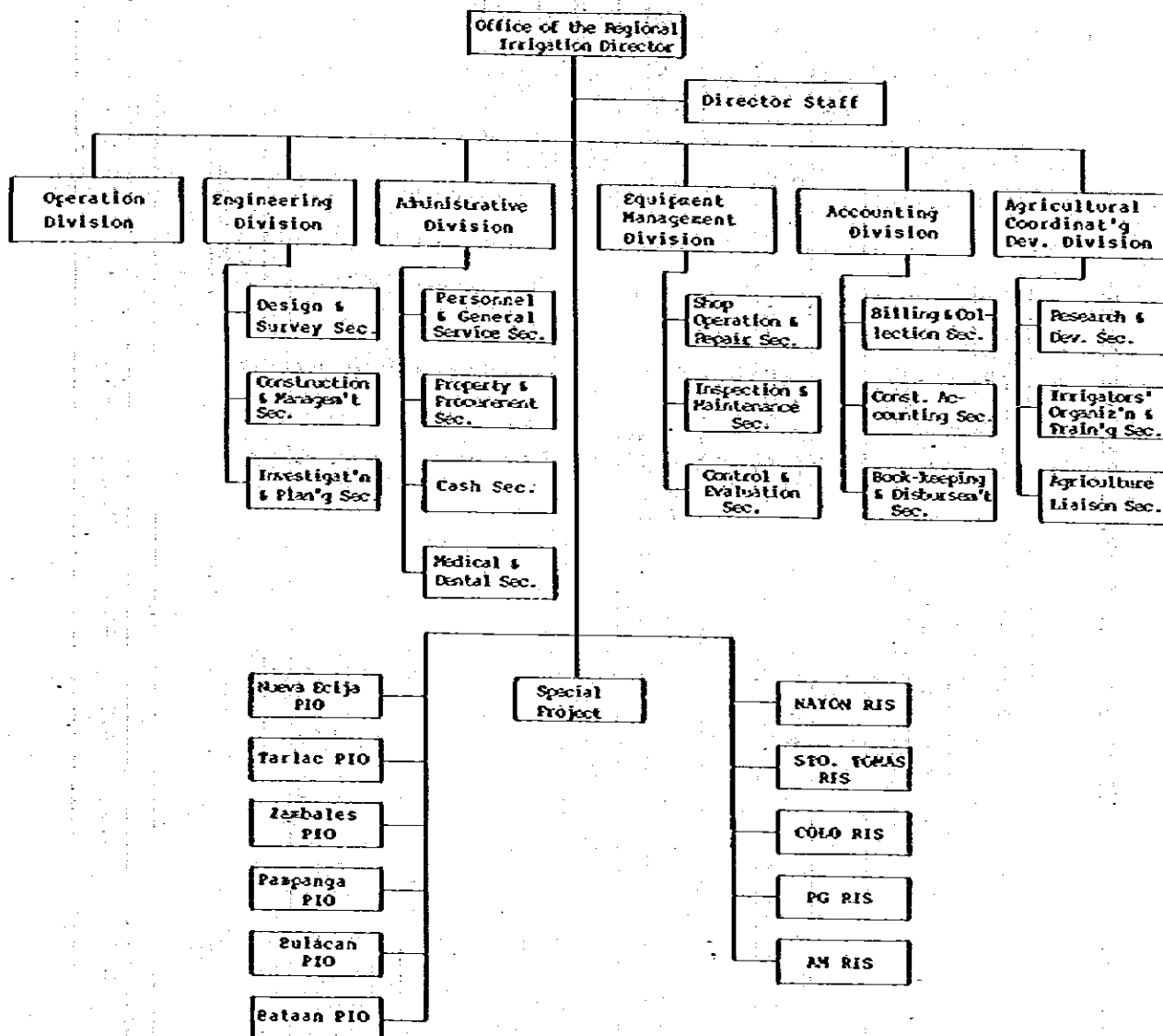
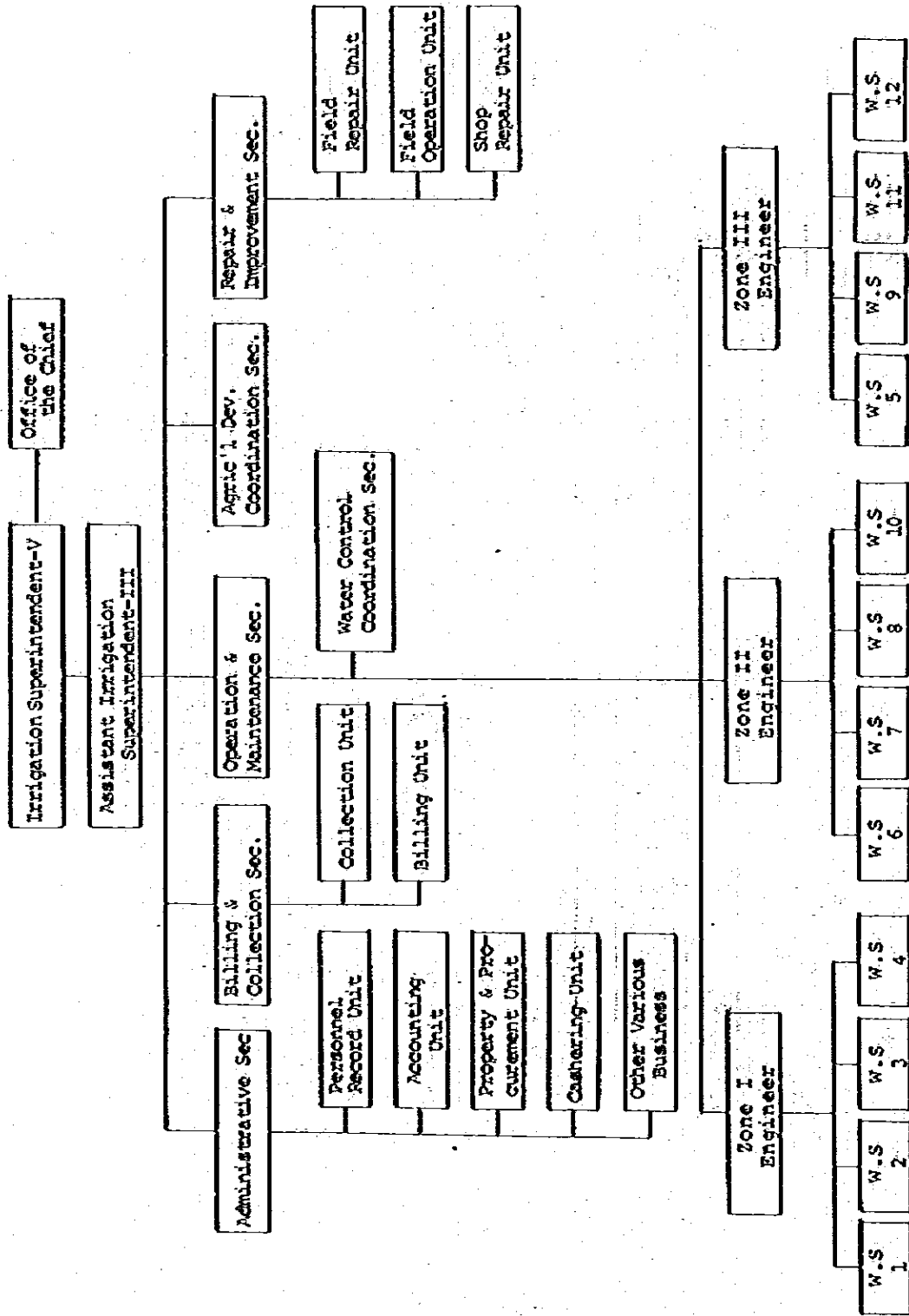


FIGURE B.2.2-2 EXISTING ORGANIZATION CHART OF AMRIS



2.3 Duties and Activities of AMRIS Office

2.3.1 General

Duties, responsibilities and actual activities of the operation and maintenance work at the main office and each working stations are stipulated in the rules, regulations and memorandum circulars of the government. Major activities of the works are general affairs, bill and collections of irrigation fee, operation and maintenance of irrigation and drainage facilities, and agricultural coordination among beneficiary farmers.

2.3.2 Duties and Responsibilities

Summary of the works in respective sections and working stations are described as follows:

(1) Main Office

1) Administrative section

- Management of personnel
- Accounting affair
- Revenue and expenditure control
- Property control
- Right-of-Way

2) Bill and Collection section

- Billing of irrigation fee
- Collection of irrigation fee
- Cashiering
- Treatment of collected in kinds

3) Agricultural coordinating section

- Promotion of pilot demonstration farm with a tie-up on NIA and BAYER
- Administrative instruction on training of irrigator's association (I.A.)

- Coordination of the government and private agency on modern agricultural technology assistance
- Attendance of farmer's meeting
- Follow-up on the implementation of upland crops

4) Equipment section

- Mobilization and operation control of equipment
- Shop and field repair and maintenance of the equipment
- Field operation of the equipment
- Evaluation and records keeping

5) Water control coordination section

- Preparation of water distribution schedule and its adjustments
- Coordination and negotiation between NIA and NPC on the water utilization
- Water control of Bustos Diversion Dam including operation of constant gate of North and South Angat main canal
- Each gate operating on the main canal by gate keeper
- Recording and monitoring on water management

6) Operation and Maintenance section

- Management of each working stations by three Zone Engineers under the direct supervision of Irrigation Superintendent III

(2) Working Stations

The working stations are directly in charge of the irrigation water management and the operation and maintenance of canal system (main-lateral-turnout). It engages in the collection of irrigation fee and also renders the practical aspect of the farming techniques. Each staff

is responsible for the following major duties:

1) SMWT

- Supervises various operation and maintenance activities within his area coverage.
- Reports to the Zone Engineer/Supt. III requests for additional irrigation supply or reduction of discharge for his working station.
- Controls the use and maintenance of working station facilities such as motorcycles, communication system, flashboards and office equipment.
- Controls gate operations, measurement discharges, canal patrolling and operation of flashboards.
- Settles farmers disputes passed on to him by the WMT's on matters pertaining to water use.
- Coordinates various government and private agencies in the promotion and development of agriculture in his area.
- Prepares, analyses and consolidates daily reports for his special reports to the Zone Engineer.
- Performs other duties that may be assigned to him by the Irrigation Superintendent V.
- Studies and plans improvement works within his area.

2) WMT/WM

- Assists CFA in the implementation of on-farm irrigation water management as follows:
 - a) Coordinates with compact farm leaders regarding the arrangement of cropping pattern and calendar, together with improved agricultural practices.

- b) To prepare and supervise the implementation of on-farm water distribution programs to optimize the use of irrigation water.
 - c) To promote maintenance of farm ditches, drains and farm roads.
 - d) To pacify/mediate on problems and disputes among farmers concerning water use, agricultural activities and schedules.
- Coordinates with agencies involved in providing the necessary services to the CFA within his area of jurisdiction as follows:
- a) To schedule and conduct meetings with CFA's to have a better grasp of the field activities and requirements.
 - b) To report on evaluation/accomplishment of agricultural programs to the SWMT.
 - c) Submit report to SWMT on the following:
 - i. Progress of land soaking, land preparation and transplanting.
 - ii. Irrigation, planted and benefitted lots, harvest reports, crop damages, recommended lots for exemption and other reports required.

3) Gatekeeper

- Under the direction of SWMT/WMT, performs the following tasks:
 - a) To operate headgates and turnout gates within his area of jurisdiction.

- b) To patrol canals, observe and record discharges in laterals, sub-laterals, turnouts; prepare and submit reports to SWMT.
- c) To operate and control canal checks.
- d) To clean and remove debris in front of canal checks, turnouts and measuring device.
- e) To perform other duties that may be assigned from time to time.

4) Ditchtender

- Under the direct supervision of WMT, D.T. performs the following:

- a) To maintain irrigation canal satisfactorily to meet the provisions set forth in MC 70's of 1972.
- b) To repair damage to defective canals.
- c) To patrol canal and submit reports on damages and repair/maintenance work.
- d) To operate turnout-gates chechgates within his area of jurisdiction.
- e) To perform other duties that may be assigned by SWMT/WMT.

2.3.3 Function of Operation and Maintenance Works

(1) Operation

The existing irrigation facilities in the Project Area consist of three (3) diversion dams, three (3) pumping stations and several numbers of main, lateral and sub-lateral canals and appurtenant structures. Besides, on-farm facilities such as main and supplemental farm ditches,

turnouts and drains are generally consolidated compared with other national irrigation systems.

System operations from diversion dams to turnout level are being performed successfully by staff of the operation and maintenance section headed by Irrigation Superintendent III, water control coordination section and working stations. On the other hand, operations of on-farm level facilities are executed by the beneficiary farmers concerned.

The sector gates of Bustos diversion dam are not being operated automatically because the mechanical system of the gates has not functioned well since 1959.

Gate operation of the Upper Maasim diversion dam which was constructed in 1949 became impossible and the gates were inevitably concreted in 1963 to keep the water level. Accordingly, the dam is badly affecting the upstream area during the flood period, though it is still working as the intake facility.

Irrigation canals which have appurtenant structures are working well with some exceptions. However, the operation status of each pumping system is maintained well which earns the appreciation of most farmers.

Annual system operation plans, which are composed of program of area and crops, cropping patterns, water delivery schedules, headgate diversions, target irrigation efficiency and extent of the area to be excluded from irrigable area, is being prepared based on the regulation and memorandum circular stipulated.

Preparation and submission of the reports at the system level, however, seems to require much hard work and

a great deal of time. Accordingly, the work should be reduced and simplified in order to execute more effective implementation of operation and maintenance works.

(2) Maintenance

Present maintenance work in the Project area is being performed by the staff of the operation and maintenance section, equipment section and each working station. Major tasks for diversion dams and pumping stations are the replacement of spare parts, overhaul and painting.

Grass cutting on main and lateral canals is usually carried out by permanently assigned ditchtenders on a given reach of a canal. Present practice of vegetation control, however, is very costly and not uniformly effective.

The essential point of better water management is the equitable delivery of water to each farm at the proper time. Concurrently, the amount delivered must be equal to cropping water requirements taking various stages of crop growth and effective rainfall into consideration.

In case of the AMRIS Project, however, proper distribution does not seem to be conducted so successfully. It is obvious from the fact that integrated irrigation efficiencies, which will be discussed in Appendix A, are only about 34 and 57 percent for the wet season and dry season, respectively.

In many instances operation of the canal systems and farm turnouts have been taken over by the farmers. They have dealt with manipulating gates, checking canals with banana logs or bamboos, and making their own diversions, through unauthorized and/or improperly located turnouts. The reasons for these are to serve high areas within service

area, right of way or maintenance problems among farmers using same farm ditch, and because it is more convenient to them.

Measuring devices in the project area are being operated in comparatively good condition except for some facilities since the consolidation has been completed in 1978 by the time of AMIADP implementation.

In many irrigation and drainage canals, there are sedimentation and siltation problems due to bank erosion and sloughing. Desiltation works are unsatisfactory because of the negligible budget allocated for this.

Heavy growth of aquatic vegetation and siltation has significantly reduced canal carrying capacity. Cleaning of vegetation from drainage and creeks is not being practiced as a maintenance activity.

Major problems of canal structures are lack of gates at some structures, scour and bank erosion below and around structure outlet transitions, gate problems due to damage, missing parts and general lack of routine maintenance.

Service roads along main canals and some laterals are being kept in good condition as compared to those along laterals and sub-laterals. Overtopping of the canal bank and road frequently occurs as a result of former over-checking. Besides, some road embankments along the canal are so low that they have become saturated and unstable from lateral over-checking.

In order to keep roads in a passable condition throughout the year, pavement of road is required over as long a stretch as possible. The need for gravel pavement will depend upon volume of traffic, availability of alternative

routes and requirements of beneficiary farmers.

(3) O & M Practices of Representative WMT in AMRIS

Actual operation and maintenance work of the representative water management technician in AMRIS was surveyed at twelve working stations. The major findings for this are described as follows and the results of the survey are presented in Table B.2.3-1.

Water Management Technicians account for 17 percent of the total staff and are only second to Ditch Tenders in terms of the composition of staff. Each Technician is assigned to a Division covering about 500 to 750 ha and takes responsibility for the O & M works of canals and other facilities as well as for giving instructions and assistance to compact farms. The Water Management Technician plays an important role in O & M works at the on-farm level. One of the best ways to gain understanding on the current state of O & M works, therefore, appears to be to hold an interview with these Technicians. The following questions were posed to 12 Technicians out of the total of 55 Technicians in the AMRIS area, each one of whom was selected randomly from each working station.

Type and Percentage Distribution of Duties of W.M.T.

	Annual Average	Harvesting Period (Irrigation not necessary)	Growing Period (Irrigation necessary)
Water Management	25.0	6.9	34.3
Maintenance and Repair Work	12.5	4.9	16.3
Grievance Procedure and Campaign	12.3	10.5	13.2
Preparation of Reports (Weekly and Monthly)	19.2	18.6	19.3
Collection of Irrigation Fee	<u>31.0</u>	<u>59.1</u>	<u>18.3</u>
	100.0	100.0	100.0

As is evident, a significant amount of effort and time is allocated to the collection of irrigation fee, particularly its proportion accounting for 59 percent in the harvesting period. On the other hand, the important works of O & M cover 25 percent on average.

Duties involved in water management, grievance procedure, and campaign are closely related and are so managed, and, therefore, they require interrelated countermeasures, for the undertaking of water management services alone would not allow the advancement of their technology.

The above information was derived from the personal judgement of individual respondents. O & M and repair works primarily include the inspection of canals, coordination of Ditch Tenders' works and direction of appropriate instructions.

TABLE B.2.3-1 O & M PRACTICE BY W.M.T. AT WORKING STATION

NO. OF W.S./ DIV.	Reporting		Settle Farmers Disputes		Operation Water		Maintenance		Collection of Irrigation Fee						
	Grow'g	Harv't	Grow'g	Harv't	Grow'g	Harv't	Grow'g	Harv't	Grow'g	Harv't					
I - C	16	16	20	42	27	32	-	-	0	32	42	36			
II - C	6.25	5.73	6	6.25	7.29	7	41.4	10.94	31	38.02	17.19	31	8.33	58.85	25
III - D	10.0	10.0	25	0	17	25	0	0	17	20	0	13	20	90	43
IV - B	14.0	14	1	1	1	15	-	-	10	30	-	20	40	85	55
V - B	19	19	15	7	12	29	15	7	24	15	7	12	22	52	32
VI - C	19	9	12	16	13	19	-	-	13	25	-	17	25	75	41
VII - B	27.27	28.57	28	9.09	9.52	9	54.54	9.52	39	-	-	0	9.10	52.39	24
VIII - C	37.20	37.20	37	4.60	0	3	38.76	0	26	19.38	0	13	0	62.8	21
IX - D	27	27	23	18	21	23	18	18	21	13	18	15	14	19	16
X - A	27.27	28.57	28	13.63	9.52	12	50	9.52	36	-	-	0	9.10	52.39	24
XI - B	15	20	20	10	17	50	10	-	36	-	-	0	15	60	30
XII - C	14.07	7.81	12	8.85	5.21	8	33.33	10.42	26	35.42	16.67	29	8.33	59.89	25
Total	19.33	18.57	19.16	10.20	10.46	12.25	34.25	6.95	25.00	16.31	4.90	12.50	16.90	59.11	31.0

NOTE:

1. Grow'g. Growing Season
2. Harv't. Harvest Season
3. Ave. Average
4. Growing Season = 8 months
5. Harvest Season = 4 months
6. Ave. = Growing % x 0.666 + Harvest % x 0.333

2.4 Collection Status of Irrigation Fees

2.4.1 Definition of the Irrigation Fees

NEDA Resolution No. 20 (Series of 1978) states the policy on the level of irrigation service fees.

Irrigation fees are to be established at levels that will:

- 1) Provide for total reimbursement of public investments on irrigation facilities within the maximum fifty years but excluding interest costs which the government will subsidize;
- 2) Provide for total coverage of working expenses incurred in the operation and maintenance of irrigation systems;
- 3) Not be a disincentive to farmers to avail themselves of the benefits of irrigation systems;
- 4) Be within the farmers capacity to pay.

Irrigation fees are set in cavans of palay or its cash equivalent at the prevailing government support price at the time of payment. Current fee rates stated in cavans (50 kg) of palay are as follows:

<u>Systems</u>	<u>Wet Crop</u>	<u>Dry Crop</u>	<u>Third Crop</u>
Gravity systems	2	3	3
Pump systems	3	5	5

2.4.2 Status of Irrigation Fee Collection

According to the information received from the AMRIS office concerned, the status of irrigation fee collection during the last six years is summarized below:

(Unit: Thousand peso)

Fiscal Year	Collectible Irrigation Fee	Collected Irrigation Fee		
		In Current	In back Account	Total
1977	6,541 (100)	2,890 (44)	636 (10)	3,526 (54)
1978	6,281 (100)	2,640 (42)	1,017 (16)	3,657 (58)
1979	7,940 (100)	3,446 (43)	1,021 (13)	4,467 (56)
1980	8,835 (100)	3,543 (40)	1,055 (12)	4,598 (52)
1981	10,046 (100)	4,953 (49)	1,383 (14)	6,336 (63)
1982	10,837 (100)	5,302 (49)	1,345 (12)	6,647 (61)

Source: Data in 1977, 1978 and 1979 from Status Report of Agricultural Development in AMRIS (1980 and 1982 from Bill and Collection Section).

Collection status of irrigation fees in calendar year 1982 is presented in Table B.2.4-1. The back account amounts, which is the accumulated unpaid irrigation fees for the past years, indicate they are about three times the collectible amount of 1982 irrigation fees. Out of which only four percent was paid by the failed farmers during the calendar year.

The relationship between crop intensity and collection efficiency are illustrated in Figure B.2.4-1 and B.2.4-2 in 1981 and 1982 respectively.

From those figures, it can be judged that the farmers in working station No.3, 9 and 10 who operated with high crop intensity does not meet high collection efficiency unlike those in No.2 and 12. This means insufficient efforts of promotion by the official concerned and poor farmers attitude.

The shares of irrigation fees collected in kind are quite small; only 3.5 percent of the annual collectible amount of the irrigation fees in 1982.

2.4.3 Major Reasons of Unpayment on Irrigation Fee Payment

The following are the reasons and related figures obtained directly by collectors through questionnaires from farmers associations randomly selected in the project area.

<u>Major Reasons</u>	<u>No. of Unpaying Households</u>	<u>Distribution (%)</u>
Financial or Economic Condition	86	44
Plenty of Loans	10	5
Low Production or Harvest	18	9
Lack of Irrigation and Drainage Facilities or Higher Land Level	40	20
Habitual or Institutional	13	7
Others (No Answer)	29	15
<u>Total</u>	<u>196</u>	<u>100</u>

The above results show that lack of payment due to low income accounts for the higher portion of 44 percent. It amounts to 58 percent if those farmers with plenty of loans

and poor harvest are included. Because of dissatisfaction with insufficient canal facilities, 20 percent of the farmers refused the payment. Included among those who cited lack of drainage facilities are the farmers who are not able to benefit from the supply of irrigation water since their farms are located in the area usually inundated throughout the year. Some farmers find it difficult to irrigate their lands because of the higher land level than the water in the canal.

TABLE B.2.4-1 COLLECTION STATUS OF IRRIGATION FEES (CY 1982)

(Unit : P 1,000)

Name of W.S.	Collectible Amount			Collected Irrigation Fees						Efficiency		
	R.B.B. (1)	Billing (2)	Ratio (2)/(1)	Current Account		Back New Account		Total (5)+(8)	(10) = (5)/(2)	(11) = (9)/(2)		
				Cash (3)	Kind (4)	Total (5)	Cash (6)				Kind (7)	Total (8)
1	1,391	1,187	1.17	609	45	654	124	15	139	793	55.1	66.8
2	2,316	990	2.34	588	2	590	129	1	130	720	59.6	72.7
3	3,155	1,018	3.10	412	-	412	171	-	171	583	40.5	57.3
4	3,301	1,044	3.16	529	-	529	202	-	202	731	50.7	70.0
5	2,704	851	3.18	408	-	408	115	-	115	523	47.9	61.5
6	4,690	1,139	4.12	488	122	600	85	-	85	685	52.7	60.1
7	2,420	886	2.73	465	4	469	71	2	73	542	52.9	61.2
8	2,192	724	3.03	327	11	338	43	-	43	381	46.7	52.6
9	3,623	765	4.74	315	-	315	81	-	81	396	41.2	51.8
10	2,974	766	3.88	259	24	283	56	2	58	341	36.9	44.5
11	2,634	869	3.03	389	-	389	141	-	141	530	44.8	61.0
12	1,854	593	3.13	301	1	301	103	3	106	407	50.8	68.6
Total	23,254	10,832	3.07	5,092	209	5,301	1,321	23	1,344	6,645	48.9	61.3

Note : R.B.B. : Receivable Beginning Balance

FIGURE B.2.4-1 CROP INTENSITY AND COLLECTED RATIO OF IRRIGATION FEES
 BY WORKING STATION AND DIVISION (1981)

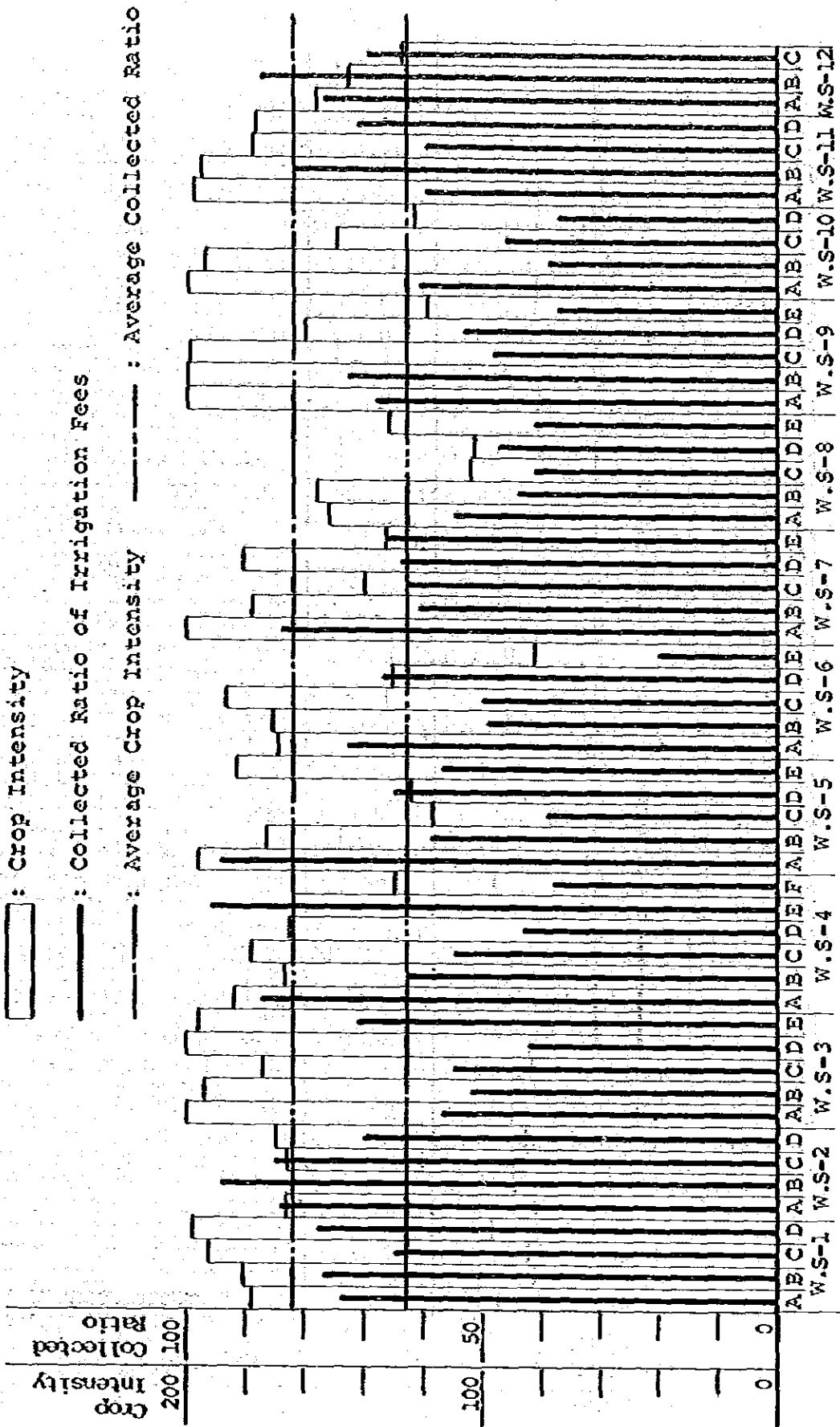
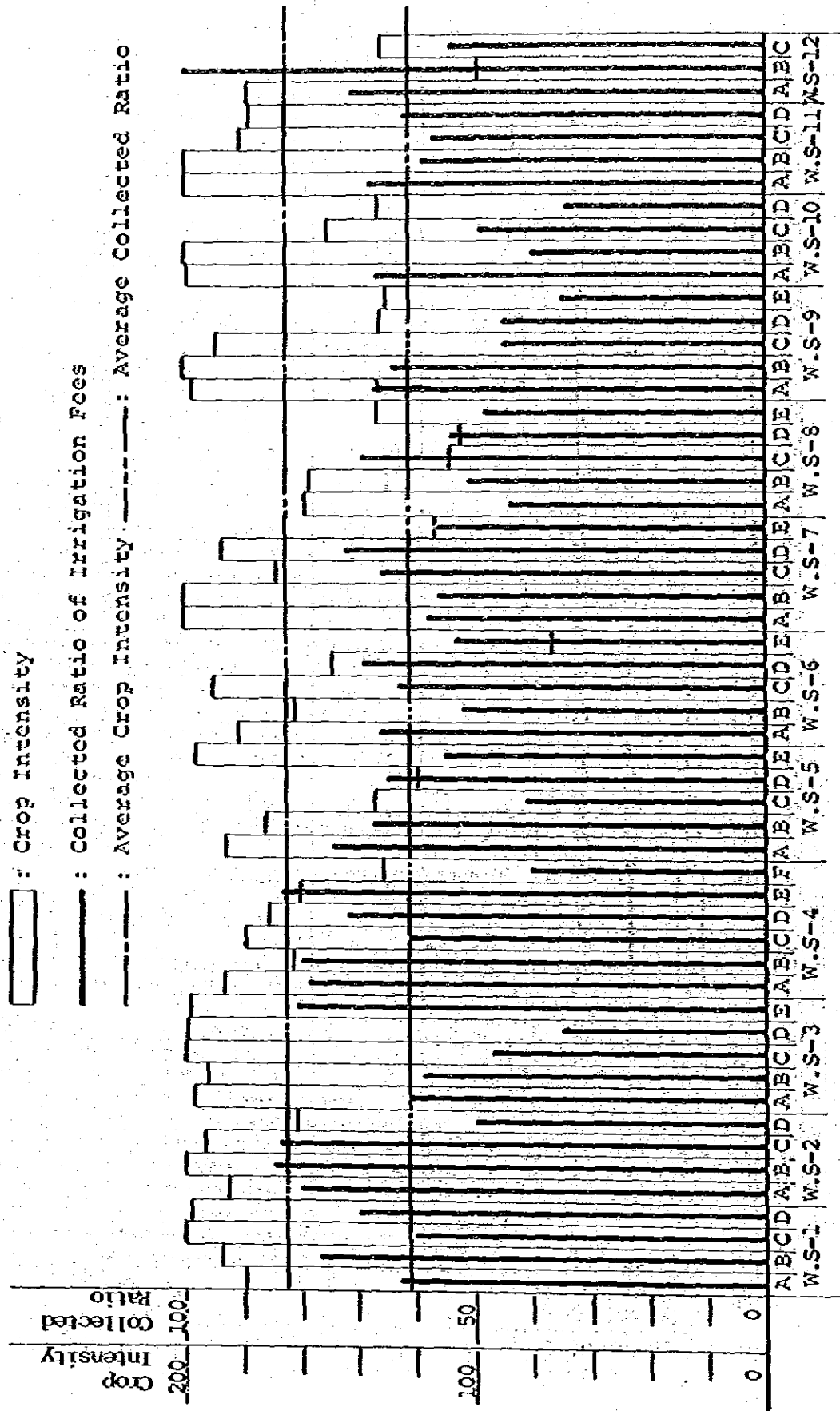


FIGURE B.2.4-2 CROP INTENSITY AND COLLECTED RATIO OF IRRIGATION FEES
BY WORKING STATION AND DIVISION (1982)



2.5 Revenue and Expenditure of AMRIS

Expenditures of AMRIS during the last four years from 1979 to 1982 is tabulated in Table B.2.5-1. The deficit ratio of balance between revenues and expenditures is about 27 percent as shown in the table. This is of course affected by low irrigation fee collection efficiency. Major items of the averaged annual expenditures are summarized below:

<u>Item</u>	<u>Amount*</u>	<u>Production</u>
1. Personnel service	P 5,467,000	70.9 %
2. Supply & materials	164,000	2.1
3. Water illumi. power	1,310,000**	17.0
4. Gasoline, oil	419,000	5.4
5. Others	350,000	4.6
<u>Total</u>	<u>P 7,710,000</u>	<u>100.0</u>

* Amount indicates average value during the last four years from 1979 to 1982.

** The amount includes electric power for three pumping facilities as well as office water supply and illumination costs.

A remarkably large share in the annual expenditures has been taken by personnel services of about 71 percent as compared with supply and material of 2 percent. For the provision of proper irrigation services, proportioned increase of maintenance within the limited budgets is required. Necessary countermeasures shall be made from view points of physical, financial and organizational aspects.

TABLE B.2.5-1 REVENUE AND EXPENDITURE OF OPERATION
AND MAINTENANCE IN AMRIS

	Unit: Thousand Pesos			
<u>Item</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
A. Revenue				
1. Irrigation fee	4,347	4,598	6,336	5,332
2. Others	98	14	16	1,700
<u>Total (A)</u>	<u>4,445</u>	<u>4,612</u>	<u>6,352</u>	<u>7,032</u>
B. Expenditure				
1. Personnel services	3,986	5,250	6,386	6,244
2. Travel expenses	33	43	59	32
3. Communication services	4	4	4	4
4. Repres't. transt. allowance	11	6	11	6
5. Insurances	40	0	101	192
6. Supply & materials	79	188	132	256
7. Water, illum. power service	548	1,538	1,415	1,738
8. Gasoline, oil	377	368	419	510
9. Special counsel allowance	196	80	190	373
10. Uniform allowance	0	8	8	0
<u>Total (B)</u>	<u>5,274</u>	<u>7,485</u>	<u>8,725</u>	<u>9,355</u>
C. Balance (A) - (B) = (C) (-)	829	(-) 2,873	(-) 2,373	(-) 2,323
D. Deficit ratio				
$\frac{(C)}{(B)} \times 100$	15.7	38.4	27.2	24.8

2.6 O & M Facilities and Equipments

2.6.1 Building Facilities

The building facilities of the AMRIS Office are the main office, twelve working stations, Bustos diversion dam operation house, two operation houses on Angat North and South main canal constant gates and gatekeepers' houses.

2.6.2 Heavy Equipments and Vehicles

The equipment section of the main office manages the mobilization, repair and maintenance of all heavy equipment for construction and rehabilitation works and the transportation vehicles utilized for O & M services of the systems under the control of NIA.

These contain 30 units of heavy equipment like bulldozers, backhoes, 47 units of light equipment, 8 units of jeeps and 150 motorcycles. The list of all equipment is presented in Table B.2.6-1. Operable and non-operable equipment is 46 units and 39 units respectively. Actual operation records for this equipment in 1981 and 1982 is also presented in Table B.2.6-2. The majority of the equipment listed in Table B.2.6-2 except item No.2, 16, 17 and 19 has exceeded its economic durable life because the equipment was procured at the time of the AMIADP implementation which was completed in 1978.

TABLE B.2.6-1 OPERABLE AND NON-OPERABLE EQUIPMENTS OF AMRIS

Item	Type	Operable Units	Non-Operable Units	Total No. of Units
1. TRACTOR CRAWLER	Komatsu D10P	2	-	2
	Komatsu D50P	1	-	1
	Komatsu D50A	1	3	3
2. CRANE	Truck Mounted	1	-	1
	Crawler	1	2	3
3. LOADER	Kinco	2	1	3
4. BACKHOE	Suimoto	3	-	3
	Hitachi UH07	1	1	2
5. MOTOR GRADER	Komatsu G022	1	2	3
	Komatsu G037	1	-	1
	Mitsubishi IG2H	1	-	1
6. ROAD ROLLER	Sakai	1	3	4
7. VIBRATORY ROLLER	Sakai	-	2	2
8. DUMP TRUCK	Toyota	2	9	11
	Hino	4	2	6
9. STAKE TRUCK	Toyota	2	2	4
	Hino	2	-	2
10. TRUCK TRACTOR W/ TRAILER	Hino	2	1	3
11. FUEL TANKER	Hino	-	1	1
12. PICK UP	Toyota	4	1	5
	Nissan	4	-	4
13. STATION WAGON	Toyota	1	-	1
14. JEEP	Toyota	4	-	4
	Killy's	-	4	4
15. LUBRICATION TRUCK	Hino	1	-	1
16. FORK LIFT	Komatsu	1	-	1
17. MOBILE SHOP TRUCK	ISUZU	1	-	1
18. PICK UP VAN	Hi Lux	1	-	1
19. CAR	Volkswagon	2	1	3
20. FARM TRACTOR	International H	-	4	4
<u>TOTAL NO. OF UNITS</u>		<u>46</u>	<u>39</u>	<u>85</u>

TABLE B.2.6-2 OPERATION RECORDS OF EQUIPMENT

(1/2)

Name of Equipment	Number of Operated	Purpose of Work	Classification of Facility	Distance/Hour Usage	
				1981	1982
1. Dump truck - Toyota (1975)	3	Haul filling materials	Service road along canal	15,305 kms	19,689 kms
2. Dump truck - Hino (1979)	5	- do -	- do -	50,606 kms	67,630 kms
3. Front End Loader - Kinco	2	Loading of filling materials	Quarry of stockpile	766 hrs	1,445 hrs
4. Stake Truck - Toyota	2	Haul construction materials	Various jobsites	9,116 kms	6,212 kms
5. Stake Truck - Hino	2	- do -	- do -	-	4,140 kms
6. Backhoe - Sumitomo	3	Desilting & excavation	Main canal & lateral	2,687 hrs	2,884 hrs
7. Backhoe - Hitachi	2	- do -	- do -	742 hrs	849 hrs
8. Crawler Crane - Sumitomo	1	- do -	- do -	150 hrs	359 hrs
9. Truck Mounted Crane - Linkbelt	1	Lifting & loading heavy materials	Various jobsites	29 hrs	218 hrs
10. Bulldozer - Komatsu	3	Clearing, side burrowing backfilling & stockpiling	Main canal, lateral and quarry	2,103 hrs	2,142 hrs
11. Grader - Komatsu GD22	1	Leveling	Service road along canal	68 hrs	71 hrs
12. Grader - Komatsu GD37 & Mitsubishi LG2H	2	- do -	- do -	690 hrs	283 hrs
13. Road Roller - Sakai	1	Compaction	- do -	46 hrs	69 hrs
14. Truck tractor w/ Trailer - Hino	2	Haul & transfer equipment / construction materials	Various jobsites and projects	5,103 kms	11,633 kms

B.2-31

- to be continued -

TABLE B.2.6-2 OPERATION RECORDS OF EQUIPMENT

(2/2)

Name of Equipment	Number of Operated	Purpose of Work	Classification of Facility	Distance/ Hour Usage	
				1981	1982
15. Station Wagon - Toyota	1	Service of Irrigation Superintendent V	Various places	27,675 kms	52,434 kms
16. Nissan Patrol Pick Up (1982)	4	Haul construction materials & palay. Service of field mechanics	- do -	-	50,993 kms
17. Toyota Pick Up FJ45 (1979)	5	Haul construction materials & palay	- do -	76,386 kms	87,839 kms
18. Toyota Land Cruiser FJ40 (1975)	4	Service vehicle for AMRIS personnel	- do -	72,325 kms	85,932 kms
19. Nissan Jeep KR 160 (1982)	2	- do -	- do -	-	37,415 kms
20. Forklift - Komatsu	1	Lifting heavy load	AMRIS Motorpool and Head Office	73 hrs	150 hrs
21. Hi Lux - Toyota	1	Service for NIA-Training Center personnel	Various places	-	17,475 kms
22. Car - Volkswagen	1	Service of AMRIS personnel	- do -	-	18,611 kms
23. Motorcycles - Yamaha	150	Service for AMRIS field	- do -	-	-

**CHAPTER III. STATUS OF ESTABLISHMENT OF
IRRIGATOR'S ASSOCIATION**

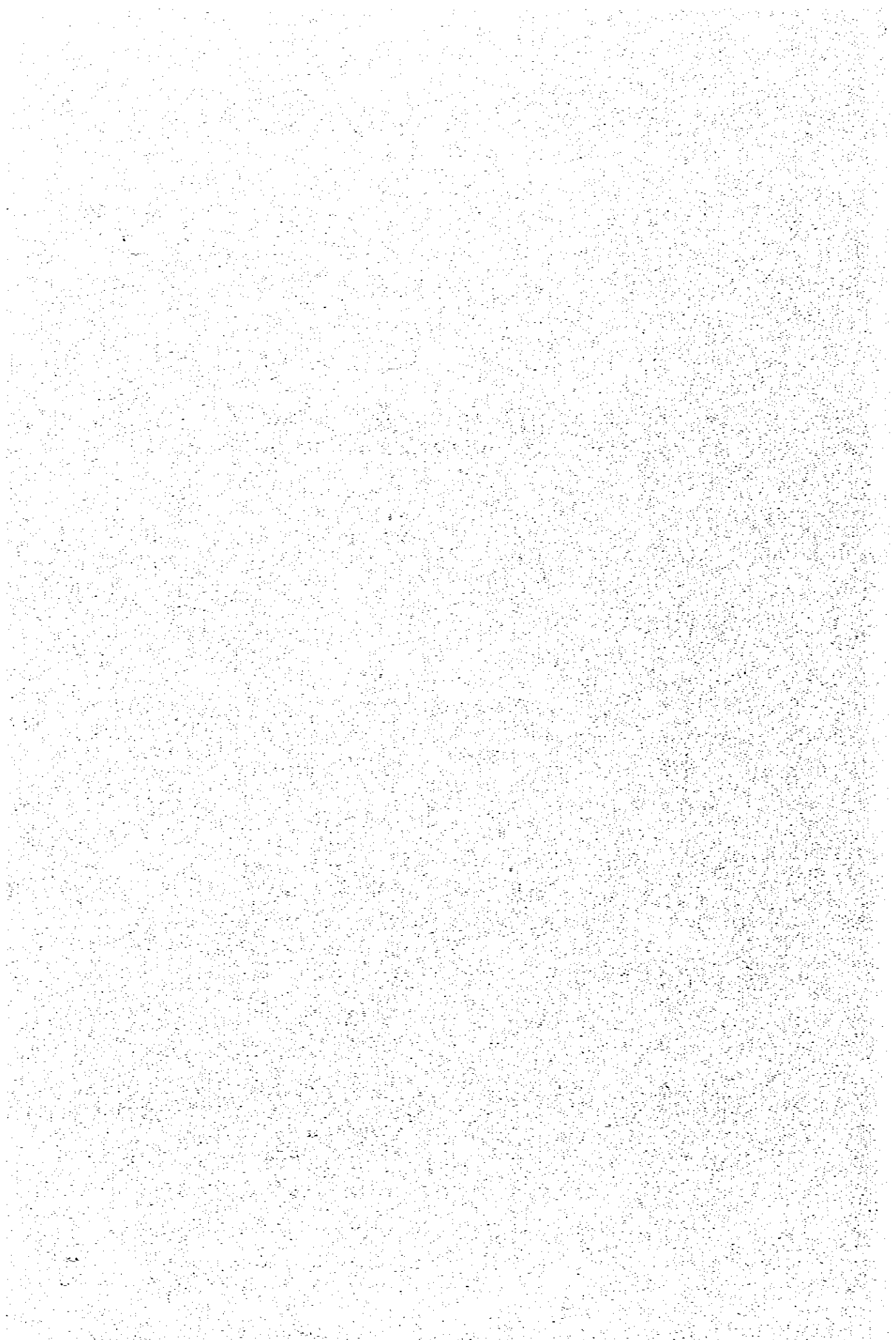
TABLE B.2.6-2 OPERATION RECORDS OF EQUIPMENT

(2/2)

Name of Equipment	Number of Operated	Purpose of Work	Classification of Facility	Distance/ Hour Usage	
				1981	1982
15. Station Wagon - Toyota	1	Service of Irrigation Superintendent V	Various places	27,675 kms	52,434 kms
16. Nissan Patrol Pick Up (1982)	4	Haul construction materials & palay. Service of field mechanics	- do -	-	50,993 kms
17. Toyota Pick Up FJ45 (1979)	5	Haul construction materials & palay	- do -	76,386 kms	87,839 kms
18. Toyota Land Cruiser FJ40 (1975)	4	Service vehicle for AMRIS personnel	- do -	72,325 kms	85,932 kms
19. Nissan Jeep KR 160 (1982)	2	- do -	- do -	-	37,415 kms
20. Forklift - Komatsu	1	Lifting heavy load	AMRIS Motorpool and Head Office	73 hrs	150 hrs
21. Hi Lux - Toyota	1	Service for NIA-Training Center personnel	Various places	-	17,475 kms
22. Car - Volkswagen	1	Service of AMRIS personnel	- do -	-	18,611 kms
23. Motorcycles - Yamaha	150	Service for AMRIS field	- do -	-	-

BB
NY
32

**CHAPTER III. STATUS OF ESTABLISHMENT OF
IRRIGATOR'S ASSOCIATION**



CHAPTER III STATUS OF ESTABLISHMENT OF IRRIGATOR'S ASSOCIATIONS

3.1 General

NIA is making efforts to improve operation and maintenance structures of the national irrigation systems in the whole country. One of the ways of improving O & M structures is to reduce the annual expenditures of the operation and maintenance works for the systems. This chapter presents results of survey and interview on the organization structures and operation status of the existing irrigator's associations.

3.2 Activities of Compact Farm Association in AMRIS Area

3.2.1 Formation of the Compact Farm Association

The formation of compact farm association was started in 1974, simultaneously with the construction activities of the project financed by ADB. For the year 1974, a total of 188 associations were organized.

From 1975 to 1978, the formation of associations accelerated and intensified to keep up with the timetable of project construction reaching a total of 1,016 associations at the end. In 1979, just after the project, an additional twenty five (25) associations were established and to date, altogether AMRIS has a total of 1,041 organized associations.

Purpose and criteria of the associations formation are summarized as follows:

- (1) Association has the capability to maintain and clean the farm ditches.

- (2) Association has the capability to schedule and handle water distributions of members.
- (3) Association has the capability to campaign and collect irrigation fee from members.
- (4) Association has the capability to resolve conflict on water distribution and maintenance of farm ditches among members.
- (5) Association has the capability to negotiate and coordinate their problem with NIA and other government agencies.
- (6) Association has the capability to promote and study the modern agricultural practices.

3.2.2 Activities and Functions

In order to gain an understanding of the current activities of compact farms, the following four questions were posed to 243 sample compact farms randomly selected in the project area.

- (1) Does leader exist as President in your compact farm and does your farm function well as a farmers' organization ?
- (2) Are there any farm ditches ready to be used in your compact farm and if so, are those ditches well operated and maintained by your compact farm ?
- (3) Are repair works to farm ditches well managed and is water distribution through these ditches effectively conducted ?
- (4) Is your compact farm active in the diffusion of farming techniques ?

The responses given to the survey are summarized respectively as follows:

1) Leader exists and the farm functions well	21
Leader exists, yet the farm does not function well	64
No leader exist and the farm does not function at all	15
2) Farm ditches exist and are well operated and maintained	18
Farm ditches partly exist, yet not operated or maintained well	72
No farm ditches exist and, therefore, no O & M works	10
3) Water distribution through farm ditches is efficient	29
Water distribution through partial use of farm ditches	66
No farm ditches exist and, therefore, no distribution	5
4) Always active in the diffusion	13
Previously and/or sometimes active in the diffusion	70
Not active at all in the diffusion	17

The survey results of the function of CPA presented in Table B.3.2-1.

Above mentioned results, however, are only a small fraction compared to actual activities because it will

be added subjectively by the interviewee.

Integrated evaluations of activities and function of the compact farm associations are tentatively pointed out based on field inspection, survey, discussions with officials concerned as follows:

- The associations were hurriedly established during the construction period and farmers were not given adequate orientation as to the proposed role and function of the associations.
- The associations were not organized on a formal basis and there were no written rules and regulations to bind the members of the associations.
- Majority of the beneficiaries farmers practice traditional farming without complete irrigation facilities at the on-farm level.
- The associations were not given adequate incentive and continuous support from concerned government agencies, since they have also farmers associations of their own, where the composition is different from compact farm associations.
- Minimal efforts were undertaken by the water management technician and other O. M. staff concerned but it is still not enough for the acceleration of farmer supports.
- Recently, honest development efforts were undertaken to consolidate and or federate various compact farm associations into irrigators association on a lateral canal basis for turn-over of the operation and maintenance to the associations.

Table B.3.2-2 is present situation of compact farm association.

TABLE B.3.2-1 FUNCTION OF COMPACT FARM

Name of W.S/DIV	No. of C.F.	Collected Irrigation Fee	Vitality of President / Chairman			Activity of Maintenance			Management Water			Extension Service		
			A	B	C	A	B	C	A	B	C	A	B	C
I-C	24	79	-	24	-	-	24	-	9	15	-	-	24	-
II-C	19	79	-	19	-	-	19	-	16	3	-	8	11	-
III-D	14	61	-	-	14	2	9	3	1	13	-	4	10	-
IV-B	21	62	8	11	2	5	13	3	4	15	2	4	7	10
V-B	25	59	9	11	5	7	13	5	7	13	5	6	19	-
VI-C	22	70	6	13	3	-	20	2	-	21	1	-	-	22
VII-B	21	67	2	17	2	6	15	-	1	20	-	-	21	-
VIII-C	17	44	7	10	-	7	10	-	-	17	-	-	17	-
IX-B	15	73	1	11	3	-	11	4	-	15	-	-	8	7
X-A	16	57	2	8	6	2	9	5	4	10	2	3	8	-
XI-B	21	82	16	5	-	14	7	-	18	3	-	1	20	-
XII-C	28	60	-	26	2	-	26	2	11	15	2	-	26	2
<u>Total</u>	<u>243</u>	<u>66</u>	<u>(51)</u>	<u>(155)</u>	<u>(37)</u>	<u>(43)</u>	<u>(176)</u>	<u>(24)</u>	<u>(71)</u>	<u>(160)</u>	<u>(12)</u>	<u>(31)</u>	<u>(171)</u>	<u>(41)</u>
			21	64	15	18	72	10	29	66	5	13	70	17

Note: A means well functioning.
 B means moderate functioning.
 C means poor functioning.

TABLE B.3.2-2 EXISTING SERVICE AREA, NUMBER OF COMPACT FARM AND NUMBER OF FARMERS (1)

<u>No. of W.S</u>	<u>Division</u>	<u>Area (ha)</u>	<u>No. of Compact Farm</u>	<u>No. of Farmer</u>
I	1-A-(1)		13	265
	1-A-(2)	746.21	21	463
	1-B	448.47	22	439
	1-C	418.53	25	501
	1-D	418.88	23	411
	<u>Sub-total</u>	<u>2,032.09</u>	<u>104</u>	<u>2,079</u>
II	A	650.65	28	652
	B	676.87	16	561
	C	689.03	19	533
	D	756.72	18	626
	<u>Sub-total</u>	<u>2,773.27</u>	<u>81</u>	<u>2,372</u>
III	A	571.33	13	464
	B	566.26	21	489
	C	541.78	22	430
	D	456.27	14	397
	E	534.80	14	430
	<u>Sub-total</u>	<u>2,679.44</u>	<u>84</u>	<u>2,210</u>
IV	A	541.20	19	436
	B	578.04	21	456
	C	593.67	21	444
	D	493.15	17	423
	E	524.57	22	431
	F	579.98	25	449
	<u>Sub-total</u>	<u>3,310.61</u>	<u>125</u>	<u>2,639</u>
	<u>Total</u>	<u>10,795.41</u>	<u>394</u>	<u>9,300</u>

TABLE B.3.2-2 EXISTING SERVICE AREA, NUMBER OF COMPACT FARM AND NUMBER OF FARMERS (2)

<u>No. of W.S</u>	<u>Division</u>	<u>Area (ha)</u>	<u>No. of Compact Farm</u>	<u>No. of Farmer</u>
V	A	373.29	13	369
	B	816.60	25	504
	C	437.07	10	244
	D	447.40	11	452
	E	476.93	18	364
	<u>Sub-total</u>		<u>2,551.29</u>	<u>77</u>
VI	A	509.64	27	376
	B	792.84	43	656
	C	635.17	26	408
	D	869.41	-	712
	E	1,240.94	-	812
	<u>Sub-total</u>		<u>4,048.20</u>	<u>95</u>
VII	A	405.46	18	329
	B	465.17	21	360
	C	531.02	22	348
	D	422.14	13	260
	E	794.82	33	424
	<u>Sub-total</u>		<u>2,608.61</u>	<u>107</u>
VIII	A	538.72	18	294
	B	558.00	21	283
	C	479.58	17	243
	D	424.71	17	230
	E	550.00	15	294
	<u>Sub-total</u>		<u>2,551.01</u>	<u>88</u>
	<u>Total</u>	<u>11,759.11</u>	<u>367</u>	<u>7,960</u>

TABLE B.3.2-2 EXISTING SERVICE AREA, NUMBER OF COMPACT FARM AND NUMBER OF FARMERS (3)

<u>No. of W.S</u>	<u>Division</u>	<u>Area (ha)</u>	<u>No. of Compact Farm</u>	<u>No. of Farmer</u>
IX	A	388.94	13	227
	B	465.20	15	350
	C	456.12	13	416
	D	498.19	13	278
	E	490.34	16	306
	<u>Sub-total</u>	<u>2,298.79</u>	<u>70</u>	<u>1,577</u>
X	A	518.37	16	411
	B	560.74	18	266
	C	500.17	15	360
	D	669.22	15	300
	<u>Sub-total</u>	<u>2,248.50</u>	<u>64</u>	<u>1,337</u>
XI	A	580.70	16	345
	B	655.05	21	359
	C	578.29	21	387
	D	523.41	14	372
	<u>Sub-total</u>	<u>2,337.45</u>	<u>72</u>	<u>1,463</u>
XII	A	707.34	25	544
	B	600.03	20	400
	C	737.90	29	595
	<u>Sub-total</u>	<u>2,045.27</u>	<u>74</u>	<u>1,539</u>
	<u>Total</u>	<u>8,930.01</u>	<u>280</u>	<u>5,916</u>
	<u>Grand Total</u>	<u>31,485</u>	<u>1,041</u>	<u>23,176</u>

3.3 Pilot Irrigators Association Project in AMRIS

3.3.1 General

The MASIKAP Irrigator's Association was selected as one of the sample survey projects for the mentioned purpose. The service area covered by the association is located at Barangay Dulong Ilog, Candaba, Pampanga. An area of some 200 ha is supplied with irrigation water from Lower Maasim diversion dam through the South main canal. The number of beneficiary farmers of the association is one hundred and nine (109) farm households.

3.3.2 Status of the Area before the Association Set-up

(1) Operation

The area served by South Main Canal is the most problematic area within the jurisdiction of working station No.7. It was due mostly to the insufficiency of irrigation water and incaring attitudes of farmers upstream. NIA personnel could hardly control the illegal checking upstream, perhaps due to the farmers dis-organization which have no concern to each other.

(2) Maintenance

The canal is satisfactorily maintained, but is sometimes neglected at collection time due to ditch tender assignment to collecting the irrigation service fee within the area.

Most of the farmers do not care to pay the irrigation service fee, hence the results of collection percentage is quite low.

3.3.3 Outline of Agreement between NIA and the Association

The memorandum of agreement was made on the transference of operation, maintenance, and collection of irrigation fees in the overserved by the South Main Canal to the association between NIA and the association of June 29, 1982.

Major stipulations of the agreement are summarized as follows:

- (1) The NIA has decided to turnover the O & M work and collection of irrigation fees and in return NIA shall pay the Association nine thousand pesos per annum and a three percent bonus of their collections provided they had collected at least a hundred percent of the current account in one year.
- (2) The association shall assume the responsibility for collecting irrigation fees from its members and the usual ten percent discount to early payers shall be decided by them.
- (3) The association shall also assume the responsibility for collecting irrigation fees from its delinquent members and in return NIA will give the association a ten percent bonus on these delinquent irrigation users.
- (4) NIA's Obligation
 - 1) To guarantee the supply of irrigation water both for dry and wet season crops up to turnout level and to provide the association with advance information in case of inability to delivery water.

- 2) To furnish the Association the total bills of members at least ten days before harvest and bills of unpaid irrigation fees of its members.
- 3) To provide technical supervision in the proper implementation of the agreements.
- 4) To appoint collectors who will give official receipts to the members of the association.

(5) Obligation of the Association

- 1) To clear, maintain and provide minor repairs to irrigation service canals and structures under contract and to include farm ditches and drains.
- 2) To appoint a common irrigator who should manage water distribution to individual farms.
- 3) To submit to NIA a weekly report listing Irrigated and Planted areas and duly signed requests for water deliveries from its members.
- 4) To serve irrigation fee bills and to collect irrigation fee among individual members.

3.3.4 Evaluation of Development after the Association Set-up

(1) Water Distribution

The chairman of each compact farm is responsible for water distribution as per schedule. Temporarily, they assigned one common irrigator to take charge of irrigation water to the whole area. Irrigation water now is properly distributed to the whole service area. Schedule of water release is strictly followed by them.

(2) Attitude of Farmers in Terms of Association and the Benefits Derived from the Association

- 1) Farmers concerned work as a group at least twice a month in clearing the canal. They also do some minor repair works and properly maintain the cleanliness of the canal.
- 2) The association developed adequate understanding and appreciation among members.
- 3) Each member recognizes the wise use of irrigation water, credit and farm inputs.
- 4) Disputes among members over association water use are being solved.

3.3.5 Financial Status of the Association
(as of the end of 1982)

(1) Income

Income through NIA	P	3,000	(57)
Threshing		2,000	(37)
Others		300	(6)
<u>Total</u>		<u>5,300</u>	<u>(100%)</u>

(2) Expenditure

Seminar	P	1,474	(36)
Meeting		744	(18)
Printing		458	(11)
Maintenance		101	(3)
Others		1,323	(32)
<u>Total</u>		<u>4,100</u>	<u>(100%)</u>

(3) Balance

P 1,200

About 65 percent of total expenditures are used for seminar, meeting and printing fees.

3.3.6 Collection of Irrigation Service Fee

The collection of the irrigation service fee reached about 72 percent and 74 percent in the wet and dry seasons in 1982 instead of 60 percent before the establishment of the association. Furthermore, the majority of the members follow the rules and regulations promulgated by the association.

3.4 Activities of Communal Irrigation Systems

3.4.1 General

The following survey and interviews on communal Irrigation Systems were conducted by the study team with the NIA officials concerned during the course of the field survey period.

<u>Name</u>	<u>Service Area</u>	<u>No. of Farmers</u>
Pacawacaw C.I.S.	200 ha	80
Caingin C.I.S.	35	24
Ilog-Bacod C.I.S.	45	32

As a result of the survey, a summary of the information received from the system's members through interview is described below. The summary presented procedures of C.I.S. implementation inclusive of before construction and present status of operations for Pacawacaw C.I.S. which is one of most representative of the systems.

3.4.2 Request of the Project Formulation

As a rule, the application documents for the preparation of project formulation are submitted to NIA' regional office through the provincial irrigation office by the representatives of beneficiary farmers.

NIA' Provincial Irrigation Office carries out a reconnaissance survey on the objective area after the application documents are received from the farmers representatives. If the proposed project is technically and economically feasible as a result of preliminary survey and study, P.I.O. of NIA will commence a detailed survey, investigation and design works with assistance from engineer groups in the regional office concerned.

3.4.3 Implementation of Construction Works

A budget inclusive of cost estimates and contract procedure of the construction works and construction supervision is carried out by the staffs of P.I.O. Also, before or during the implementation of the project, the farmers group which requested preparation of project formulation, will establish communal irrigation association in accordance with the laws and regulations stipulated by the government.

3.4.4 Conclusion of Agreement between NIA and the Association

The agreement on turnover of the facilities shall be made between NIA and the Association. The major items of the agreement consist of on system operation and maintenance, amortization of construction investments and operation of the association. As a rule, the national government subsidizes the investment cost of ten percent more or less and/or necessary cost of pre-construction work.

3.4.5 Project Features

(1) Service area:	200 ha
Irrigated in wet	50
Irrigated in dry	200

Part of inundated area utilized as fishponds.

(2) Facilities:

Checkgate type intake :	2 units (newly constructed by the project)
Main canal	: 1.5 km
Lateral canal	: 5.1 km with five routes

(3) Project cost (FY 1977)

<u>Item</u>	<u>Government Subsidized</u>	<u>Farmers Burden</u>
Civil Works	-	P 51,088.55
Engineering	P 5,489.17	-
Administrative	-	-
<u>Total</u>	<u>P 5,489.17</u> (9.7%)	<u>P 51,088.55</u> (90.3%)

3.4.6 Activities of the Association

The association has been established and registered based on the guidelines of May 19, 1977. The organizational set-up and articles of the association were completely made in accordance with laws and regulations.

Operation of the association has been executed smoothly by the president and six group leaders who were selected from farmer members. Major activities of the association are rehabilitation of irrigation facilities, canal cleaning and grass cutting once a crop season by the members themselves without payment of wages, and collection of the irrigation service fee and amortization of construction investment.

The characteristic activities of the association are assessment of ability to pay the irrigation fee and amortization for farmers whose production suffers flood damage and so on. The assessments are conducted by the representatives of the association, who are composed of the president and six group leaders selected by the farmers.

3.5 Irrigation Community Organization Programs (ICOP)

3.5.1 Manning Schedule and Development Strategy

The Irrigation Community Organization Program was initiated in November 1980 in Riconada Buhi-Lalo (BIAD III) Project (a target irrigable area of about 3,000 ha) as a pilot implementation in response to the challenge the NIA had long grappled with, which is "how to build and sustain viable farmer organizations that are capable of distributing water, maintaining channels and resolving conflicts."

The conceptual framework behind the response is the interlocking of a viable organization technology with the technology of irrigation development and systems' management. Reflecting this objective, the project aimed to encourage the farmers group participation in the construction of new and rehabilitation of present irrigation systems so that they eventually organize themselves formally into Irrigator's Association to manage the operation and maintenance works.

Personnel hired for the Program comprised 17 Irrigation Community Organizers (ICOs), 1 ICO Supervisor and 2 Community Organization Specialists. The Program expanded later to 11 systems under NISIP rehabilitation and 1 Project (Sibuguey Valley Irrigation Project) with the recruitment and training of new ICOs and other personnel.

To date, the Program has been implemented in 3 Projects and 11 systems for a total service area of about 25,015 hectares with 25,931 farmers. The current status of personnel directly engaged in the Program operation has been reported as follows:

A. Central Office:	2 Program Consultants
	6 Program Supervisors (2 newly hired)
	2 Training Specialists (1 newly hired)
	1 Action Research Specialist
	2 Clerks
	1 Utilityman
<u>Sub-total</u>	<u>14 Personnel</u>
B. Regional Level:	13 Irrigator's Organization Specialists and/or ICO Supervisors
C. Field Level:	105 Irrigation Community Organi- zers
<u>Grand Total</u>	<u>132</u>

The existing status, however, poses a gap between (1) the IOS and ICOs demand for capability build-up on both supervision and frontline organizing work and (2) the support of Central Office Staff or core group who could intensively and more frequently provide technical assistance at the regional and field level for the Program.

The requirements for Program operations require the presence and assistance of a Central Office support staff every two weeks per region whereas the actual visit made by the current staff is only once every 3 months. With the additional 2 Program Supervisors hired recently, a total of 6 of them are deployed as follows for successful implementation of the Program.

	<u>Regions</u>	<u>Aggregate Hectares</u>	<u>Total Farmers</u>	<u># of ICOs</u>	<u># of ICOs</u>
1. 2 Program Supervisors	I, II, III, IV	7,127	8,785	4	32
2. 2 Program Supervisors	V, VI, VII, IX	10,081	10,195	6	45
3. 2 Program Supervisors	X, XI, XII	7,807	6,950	3	28
	<u>Total</u>	<u>25,015</u>	<u>29,931</u>	<u>13</u>	<u>105</u>

As presented above, the Irrigation Community Organizers are deployed in 11 NIA regions and an about 238 hectares with 10 turnout service areas on average per 247 farmers.

In keeping with the Program's concept of organization, deployment strategy has been instituted at 4 levels; rotational area organizing, lateral area organizing, zone association organizing, and federation.

This strategy allows a bottom to top organization process of irrigator's association among farmers who participate in the identification of related issues and the development and implementation of plans to resolve these issues.

3.5.2 Accomplishments and Training Programs & Workshops

1) Accomplishments of Program

Program implementation for Riconada Buhi-Lalo Project started by 17 ICO's gave rise to the organization of three associations that entered into a Contract with NIA for the O & M of portions of the total system. For the bottomline operations, ICO's operate in rotational areas encouraging the farmers to take part in pre-construction and/or construction activities. Along with this capability building

program for the frontline such as ICO Pre-Development Program and Supervising Training have been carried out for ICO participants, IOS, ICO Supervisors, and Area Supervisors. Various program support development activities were also conducted; Irrigation Committee, National Orientation Workshop, Regional Irrigation Committee Orientation and Installation Workshop and Integrated Planning Workshops.

Efforts for manpower development were also made in recruiting qualified ICO's who demonstrated through tests and interviews, the existing and potential leadership, communication and problem-solving capabilities.

2) Training Programs & Workshops

a) Frontline Organization Work

Irrigation Community Organizers underwent on the average a 16-day live-in pre-deployment training program consisting of the orientation to NIA, the rationale of the ICO program, their roles and functions, and basic knowledge and skills in organization work, the major area of concern of ICO's. In later training program, the emphasis shifted to skills acquisition in direct organizing work away from theoretical principles of community organization.

b) Supervision of Organizing Work

A 15-day training program was conducted for supervisors for their successful on-the-job supervision of ICO's organizing work in the field.

The Program comprised a job analysis, identification of the supervisor's management roles and functions, and modules on particular leadership style to be practiced in their job.

c) Central Office Capability-Building

Five ICO identified by the Farmers Assistance Department were trained by the ICO Consultants to act eventually as the core group at the Central Office which shall assist the regional and project level groups. The training involved on-the-job technology-transfer making use of ICO program activities to develop their skills in designing, implementation, documentation, and evaluation of capability-building programs.

3) Interface Development Programs

In order to enhance the level of understanding and support for the ICOP by the concerned groups, the following activities have been conducted.

Orientation programs were conducted for key NIA personnel at the Central, regional and project levels to elicit the reactions of various management groups (National and Regional Irrigation Committees) to the ICOP and to further improve the ICOP strategies given their experiences in similar programs. Project management of the pilot area (Rinconada Bahi-Lalo) was also invited to share with the national level management group (NIC) their experiences in implementing the program.

4) Integrated Planning Workshop

As noted before, collaborative behaviour in the project or field level is dispensable for the successful ICOP. Toward this end inter group problem-solving processes have to be established among different task groups (engineers,) O & M personnel and the ICO's) if they are to cope effectively with the problems presented by end-users of the irrigation system. To allow for a clear understanding of

each group's contribution to the farmers' effort, a 5-day integrated planning workshop was conducted in each region which yielded a project plan for group work programs.

Program objectives for integrated planning workshop covered orientation and feedbacking with respect to ICOP, identification of each groups' work contribution to program implementation and development of an integrated project level plan. The workshops were helpful in delineating participant's individual roles and functions in the ICOP execution.

Feedback received after the capability-building and other support programs have been implemented cite such accomplishment as generated saving, increase in irrigation service fee collection, farmers taking part in earth-moving activities (otherwise done by NIA), etc.

3.6 Farmer Irrigation Organizer Project (FIOP)

3.6.1 General

ICOP implementation discussed in the previous section requires the use of professional ICOs, which incurs as of March 1983 a direct organizing cost of P 6.50 per ICO per hectare per month. Assuming that the organizing work by ICOs takes 36 months at the minimum before O & M responsibilities are turned over to the Irrigators Associations, the direct organizing cost alone is prohibitive for operating and maintaining current national systems with an aggregate area of about 470,000 hectares.

In search for a viable ICOP complement which does not sacrifice the NIA's objectives for farmers' organization, the Farmer Irrigators Organizer Project (FIOP) has been proposed as an approach to substantial cost reduction wherein farmers themselves are mobilized as organizers.

FIOP is proposed to complement the ICOP's frontline organizing manpower and potentially to draw from the current ICOs of ICOP and other O & M personnel the qualified leaders or supervisors of the farmer irrigator organizers.

3.6.2 Project Rational

- Under the project, a FIO will be deployed for an average area of about 105 hectares. With the P 400.00 travel/incentive allowance, per month per FIO, the direct organizing cost is only about P 4.00 per month per hectare vis-a-vis P 10.45 for an ICOP.
- Training and staff development efforts for irrigator's organization area given to the irrigators themselves who directly develop the organizing

capabilities among members of the irrigation community for formation of Irrigator's Association.

- PIOs who are selected from the local community have advantages over the external ICOs because of their knowledge and familiarity of the irrigation and contract-building.
- The project hastens farmer's reliance on themselves for organizational capabilities. The leadtime for the formation of Irrigator's Association will be shortened.

3.6.3 Project Area of the Samples

The project area covers Prac-Gumain IS and BPIP-AMRIS. The former deploys 9 PIOs for a total area of 849 hectares with 821 farmers whereas the latter has 10 PIOs for a total area of 1,076 hectares with 871 farmers.

3.6.4 Project Objectives

Under the general objectives of establishing irrigator's associations and increasing productive interaction between NIA and the irrigator's group/organizations, the urgent and specific objectives are:

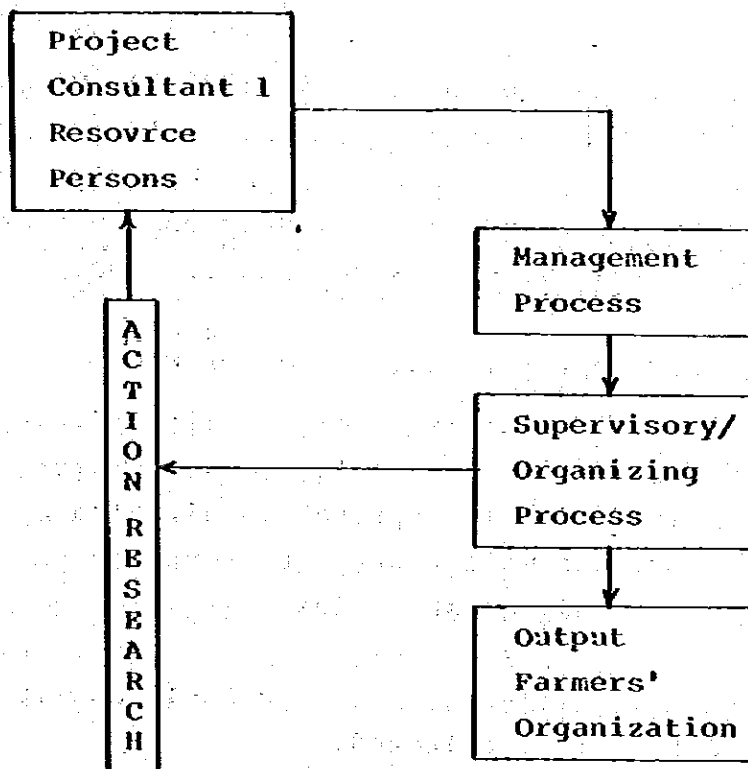
1. To organize and develop a Project Management Team (PMT) which will have responsibility for overall planning, direction and control of the FIOP;
2. To designate PIOs and develop project capabilities for FIO supervision;
3. To install a coordination mechanism for the alignment of all activities of field personnel in the project area;

4. To identify, select, train and develop 27 FIOs for the organization of farmers in the gravity and pump systems deployment areas; and
5. To document activities of the Project at three levels (the PMT level, FIO Supervisor - FIO level, and FIO Irrigators Groups/Association level) through the Action Research Methodology.

3.6.5 Project System and Components

1) Project System

The conceptual framework of FIOp management and implementation is presented below:



To provide the PMT with comprehensive data on the project's process, action research will document the project's supervisory and organizing activities and

draw insight from the status of the farmers' organization through the use of external consultants. Through action research in the FIOP implementation, a great deal of leaning will be gained in farmers' organization with FIOs, organizing process of the FIOs, training and development requirements for the FIOs, nature and methods of FIO supervision, and regional/system-level project management.

2) PMT Organization

The PMT organized for planning and directing FIOP activities in the two project areas will consist of the O & M chief of PGRIS, the irrigation superintendent of AMRIS, the AOC chief, the FIO Supervisor, and the Regional Irrigation Director.

The PMT executes management functions under the guidance of the FIO supervisors engaged in organizing the FIOs and coordination between the organizing groups and O & M personnel, assesses their experiences, draw conclusions and work out methods to improve its management of FIOP.

3) Recruitment, Development, Utilization of FIOs

The selection process starts from the list of farmer irrigators nominated by the Watermasters and/or Water Management Technicians. Field approval is directed by the PMT and approved nominees will undergo a group screening process to ascertain their capabilities.

Eventually nineteen (19) FIOs (9 for PGRIS and 10 for AMRIS BPIP and BPE) will be selected.

A pre-deployment training and workshop will be conducted for the selected FIOs to enable them to develop knowledge and skills necessary for farmers' organization so

that they will be able to carry out the following:

- a. To establish a systems physical profile and its boundary as well as the socio-economic profile of the potential members of the irrigation community;
- b. To conduct house to house visits to establish contact and also to gather data on farmers irrigation problems and aspirations;
- c. To assist irrigators groups in the identification of potential leaders to mobilize farmers' participation in problem solving efforts on irrigation related issues;
- d. To coordinate with the Technical Staff (O & M personnel) regarding farmers' problems on system's operation and maintenances;
- e. To assist leaders in holding meetings and organizational processes for effective group function; and
- f. To attend meetings and staff development activities and submit necessary reports related to the organizing works:

An FIO will be deployed for an area of 100 hectares with about 3 or 4 turnouts service areas.

The FIOs will adopt a bottom to top participative approach to organization on four levels; rotational area organization, lateral/main canal groups' consolidation, association formation, and federation.

4) Action Research

Action Research meant to improve the PMT's management process relative to the objective of the FIOP documents the experiences of the project personnel so that insights and learning will guide current project implementation and replication of the project in order systems.

Both the PMT and the ART collaborate on setting up the framework for the Research as well as jointly utilizing the gathered research data for planning. The PMT implements plans and ART monitors and documents the implementation for future joint planning. A four-month cycle of research is proposed of data gathering, data preparation and analysis, and data feedback to the PMT and joint planning.