No.

JAPAN INTERNATIONAL COOPERATION AGENCY

NATIONAL IRRIGATION ADMINISTRATION
THE REPUBLIC OF THE PHILIPPINES

THE STUDY ON STRENGTHENING OF NIA's MANAGEMENT SYSTEM

FINAL REPORT

VOLUME II : APPENDIX

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LIST OF REPORTS

Volume I MAIN REPORT

Volume II APPENDIX

Chapter

I : Capacity Improvement Plan for NISO

II : Irrigation Inventory and GIS Database

III : Farmers' Intention Survey

IV : Survey on NIA Corporate Culture

V : PCM Workshops

VI : Study on Integration of Regional Offices and Provincial Offices/NISO

VII : Reference Data

- VII.1 NIA Corporate Plan
- VII.2 Financial Projection Data
- VII.3 Personnel Data (Functions of NIA's Offices)
- VII.4 Legislations Related to NIA Management
- VII.5 Status of Implementation of the AFMA of 1997

LIST OF ACRONYMS

(A)	AA	Assistant Administrator
	ABRP	Agricultural Bureaucracy Restructuring Plan
	ACPC	Agricultural Credit Policy Council
	A&D	Alienable and Disposable Land
	ADB	Asian Development Bank
	AFMA	Agriculture and Fisheries Modernization Act
	AFMP	Agriculture and Fisheries Modernization Plan
	AGRICOM	Congressional Commission on Agricultural Modernization
	AIOO	Area Irrigation Operations Office
	ALLP	Amendment to the List of Lots Planted
	AMRIS	Angat-Maasim Rivers Irrigation system
	AO	Administrative Order
	ARC	Agrarian Reform Community
	ARDOMA	Association of Regional Directors, Operations Managers and Assistants, Inc.
	ARMM	Autonomous Region for Muslim Mindanao
	ASEAN	Association of Southeast Asian Nations
	ATI	Agricultural Training Institute
(B)	BA	Benefited Area
	BAC	Bids and Awards Committee
	BAI	Bureau of Animal Industry
	BAR	Bureau of Agricultural Research
	BAS	Bureau of Agricultural Statistics
	BFAR	Bureau of Fisheries and Aquatic Resources
	BSA	Bill & Statement of Account
	BSPP	Balikatan Sagip Patubig Program
	BOD	Board of Directors
	BPI	Bureau of Plant Industry
	BPRE	Bureau of Post-harvest and Research and Extension
	BSWM	Bureau of Soils and Water Management
(C)	CAR	Cordillera Administration Region
	CARP	Comprehensive Agrarian Reform Program
	CBSO	Corporate Board Secretary Office
	CD	Controllership Department
	CDA	Cooperatives Development Authority
	CDF	Countryside Development Fund

	CE	Collection Efficiency
	CI	Cropping Intensity
	CIA	Council of Irrigators' Associations
	CIS	Communal Irrigation System
	CMD	Construction Management Department
	CO	Central Office (NIA)
	COA	Commission on Audit
	COB	Current (or Corporate) Operating Budget
	CODA	Cotton Development Authority
	CORPLAN	Corporate Planning Staff
	CSC	Civil Service Commission
	CY	Calendar Year
(D)	DA	Department of Agriculture
	DAR	Department of Agrarian Reform
	DBM	Department of Budget and Management
	DECS	Department of Education, Culture and Sports
	DENR	Department Environment and Natural Resources
	DILG	Department of the Interior and Local Government
	DOF	Department of Finance
	DO	District Office
	DOH	Department of Health
	DOLE	Department of Labor and Employment
	DOST	Department of Science and Technology
	DPWH	Department of Public Works and Highways
	DRD	Dam and Reservoir Division
	DSD	Design and Specifications Department
	DSWD	Department of Social Welfare and Development
	DTI	Department of Trade and Industry
(E)	ECC	Environmental Compliance Certificate
	EDCOP	Engineering Development Corporation of the Philippines
	EDP	Electronic Data Processing (Section of MIS Division/ Corplan)
	EIA	Environmental Impact Assessment
	EMB	Environmental Management Bureau
	EMD	Equipment Management Department
	EO	Executive Order
(F)	FIDA	Fiber Industry Development Authority
	FIO	Farmer Irrigation Organizer
	FO	Field Office

	FPA	Fertilizer and Pesticide Authority
	F/S	Feasibility Study
(G)	GAA	General Appropriations Act
	GATT	General Agreement on Tariffs and Trade
	GDP	Gross Domestic Product
	GIDP	Groundwater Irrigation Development Project
	GIS	Geographic Information System
	GOCC	Government-Owned and Controlled Corporation
	GOJ	Government of Japan
	GOP	Government of the Philippines
	GRDP	Gross Regional Domestic Product
	GSIS	Government Service Insurance System
	GSP	Government Support Price
	GVA	Gross Value Added
(H)	HO	Head Office
(I)	IA	Irrigators' Association
	I/A	Implementing Arrangement
	IACC	Inter-Agency Coordination Committee
	IBRD	International Bank for Reconstruction and Development (WB)
	ICC	Investment Coordination Committee
	IDD	Institutional Development Department
	IDO	Irrigation Development Officer
	IEE	Initial Environmental Examination
	IFR	Irrigation Fee Register
	IRA	Internal Revenue Allotment
	IMO	Irrigation Management Office
	IMT	Irrigation Management Transfer
	IOSP	Irrigation Operations Support Project (WB)
	IRR	Internal Rate of Return
	IRRI	International Rice Research Institute
	IS	Irrigation Superintendent
	ISAP	Irrigation Superintendents Association of the Philippines
	ISF	Irrigation Service Fee
	ISIP	Irrigation Systems Improvement Project (ADB)
	ISO	Irrigation System Office (same with NISO: National Irrigation System Office)
	ITF	Internal Task Force

(J)	JBIC	Japan Bank for International Cooperation (Ex-OECF & EXIM)
	JICA	Japan International Cooperation Agency
	JSM	Joint System Management
(K)	KGA	Key Grain Area
	KPA	Key Production Area
	KRAs	Key Result Areas
(L)	LADP-IC	Lower Agusan Development Project - Irrigation Component
	LBIFC	List of Billed Irrigation Fee Collectible
	LBP	Land Bank of the Philippines
	LDC	Livestock Development Council
	LGC	Local Government Code
	LGU	Local Government Unit
	LIPA	List of Irrigated and Planted Area
	LLP	Low-lift Pump Irrigation
	LLTCF	List of Lots with Total Crop Failure
	LWUA	Local Water Utilities Administration
(M)	MC	Memorandum Circular
	MIS	Management Information System
	M/M	Minutes of Meeting
	MOOE	Maintenance and Other Operating Expenses
	MRIIS/MARIIS	Magat River Integrated Irrigation Systems
	MSD	Management Services Department
	MTADP	Medium-Term Agricultural Development Plan
	MTP	Management turnover Program
	MTPDP	Medium-Term Philippine Development Plan
(N)	NAAD	Network of Areas for Agricultural and Agro-Industrial Development
	NABCOR	National Agribusiness Corporation
	NAFC	National Agricultural and Fishery Council
	NAMRIA	National Mapping and Resource Information Authority
	NAPHIRE/BPRE	National Post Harvest Institute for Research and Extension
	NAPOCOR	National Power Corporation (or NPC)
	NASPIE	National Association of Provincial Irrigation Engineers
	NCIA	National Confederation of Irrigators' Associations
	NDA	National Dairy Authority
	NEDA	National Economic and Development Authority
	NFA	National Food Authority (placed under the Office of the President in July 1998)
	NGC	National Government Center

	NGO	Non-Government Organization
	NIA	National Irrigation Administration
	NIAADM	NIA Association of Department Managers, Inc.
	NIAEAP	NIA Employees Association of the Philippines
	NIS	National Irrigation System
	NISO (or ISO)	National Irrigation System Office
	NMIC	National Meat Inspection Council
	NNC	National Nutrition Council
	NPAAAD	Network of Protected Areas for Agricultural and Agro-industrial Development
	NPC	National Power Corporation（or NAPOCOR）
	NSCB	National Statistical Coordination Board
	NSF	National Stud Farm
	NSIC	National Seed Industry Council
	NSO	National Statistics Office
	NTA	National Tobacco Administration
	NWRB	National Water Resources Board
	NWMIS	National Watershed Management Information System
(O)	ODA	Official Development Assistance
	OECF	Overseas Economic Cooperation Fund (Japan – Present JBIC)
	O&M or O/M	Operation and Maintenance
	OPEC	Organization of Petroleum Exporting Countries
(P)	PAIS	Public Affairs and Information Staff
	PAP	Participatory Approach Program
	PBAC	Prequalification, Bids and Awards Committee
	PBME	Project Benefit Monitoring and Evaluation
	PCA	Philippine Coconut Authority
	PCC	Philippine Carabao Center
	PCIC	Philippine Crop Insurance Corporation
	PCM	Project Cycle Management
	PD	Presidential Decree
	PDD	Project Development Department
	PDI	Project Development and Implementation
	PFDA	Philippine Fishery Development Authority
	PHILRICE	Philippine Rice Research Center
	PIM	Participatory Irrigation Management
	PIMO	Provincial Irrigation Management Office
	PIO	Provincial Irrigation Office

	PIS	Pump or Private Irrigation System
	PMO	Project Management Office
	PPRD	Procurement & Physical Resources Department
	PRA	Participatory Rural Appraisal
	PRMD	Personnel and Records Management Department
(Q)	QUEDANCOR	Quedan Corporation
(R)	RA	Republic Act
	RC	Responsibility Center
	RDC	Regional Development Council
	RIO	Regional Irrigation Office
	RIS	River Irrigation System
	ROW	Right of Way
	RRA	Rapid Rural Appraisal
(S)	SA	Service Area
	SAFDZ	Strategic Agriculture and Fisheries Development Zones
	SEAFDEC	Southeast Asia Fisheries Development Center
	SEC	Securities and Exchange Commission
	SPISP	Southern Philippines Irrigation Sector Project
	SMD	Systems Management Department
	SMNIS	Shared Management of National Irrigation System
	SOEM	Systems Operation and Equipment Management
	SPO	Special Project Office
	SRA	Sugar Regulatory Administration
	SRIP	Small Reservoir Irrigation Project
	SSL	Salary Standardization Law (RA No.6758)
	STW	Shallow Tubewell Irrigation
	SW	Scope of Works
(T)	TA	Technical Assistance
	TD	Treasury Department
	TESDA	Technical Education and Skills Development Authority
	TGISRP	Tarlac Groundwater Irrigation Systems Reactivation Project
	TLRC	Technology and Livelihood Resource Center
	TOR	Terms of Reference
(U)	UPRIIS	Upper Pampanga River Integrated Irrigation Systems
	USAID	United States Agency for International Development
(W)	WB	World Bank (IBRD)
	WTO	World Trade Organization
	WRDP	Water Resources Development Project (WB)

WRF	Water Resources Facility
WRFT	Water Resources Facility Technician

MEASUREMENTS

Length

mm	=	millimeter
cm	=	centimeter
m	=	meter
km	=	kilometer

Area

m^2	=	square meter
ha	=	hectare = 0.01 km^2 = 2.5 ac
km^2	=	square kilometer

Volume

cm^3	=	cubic centimeter
l	=	liter
kl	=	kiloliter
m^3	=	cubic meter
MCM	=	million cubic meter
cavan	=	50kg

Derived Measures

m/s	=	meter per second
m^3 /s	=	cubic meter per second
kWh	=	kilowatt hour
MWh	=	megawatt hour
LPS	=	liters per second

Weight

g	=	gram
kg	=	kilogram
MT	=	metric ton = 1,000 kg

Currency

PHP	=	Philippine Peso
JPY	=	Japanese Yen
US$	=	US Dollar

Time

sec	=	second
min	=	minute
hr	=	hour
d	=	day
y or yr	=	year

Other Measure

%	=	percent
^{o}	=	degree
^{o} C	=	degree(s) Celsius
10^3	=	thousand
10^6	=	million
10^9	=	billion

Energy

W	=	Watt
kW	=	kilowatt

Fiscal Year

January 1 to December 31

Exchange Rates

(as of August 2001)

US$ 1 = PHP51

US$ 1 = JPY122

APPENDIX I

CAPACITY IMPROVEMENT PLAN FOR NISO

APPENDIX – CHAPTER I

CAPACITY IMPROVEMENT PLAN FOR NISO

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I CAPACITY IMPROVEMENT PLAN FOR NISO

1. Objectives of the Capacity Improvement Plan

The capacity improvement plan was primarily directed at improving the financial viability of the systems' offices. The viability can be enhanced through the introduction of improved O&M practices designed to increase efficiency and effectiveness of the irrigation systems. To get immediate results, two areas of concern were selected, notably water management and ISF collection. These concerns constituted the action plan where trials were conducted in selected offices.

In parallel, organizational plan was also formulated to address new policies such as IMT, devolution and decentralization of activities from the CO to the field offices.

2. Methodology

2.1 NISO as a Case Study for Capacity Improvement

The NISO has been chosen as the case study for three (3) reasons. First, it is the main organization directly responsible for managing the national irrigation systems. There are about 197 national irrigation systems directly under the supervision of 107 NISOs, unlike the communal irrigation systems that are already devolved to the LGUs[1]. Second, although there are communal irrigation systems, local as well as foreign-funded, maintained by the PIOs, it is likely that this arrangement will eventually be devolved to the LGUs by virtue of the AFMA. Third, the NISO is a self-liquidating organization whose main source of revenue is collection of ISF. Higher collection of ISF is now crucial in sustaining the viability of the NISO. There are also NISOs that lend their heavy equipment for a fee, and earnings from this augment their revenues. Thus, from an organizational point of view, it deems more essential to address the critical problems affecting the NISO than PIO as the former is likely to be retained within the organic ambit of NIA.

2.2 Performance Evaluation of NISO

(1) Evaluation Criteria

A total of 105 NISOs nationwide were evaluated and classified according to four (4) principal indicators, namely: cropping intensity, collection efficiency, income-expense ratio and yield per hectare. These indicators were used because of readiness and availability; applicability and relevance; and relative ease in interpreting the substantive and quantifiable information. It is to be noted that cropping intensity and yield per hectare are directly influenced by the performance of the irrigation systems coupled with agronomic and climatic considerations. Collection efficiency and income-expense ratio are contingent on the absorptive capacity of the ISO. Combining these four (4) indicators would thus be sufficient to evaluate the performance of the NISOs.

[1] Although there are 107 NISOs, only 105 are considered operational.

(a) Scoring System

To be able to compare the performance of 105 NISOs, a scoring system using the above-named indicators was adopted as presented below:

Indicators	Scoring Range	
	Minimum	Maximum
1. Cropping intensity	5	25
2. Collection efficiency	5	25
3. Income-expense ratio	5	25
4. Yield/ha	5	25
Total Score	20	100

As the score ranges from 5 to 25, the corresponding rating for each score was also developed to permit objectivity as shown below:

Rating	Score
Very Poor	5
Poor	10
Average	15
Good	20
Very Good	25

(b) Decision Criteria

Decision criteria were established for each indicator to be able to assign the corresponding score as shown below. The individual criterion was constructed based on the absolute values of the computed indicators. For purposes of this exercise, the average of the 1995-1999 data of the Systems Management Department (SMD) was used. It should be noted, however, that the 1998 data was excluded in the calculation of the average values, as it was an abnormal year, where the effect of the El Nino phenomenon strongly affected irrigation and crop management practices.

Decision Criteria	Points
1. Cropping intensity	
a. <100%	5
b. 101-125%	10
c. 126-150%	15
d. 151-175%	20
e. >176%	25
2. Collection efficiency	
a. <25%	5
b. 26-40%	10
c. 41-55%	15
d. 56-70%	20
e. >71%	25
3. Income-expense ratio	
a. <0.85	5
b. 0.86-1.00	10
c. 1.01-1.20	15
d. 1.21-1.50	20
e. >1.51	25
4. Yield/ha	
a. <2.00 tons	5
b. 2.1-3.0	10
c. 3.1-3.8	15
d. 3.9-4.5	20
e. >4.6	25

(2) Results of Evaluation

For each NISO, the minimum total score would be 20 while the maximum would be 100. Twenty was the minimum total score because the lowest point that can be assigned for each indicator was 5 regardless of whether or not the data was missing. This system was used to minimize subjective evaluation. The NISOs can be classified according to their total scores as follows:

Rating	Score
Poor (Class C)	20-45
Average/Fair (Class B)	50-65
Good (Class A)	70-95

Table I.1 shows the summary of the evaluation, while Table I.2 presents the individual scores and rating of the 105 NISOs. In general, about 20 percent or 24 were ”good”; 50 percent or 53 were “average/fair”; and 30 percent or 28 were “poor”. The good NISOs had a service area of about 171,000 hectares, while the average and poor NISOs had roughly 355,000 and 134,00 hectares, respectively. The proportion of poor NISOs, considered important in relation to their service area, necessitates an urgent need for institutional and technical improvement. The service area of these NISOs, measuring about 20 percent of the total service area, are expected to enhance land productivity and irrigation efficiency should these offices be improved and elevated to the level of good NISOs.

Among the three- (3) island group, the Mindanao region had relatively the best-managed NISOs. It had the least number of poor NISOs. The Mindanao region, accordingly, has had

the best performing NISOs due to strong IAs, efficient and better irrigation systems and favorable climate. Luzon was next with 12 good and 30 average NISOs, while the Visayas region had two (2) good and 8 average NISOs. In terms of poor NISOs, however, Luzon had the most number (72 percent) among the three- (3) island regions.

Luzon, however, had the most extensive service area for all classes. This is primarily due to the greater number of irrigation projects being constructed coupled with the large and combined service area of the MRISS and UPRIIS of about 191,000 hectares located in regions 2 and 3. The service area of the Mindanao region for all classes is barely one-third of the total service area of Luzon. Given the magnitude of the current service area and absorptive capacity of the NISOs among the three- (3) island regions, the acceleration of capability improvement is deemed warranted in Luzon and Visayas.

(3) Selection of Model and Replication Offices

A model NISO was selected from the Class offices. There are about 21 Class A offices located mostly in Luzon and Mindanao. Apart from the individual scores garnered by these offices, accessibility and peace and order condition were given premium considerations. Between these two island regions, the latter was thus ruled out for obvious reason. The selection was then limited to Regions III and IV in Luzon.

Replication NISOs were selected from Classes B and C offices, one from each class. Similar to the selection of the model NISO, accessibility and peace and order conditions were also given due considerations. In addition, the site for the GIS scaled at 1:4000 was also considered to permit efficient application of the GIS. The replication sites were then selected from Luzon and Visayas.

Among the 105 NISOs, the following were chosen in due consideration of the above and through discussion with the NIA counterpart staff.

Name of NISO	Type	Class
1. Nayom-Bayto	Model	A
2. UPRIIS District III	Replication	B
3. Aganan-Sta. Barbara	Replication	C

(a) Nayom-Bayto

Nayom-Bayto is located in Zambales, Region 3. The evaluation score was 75 and was selected from 21 candidates. The main consideration was the nearness to Metro Manila and stable peace and order condition. It should also be stressed that the management of Nayom-Bayto ISO can be considered exceptionally good one given the highest concentration of ISOs in Luzon vis-à-vis Mindanao and Visayas.

(b) UPRIIS District III

UPRIIS, District III is located in Cabanatuan City, Region 3. The evaluation score was 50 and was selected for Class B primarily due to its proximity to Metro Manila and the fact that this site was also chosen for the GIS study scaled at 1:4000. The selection of

UPRIIS District III is also indicative for a typical large-scale system whose service area is about 30,000 hectares.

(c) Aganan-Sta. Barbara

Aganan-Sta. Barbara is located in Iloilo, Region 6. The evaluation score was 45 and was selected for class C due to its applicability to the adjacent areas. The NISO also suffers from low collection of ISF and its main and lateral canals are poorly maintained.

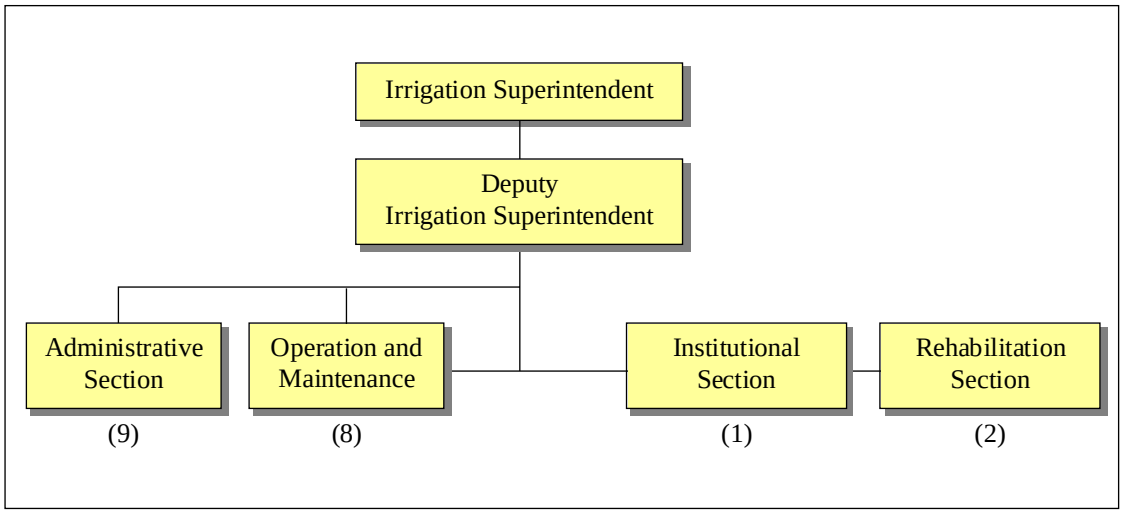
2.3 Review of Model and Replication Offices

(1) Review of Organizational Structure

(a) Nayom-Bayto

The NISO is responsible for the management of two (2) national irrigation systems, Nayom and Bayto whose total service area is about 1,950 hectares. It is representative for the management of small irrigation system. Organizationally, it is structured into four (4) sections directly under the irrigation superintendent as shown in the following figure.

Organizational Structure of NAYOM-BAYTO



The administrative section, composed of 9 staff, handles personnel and financial matters, including billing of ISF, while O & M section is mainly responsible for water management. The O & M section, is headed by an engineer and support staff are mainly WRFTs, composed of two (2) ditchtenders, two (2) gatekeepers and three (3) technicians. The institutional section is manned by a single IDO. This section was established through the initiative of the irrigation superintendent to continue overseeing the development of the IAs. Nayom-Bayto is not eligible for an IDO position since the IAs have already been organized. It is NIA's policy that position for IDO is co-terminus with the full organization of the IAs. The initiative taken by the irrigation superintendent can be considered proper given the long gestation period of nurturing the absorptive capacity of the IAs. The rehabilitation section is composed of two (2) engineers whose main task is repairs and maintenance.

There are 21 staff, 50 per cent of whom are skilled or technical people in irrigation management. The current staffing represents 80 percent of the approved positions, an indication that it is not greatly affected by the retrenchment policy of NIA. This translates to a manpower output ratio of 90 hectares per staff, adequate to cover the operations of the two- (2) irrigation systems. Manpower allocation is generally focused on the administrative and O & M sections. The distribution of personnel is oftentimes temporary given the flexible type of management being adopted by the irrigation superintendent. The staff are being mobilized to render extra effort, without additional compensation, to do collection of ISF and foot patrol (group of 3 staff) during night time to enforce water delivery schedule. This makes the NISO efficient in the collection of ISF and enforcement of water management practices, especially rotational irrigation during dry season.

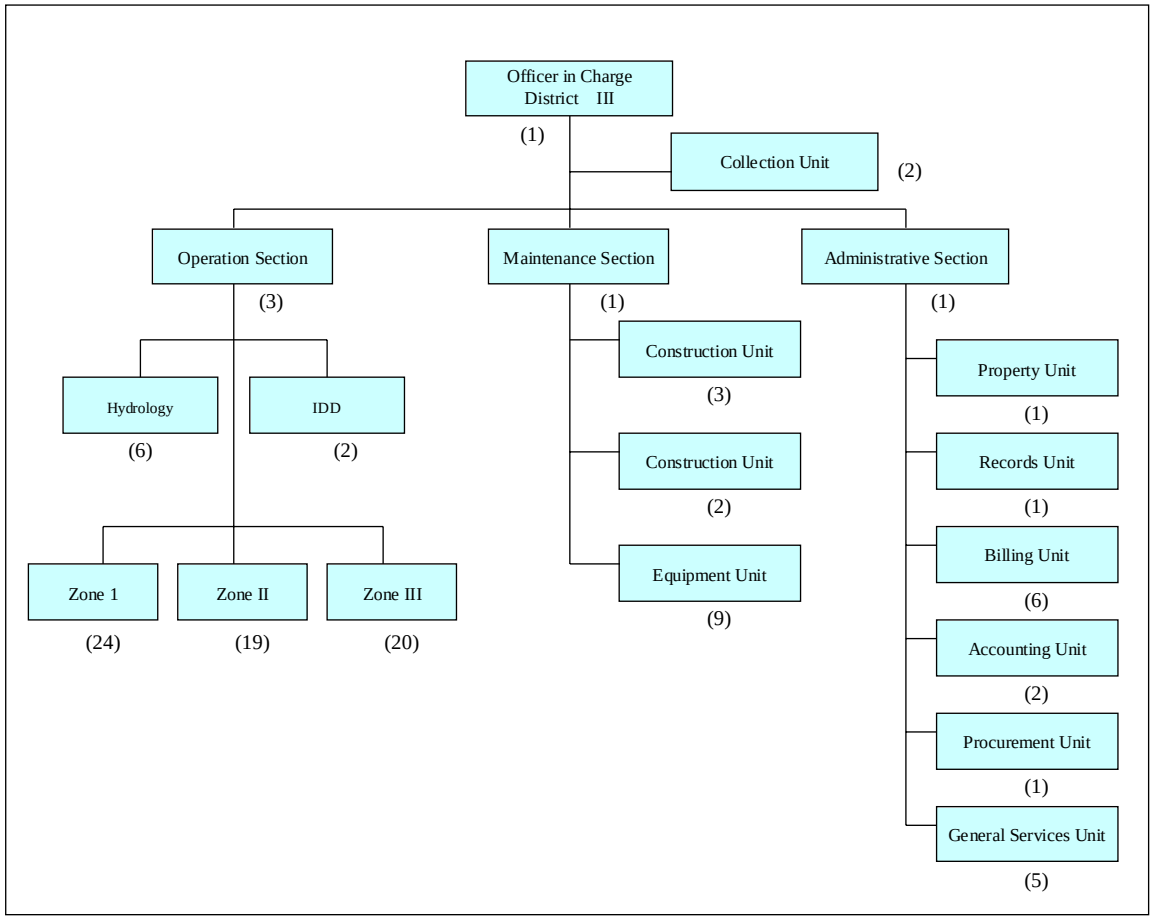
The present organization is managed by a dynamic irrigation superintendent who can relate very well not only with his staff but also with members of the community, especially the IAs and the LGUs. The office has existing Type I and II contracts for all of the IAs, the longest contracts are due to terminate by 2006. The present leadership who has been in the office since 1987 has always maintained good performance. It should also be noted that the conditions of the physical irrigation facilities are rather good. Leadership, strong support of the stakeholders, and well-maintained physical facilities can be considered the essential factors for good performance of the office.

Notwithstanding the good performance of the office, there are perceived structural defects of the organization. First is the absence of a deputy who can equally manage the office in case the present leadership is indisposed. Although there is an internal arrangement that any of the heads of the administrative and O & M sections can assume the post, this is not formally established. Second, is the perceived overlap between the O & M and the rehabilitation sections given the seasonal nature of activities of the latter section. Third, billing and collection of ISF has become a multi-tasked activity among everyone in the organization to the extent that other equally important activities are neglected. The assignment of only a single staff on a temporary status in the institutional development section is a case in point.

(b) UPRIIS District III

District III is one of the four (4) NISOs under the Upper Pampanga River Irrigation Systems covering a service area of about 30,000 hectares. The office, typical for the management of large irrigation system, is composed of three (3) sections: operations, maintenance and administrative as shown in the following figure.

Organizational Structure of UPRIIS



There are 109 personnel 70 per cent of whom are assigned to the operation section. The balance of 30 percent is assigned to the administrative and maintenance sections whose total personnel number 17 and 15, respectively. The collection unit has about 2 personnel. The current workforce is 40 percent of the approved positions, an indication of manpower depletion. The manpower output ratio is about 275 hectares per staff. The manpower output ratio is further diluted when it is related directly to operations, estimated at 405 hectares per staff. This implies that there is simply heavy workload for every personnel assigned in the operations. In addition, there is the usual task of collection of ISF which has compromised performance of the section.

The organizational problems in District III are rather complex. Aside from the depleted manpower, there are functional flaws. First, the operation section appears to be pre-occupied with irrigation engineering. Institutional development is superficially recognized. A unit under operation section, composed of only two (2) IDOs, can hardly do follow through activities of 115 IAs of 18,500 members. In addition, there is nothing on agriculture in the operation section that could possibly take care of sustainable farming. Second, the maintenance section appears to have diminished its importance because of overemphasis on rehabilitation vis-à-vis routine and preventive maintenance. Third, billing and collection of ISF given premium consideration vis-a-vis other activities, is rather misplaced. If there is a serious desire to improve collection efficiency, it should be a separate section manned with competent staff. Fourth, is absence of a deputy who can assist the irrigation superintendent in the day-to-day operation given the sheer size of the irrigation systems. It is surprising to find out in District III of the

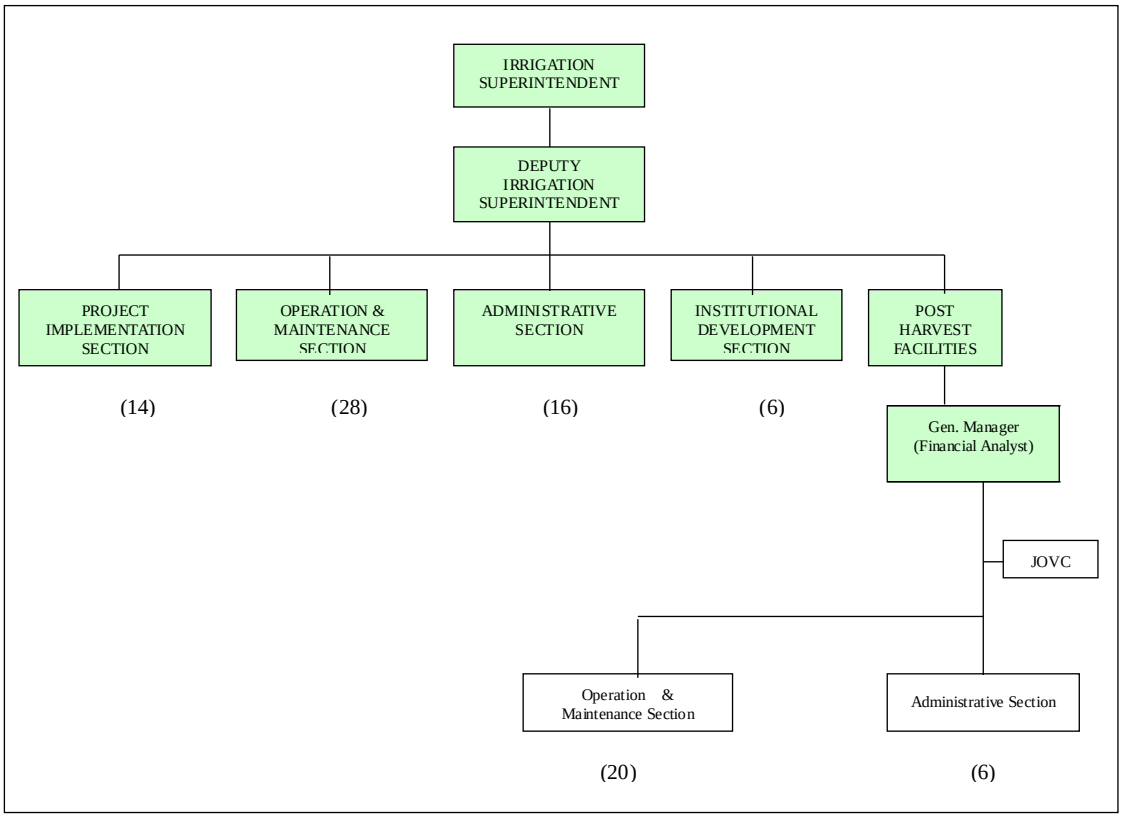
absence of a deputy whereas smaller to medium NISOs have assistant. Fifth, is the presence of WRFTs who have maintained their posts as ditchtenders (about 26) and who have not upgraded their skills to assume more important roles. This has prevented the office to accelerate the awarding of Type I contract to the IAs. Only 50 IAs have Type I contract which could probably explain for the poor commitment of IAs to maintain the lateral and secondary canals.

Addressing the organizational problems alone may not be sufficient to improve performance of the office, however. The physical facilities of the systems that have badly deteriorated should be equally remedied. Attempts to restore efficient operations in the office may thus require broader and longer-term perspective, particularly in the area of irrigation water management and maintenance.

(c) Aganan-Sta. Barbara.

Aganan-Sta. Barbara NISO is responsible for the operations of two (2) river irrigation systems comprising a service area of 8,200 hectares. The office, typical for the management of medium-size irrigation system, is composed of four (4) sections as shown in the following figure.

Organization Structure of AGANAN-STA. BARBARA



A fifth section, although informally established by virtue of the JICA-assisted post-harvest complex, is the post-harvest facilities section. It is a semi-autonomous section as it operates to be self-liquidating unit, and also planned for complete turnover to the IAs once it has become a viable entity. A deputy directly assists the irrigation superintendent.

There are 66 permanent staff and supported by about 46 daily staff. The manpower output relative to permanent staff only is estimated at 120 hectares per staff. Should the daily staff be included, the manpower output is estimated at 70 hectares per staff. It appears that the NISO is overstaffed relative to its service area compared with Nayom-Bayto and UPRIIS District III.

Organizationally, the sections being established are reasonable, except for the misplacement of project implementation. Operation and maintenance, administrative and institutional development sections are formally created essential for proper management. O & M is headed by an engineer and supported by 26 WRFTs and one (1) agriculturist. On paper, the staffing is ideal for at least a balanced emphasis on water management and agriculture. The administrative responsible for financial and personnel, including billing of ISF is headed by a cashier and supported by 15 personnel composed of clerks, drivers, guards and other utility workers. The institutional development directly responsible for overseeing the enhancement skills of the IAs is composed of two (2) IDOs and one (1) utility worker. Project implementation is staffed by two (2) engineers, and assisted by 12 skilled workers. The composition of its personnel would indicate that it is responsible for major repairs and maintenance rather than execution of projects. Project implementation can be fused with O & M section.

There are rooms for further changes to make the office perform better. First is the elimination of redundant and misplaced personnel. There are many daily personnel (40 per cent of total workforce) and minimizing them will certainly reduce the operating cost. Second, the project implementation section needs to concentrate on maintenance of the facilities given the deplorable conditions of main canals. Low morale among personnel presumably aggravates the non-attention to maintenance work. In due time, project implementation should be integrated with O & M section for better coordination. Third, billing and collection of ISF should be given more teeth and this augurs well for creating a separate billing and collection section.

(2) Review of Water Management and Maintenance

(a) Nayom-Bayto

Nayom-Bayto follows a two-cropping season. The wet season begins in June and ends in October and the dry season starts in November and ends in March. Third cropping is done, although on a small area in Nayom of about 250 hectares.

Water management practices usually starts with calculation of available water supply and matched with projected demand. The O & M section regularly prepares and update such information as cropping calendar and water delivery & distribution schedule based on hydrological (river discharge) and rainfall data collected daily by the water masters. These pieces of information serve as the basis for preparing the seasonal plan detailing the volume of water delivery per lateral. One (1) month before the start of the planting, the irrigation superintendent discusses the water delivery schedule, aided by an updated parcellary map, prepared by the O & M section together with the leaders of the 13 IAs. The water delivery schedule is then presented to the IAs for necessary coordination. Nayom-Bayto regularly updates its water delivery schedule.

Rotational irrigation is practiced during the dry season while continuous irrigation is practiced during the wet season. Sometimes rotational method is being resorted to during

wet season. The rotational system of irrigation is the key to the high cropping intensity achieved by the office, estimated at an average of 165 percent during 1995-1999. It is to be emphasized that the key to the successful implementation of rotational method of irrigation is its strict enforcement. The office conducts foot patrol in the evening (group of 3 staff) from 7:00 PM to 4:00 AM. The basis for water distribution is per lateral with each lateral having a service area of about 200 hectares. Each lateral can get water for about 24 to 48 hours in a week and wait until the succeeding week for the next water delivery. The water management practice is efficient due to combination of technical and institutional factors. For one, the main and some lateral canals are concrete lined; hence it would be difficult to make unauthorized water diversion. Second, the 13 IAs are disciplined and give their full cooperation to the extent that they themselves do the water rationing within their respective laterals. This is rather exceptional, given that only 60 percent of the beneficiaries are members of the IAs.

Operation and maintenance is practically flawless. River sedimentation is virtually nothing. Main and lateral canals are clean. Access roads are well maintained. The water masters and gatekeepers do greasing of gates once every cropping season. All of the 13 IAs do the clearing and cutting of grasses in the main and lateral canals under Type I contract. The IAs are being paid 200 pesos/km for concrete lined canal and 400 pesos/km for earth canal. The IAs are supposed to clean monthly, but this has been reduced to once every two-(2) months because of budgetary constraint. Payment for canal maintenance is evaluated through inspection jointly conducted by the water master, IDO and irrigation superintendent.

Inspection for routine maintenance is done through walk-through by the head of the rehabilitation section (visit of once to two times per week) and feedback from the As. Rehabilitation work, i.e. during calamity, is rather getting harder as this is a contingent on the availability of funds. The office does group work and temporary repairs using their common fund (Fund 101) during such situation because of surplus fund.

Facilities that need to be repaired are the modification of turnouts and farm ditches. There is a need to consolidate the turnouts to prevent excessive flow of unnecessary water due to higher elevation of rice paddy vis-à-vis laterals. The farm ditches, although not a responsibility of the NIA, have to be modified to prevent water losses, seepage and water obstruction.

In summary, the good practices that maybe worth replicating are:
the practice of good planning of water delivery schedule as a basis for a sound irrigation plan;

1) the practice of rotational irrigation with strict enforcement during critical water supply and;

2) the practice of providing regular maintenance for the major facilities, especially main and lateral canals.

The conditions precedent to the above practices should, however, be considered. These include manageable service area, good irrigation facilities, and strong monitoring support not only from the IAs but also from the community. These factors are considered evident in the successful implementation of good water management in Nayom-Bayto.

(b) UPRIIS District III

District III follows two (2) distinct cropping patterns. The wet season begins in June and ends in November, while the dry season starts in December and ends in April. It is almost similar to Nayom-Bayto.

Physical, technical/design and institutional limitations affect water management. During wet season water supply is dependent on water coming from the Pantabangan reservoir (70 per cent) and from the catchment area of Pampanga-Bongabon diversion (30 per cent) dams. In the dry season, the water supply is being reversed, with greater supply coming from the diversion and lesser supply from the dam. It is planned for a service area of 28,000 to 30,000 hectares. During wet season, however, only 23,000 to 24,000 hectares can be planted due to severe drainage problem in the downstream area. In the dry season, water becomes critical and only 22,000 hectares can be irrigated.

Water management planning is completely devoid of any scientific rule because water management parameters have become unreliable. For one, the operation section does no longer keep hydrological data except those released by the UPRIIS main office. It is also impossible to keep the hydrological data as gauges and measuring instruments installed at major canals and intakes have become non- functional. Neither the operation section has instruments to collect water management parameters. It can be argued that the determination of available water and water delivery schedule has become arbitrary. This is evident by the fact that the operation section does not have water delivery schedule unlike in Nayom-Bayto.

The starting point for water allocation (especially dry season) emanates from the engineering operation division of UPRIIS' main office where the total available water supply from the reservoir dam is divided among the four- (4) districts based on certain ratios. Together with the water coming from the catchment area of the diversion dam, the total available water to be delivered would be divided among the three- (3) zones through the respective zone supervisors. The zone supervisors would in turn determine the area to be irrigated. Ideally, it would have been better if the water allocation is based on the 17 divisions where a division is about 1,000 hectares. The operation relies heavily on the report of the zone supervisors about area to be irrigated. At the moment, emphasis on water management is on a need basis. Water delivery schedule has even become useless because irrigation water anyway is continuous. At the upstream area, large pumps are being installed to irrigate higher elevated areas (outside of service area) without any levy.

Operation and maintenance of the system has been greatly affected by the absence of major repairs for the past 16 years. Main structures of the dam are tolerable, but canals, access roads, turnouts and farm ditches are not maintained properly. For lateral canals supposedly under Type I contract, only 50 out of the 115 IAs have existing contract. The IAs are being paid 400 pesos per km of canal being cleared. The main reason for non-awarding of Type I contract to most IAs is reportedly the presence of many WRFs (e.g. ditchtenders) who could still do the clearing and cutting of grasses. The few Type I contract being awarded is due to: (a) reluctance of IAs to accept the responsibility either because of low payment and/or the canals are simply beyond clearing; and (b) deliberate delay to award Type I contract to maintain employment security of the ditchtenders. The latter is understandable given employment instability among NISO staff. In the interest of promoting the ownership of facilities among the IAs, however, such perspective is

considered narrow. The ditchtenders could be re-oriented to assume greater role and responsibilities beyond clearing of canal given that the over-all manpower is badly depleted.

In the same view, there is generally an apparent apathy of the IAs towards commitment to maintain and clean canals due to non-preparedness. They do not seem to appreciate the value of maintaining good facilities that could be the result of poor supervision. It should be noted that only two (2) IDOs supervise the 115 IAs of about 18,500 members. It is beyond imagination how two (2) IDOs can properly coach and train the IAs not to mention the lack of cash to continue the IAs' developmental training.

The water management and maintenance concerns are the subject of an on-going study on irrigation management transfer (IMT) of about 4,000 hectares under the Casecnan Irrigation Project. Notwithstanding the on-going IMT experiment, the following observations are important:

1) rehabilitation and repairs of major facilities should precede any form of capacity improvement on water management and maintenance concerns;

2) strengthening the skills of the IAs should simultaneously commence with the physical development; and

3) given the complex environment in UPRIIS, the support of the LGUs is critical to realization of any capacity improvement.

(c) Aganan-Sta. Barbara

Aganan-Sta. Barbara follows a two-cropping pattern. The wet season begins in May and ends in September. The dry season commences in October and ends in February. The irrigation superintendent and the O & M staff prepare the cropping calendar based on probable water supply and rainfall. This aspect is usually the beginning of the water management plan.

For both systems, rotation irrigation is practiced. Aganan implements a 7 to 8-day water delivery schedule for each area of 15 to16-day interval before the second cycle begins. In the case of Sta. Barbara, a 3 to 4-day water delivery schedule of 11 to 12-day interval is being done before the succeeding phase begins. It is to be noted that in both systems, rotation irrigation is being practiced regardless of water availability. Despite rotation, farmers do not strictly follow the schedule due to insufficient water supply. It is believed that the enforcement is superficial, unlike in Nayom-Bayto where it is strictly implemented. Partly to be blamed accordingly is the inaccurate estimation of water supply brought about by the absence of measuring devices and severe siltation along the main canals. It has been reported that no hydrological records are being maintained at the moment, hence it is virtually difficult to implement an effective water management of the systems. In short, the planning capability of the office ought to be addressed so as to correct information about water supply.

Maintenance of gates and structures is done by the WRFs. The IAs, under Type I contract, and WRFs (ditchtenders) jointly clean the main and lateral canals. Desilting and rehabilitation works are done through funding support mainly from the IOSP. It is observed that there is no regular cleaning and maintenance work for the main and lateral

canals. This clearly points out the lack of coordination and motivation exacerbated presumably by the untimely release of payment to the IAs and salaries to the staff.

Equipment are being used to desilt the main canals. Since the office does not have a pool of heavy equipment, it is the regional office that does this activity. The regional office, however, puts low priority for desilting as equipment are being rented out to projects to generate revenues to support the operations of the region. Under this circumstance, there is no way the canal and road network of the system can be maintained properly.

(3) Review of Financial Performance and ISF Collection

(a) Comparative Financial Performance

A comparative analysis of the Model Office (Nayom-Bayto NISO) and the Replication Offices (UPRIIS District III and Aganan-Sta. Barbara NISO) is presented in the following table.

The analysis covers a five-year period, three years prior to AO 17 and two years during and after the implementation of AO 17.

Comparative Analysis on Financial Performance (1995–1999 average)

Year	Viability Index	Collection Eff.	Billing Eff.	Cropping Intensity
1995				
Nayom-Bayto	115%	66%	95%	157%
UPRIIS - District III	84%	48%	71%	141%
Aganan-Sta. Bar'bra	92%	38%	67%	124%
1996				
Nayom-Bayto	104%	75%	98%	164%
UPRIIS - District III	85%	41%	61%	122%
Aganan-Sta. Bar'bra	91%	40%	71%	128%
1997				
Nayom-Bayto	119%	67%	97%	163%
UPRIIS - District III	95%	44%	57%	113%
Aganan-Sta. Bar'bra	76%	32%	75%	132%
1998				
Nayom-Bayto	112%	45%	92%	155%
UPRIIS - District III	47%	33%	44%	106%
Aganan-Sta. Bar'bra	52%	28%	66%	62%
1999				
Nayom-Bayto	105%	55%	96%	166%
UPRIIS - District III	100%	24%	69%	137%
Aganan-Sta. Bar'bra	70%	25%	73%	125%
Average				
Nayom-Bayto	111%	62%	96%	161%
UPRIIS - District III	82%	38%	60%	124%
Aganan-Sta. Bar'bra	76%	32%	70%	114%

Source: JICA Study Team

Nayom-Bayto consistently exceeded the viability threshold index of 1 with an average of 111.0%, in contrast with its counterparts, UPRIIS District III and Aganan-Sta. Barbara with an average viability index of 82% and 76%, respectively.

The ability of the Model Office to sustain a viable operation was due to a higher collection efficiency of 62% compared to District III with 38% and Aganan-Sta. Barbara at 32%. The national average was 39.6%

The collection efficiency of the Model Office was attributed to the (1) 96% billing efficiency (increase in billed areas) compared to the other offices with only 60% and 70% for District III and Aganan-Sta. Barbara, respectively.

The cropping intensity also pushed up collection as it increased farmers' willingness and capacity to pay due to increased yield per hectare.

(b) Financial Performance in 1999

Financial performance of the model office and replication offices in 1999 is presented in the following table.

Comparative Income and Expense Statement
Model and Replication Offices – 1999

(Unit: PHP)

Gross Income			
Irrigation Service Fee	1,490,256	11,128,266	2,550,377
Equipment Rental	687,062	5,027,292	662,568
Other Income	3,911	3,223,149	73,957
Total Income	2,181,229	19,378,707	3,286,902
Less: Expenses			
COB Expenses	2,085,320	19,361,218	4,705,202
Total Expenses	2,085,320	19,361,218	4,705,202
Net Income (Deficit)	95,909	17,489	-1,418,300
a. Service Area (has.)	1,950	31,000	8,500
b. ISF Per Hectare (Php/ha)	764	359	300
c. Other Income Per/Hectare	354	266	87
d. Income Per Hectare (Php/ha)	1,119	625.12	387
e. Cost Per Hectare (Php/ha)	1,069	624.56	554

Source: JICA Study Team

On a per hectare basis, Nayom-Bayto earned Php 1,119/hectare compared to UPRIIS District III with a figure of Php 625/ha and Aganan-Sta.Barbara with Php 387/ha. Among the three offices, ratios of equipment rental income are rather high in Nayom-Bayto (31% of total income) and UPRIIS District III (26%), than in Aganan (20%).

(c) ISF Collection

The forms and documents to be prepared for ISF billing and collections are explained and summarized below:

1) List of Irrigated and Planted Area (LIPA)
It contains the list of lots with irrigated and planted area. Input for this form comes from WRFT based on field inspection. This is the source for the BSA.

2) Bill and Statement of Account (BSA)
This is the billing statement sent to the irrigation users where the user's current and past due accounts are indicated.

3) List of Lots with Total Crop Failure (LLTCF)
Contains the list of farm lots with crop failure. This is one of the two documents that adjusts/corrects/cancels the BSA. Input comes from the WRFT.

4) Amendments to List of Lots Planted
Contains the list of lots that needs adjustments/corrections. This is the second documents that adjusts/corrects/cancels the BSA. Input comes from the WRFT.

5) List of Billed Irrigation Fee Collectibles
This contains the final list of BSAs prepared and issued to the farmer users. This is the source document for the booking of ISF receivable in the regional office. The Billing Clerk prepares this.

Comparative ISF Collection Procedure

A comparison of the activities conducted by the model office and replication offices is presented in the following table.

Comparative ISF Collection Procedure

Procedure	Model Office	Replication Offices
1. Updating of Parcellary Mapping	Drawn every year; updated; fully utilized in monitoring irrigated, benefited, billed and exempted areas. Posted. In the board.	Drawn every year; not updated; not fully utilized in monitoring irrigated, benefited, billed and exempted areas. Kept in the cabinet.
2. Physical Inventory of Farm Lots within the service area	Have full inventory of the number of farm lots and lot sizes within the service area.	No physical inventory of farm lots and farm lot sizes.
3. Firming Up of Farm Lot Sizes	Firmed up and established.	Not established. Discrepancy between IFR and LIPA exist. Causes delay in BSA preparation.
4. Updatig of Master List of Farmers-Members	Posted along with the parcellary maps. Updated every time changes occur. Used to monitor erring farmer members	Not updated,
5. Updating of Irrigation Fee Register	Updated. Number of IFR equal the number of farm lot contained in the master list and parcellary maps.	Not updated.
6. LIPA Preparation	Submitted progressively as scheduled. Billing Clerk does not complain on the way LIPA is prepared.	LIPA erroneously and poorly done; submission beyond harvest time, data on lot sizes and computed ISF rates do not tally with the IFR. BC complains on the way LIPA is prepared. LIPA not submitted progressively but lump sum
7. BSA Preparation /Distribution	Prepare and distributed on schedule (threshing period).	Very much delayed distribution even beyond threshing period.
8. Adjustment/Correction of BSA	Adequately documented using LLTCF or ALLP. Claimed exemptions verified before approval.	Not adequately implemented.
9. Safeguarding of IFR	Kept in locked cabinet.	Not kept in locked cabinet.

From the table, it can be concluded that the reason of Nayom-Bayto's high billing and collection efficiency was its ability to fully utilize the parcellary maps in monitoring irrigated, benefited, exempted, billed and collected areas. The ability to monitor these areas is also an effective deterrent in any fraudulent attempt to understate billed areas.

3. Formulated Capacity Improvement Plan

3.1 Water Management

The water management improvement plan tested dealt on (a) proper control of water delivery and distribution at the head gate and turnouts; and (b) enforcement of delivery schedule to permit the implementation of rotational irrigation during critical water supply. The improvement plan stood out as a major proposal (40% of the respondents endorsed) to

improve water management among the beneficiaries in a survey conducted in Aganan RIS as shown in Table I.3).

WRFTs, ditchtenders and selected IA members were given on-the-job training on proper gate control operation and water delivery.

Enforcement of water delivery schedule was directed to the NISO through the conduct foot patrol in the evening.

The trial was tested in Aganan-Sta. Barbara NISO during the period September 2000 – February 2001 corresponding the dry season where water supply was considered critical. A validation survey was again conducted in July 2001 to validate the perceptible impact of the improvements in gate control and water delivery introduced in the first trial.

3.2 ISF Collection

The ISF collection improvement plan involved: (a) skills enhancement (b) updating of master list and parcellary maps, (c) reconciliation of the master list with the IFRs, and (d) revision of billing procedure. The plan was designed: (a) to increase staff efficiency and productivity through the application of new technologies, notably use of computers, (b) to firm-up the service area for billing purposes, (c) to improve reporting accuracy on benefited and exempted areas, and (c) to increase the billable area as a result of the reconciliation of the master list and IFRs.

The plan was tested in UPRIIS District II and Aganan-Sta. Barbara NISOs.

4. Application to Replication Offices

(1) Job Aid for Water Allocation and Delivery

Following the work flow in Figure I.1, the Study Team, WRFTs, and representatives of the concerned IAs jointly prepared a job aid on gate operation and water-delivery schedule shown in Table I.4. The water delivery schedule was fixed on permanent bulletin boards (60 x 45 inches of plywood material), and was subsequently posted beside the head gate of laterals A, B and C.

The water delivery schedule was formulated in relation to the cropping pattern. The closing and opening of the head gate/check gate meanwhile corresponded to the water delivery schedule. The schematic layout is given in Figure I.2.

The water delivery schedule can be understood this way. During the dry season, the sequence of water rotation begins at the lower portion (Area C), followed by the upper portion (Area A) and middle portion (Area B). Area C receives water on October 1 until October 9. All of the head gates of laterals A and B are closed at 8:00 am on October 1, but the check gates are opened to allow the water flow to reach Area C. Water delivery to Area A starts on October 9. The head gate of lateral A is opened at 8:00 am on October 9 and the check gate of lateral A is closed on the same day/time until October 16. Area B receives water on October 16 at 8:00 am. To do that, the check gate of lateral A is opened on that same day while the head gate of lateral A is closed. Headgate of lateral B is opened while checkgate is closed at 8:00 am on

October 16. This is maintained until October 24. As soon as the sequence is completed, the next cycle again begins with Area C until the terminal drainage on February 28.

(2) Foot Patrol Teams

Conflict stems from the unjustified opening and/or closing of the head gate/check gate, especially in the evening. Lower portion areas are normally deprived of their regular water delivery when the head gate at the upper portion is opened during their scheduled water delivery. To ensure the success of water deliveries, foot patrol teams composed of the chief of the operations section, WRFTs of Area A, B, and C and representatives of the IAs were subsequently organized.

(3) Job Aid for ISF Billing and Collection

The flowchart in Figure I.3 was developed to serve as a guide in undertaking a series of inter-related activities described below. These activities were supervised by the Study Team and carried out by the staff of UPRIIS District II in Cabanatuan City and in ASBRIS in Aganan, Iloilo.

a. Initial Reconciliation of Master List with the Old Parcellary Maps and the IFRs

   The Master List was initially crosschecked with the available Parcellary Maps and the Irrigation Service Fee Registers (IFRs). This was done to initially establish the discrepancy, if any, between these three documents.

b. Field Verification and Confirmation

   Field verifications and confirmations were conducted after initial reconciliation of the master list and IFRs. This activity involved interviews and crosschecking of data with farmer-beneficiaries.

c. Updating of the Database (Master List)

   Based on the results of the field investigation, changes were reflected to the master list database. This database is a list of actual irrigation users, their names and addresses, sizes of their farms and lot numbers.

d. Updating of the Parcellary Maps

   Additions, deletions or changes in the master list were also reflected in the parcellary maps. The connecting link between these two documents is the NIA lot number in the case of UPRIIS, and cadastral number, for ASBRIS.

   The updated parcellary maps would be used to effectively monitor utilization of the service area using the coding system recommended in MC No.71 Series of 1991.

e. Reconciliation of Updated Master List with the IFRs.

   To ensure that every farmer-beneficiary shown in the Master List has a

corresponding IFR card, reconciliation with the IFRs was carried out.

f. Skill Enhancement

To improve staff efficiency, the Study Team gave the staffs on spreadsheet application (MS Excel) using the spreadsheet templates developed. The hands-on training was supplemented further with reading materials. The staffs were instructed on the basics of Windows and Excel operation for the updating and reconciliation of the master list, IFR and parcellary maps.

(4) Spreadsheet Template

A spreadsheet template (Excel file) was developed and installed in both replication offices. This spreadsheet template will replace the old lotus file in ASBRIS and Dbase 3 files in UPRIIS. The templates if completed will be used for billing purposes. One of the features of the template is that it automatically computes the ISF in kilos and peso in both wet and dry season. A completed template for TSA 601.1-5 in IA Sapang Kubo in UPRIIS is shown in Table I.5.

5. Results of Trials

5.1 Water Management

(1) First Trial : Increased irrigated area and yield

Water management trials were assessed through these indicators: (a) increase in irrigated service area; and (b) increase in yield. The dry season 2000 (October 1999-February 2000) designated as "before" situation, and the dry season 2001 (October 2000-February 2001), marked as "after" situation were taken for comparison. Six (6) stratified turnout service areas (TSAs) designated as A-6, Aspl-1, MC-6, MC-9. B-3 and MC-14 were selected as sampling areas (stratified) to represent the upper portion, middle portion and lower portion of the system's command area. The location of the sample turnout service areas is presented in Figure I.4.

Generally, the results indicated strong potential to expand irrigated area through improved water deliveries. This can consequently lead to higher cropping intensity and eventually yields. However, there were limitations on the conclusiveness of the results. First, the trial period was very short, covering only the dry season of 2001. Second, the result could have been influenced by favorable weather having unusually much rainfall during the months of late November to mid-December. Third, the yield is affected not only by the water distribution but also by other inputs such as good seeds and proper fertilizer application.

The numerical results of the trials and their descriptions are summarized as follows:

1) Upper portion : Constant irrigated area and decrease in yield.
2) Middle portion : Increase in irrigated area and increase in yield.
3) Lower portion : Mixed results in irrigated area and increase in yield.

Potential Effects of Improved Water Deliveries

Turnout Service Area	Lot Area (ha)	Irrigated Area (ha)		Change	Yield (t/ha)		Change
		Dry 2000	Dry 2001		Dry 2000	Dry 2001	
Upper Portion							
1.ASPL-1	28.37	28.36	28.37	0.02%	4.31	3.65	-15.23%
2. A-6	29.08	28.84	28.88	0.12%	3.71	3.54	-4.50%
Middle Portion							
3. MC-6	31.93	31.02	31.93	2.95%	3.60	3.73	3.73%
4. B-3	20.37	17.37	20.37	17.29%	3.24	3.55	9.57%
Down Portion							
5. MC-9	28.62	23.79	23.79	0%	3.69	3.77	2.27%
6. MC-14	59.76	35.19	31.98	-9.11%	1.76	2.08	18.41%

Source: JICA Study Team

(2) Validation Survey

The validation survey was conducted in July 2001. The main objective is to validate the perceptible impact of the water management improvement plan introduced in September 2000 to February 2001. A total of 120 respondents were randomly selected from the six (6) divisions of Aganan RIS, 80 of which represented the upper and mid streams and the 40 respondents comprise the down stream portion. Figure I.5 shows the location of the sample areas. The recall process of interview covered both the dry and wet seasons. The 80 respondents were interviewed for both the dry and wet seasons while the 40 respondents were interviewed for the wet season, the period where water is only available at the down stream. As a whole, the responses totaled about 200.

Division	Service Area	Total Members	TSA Identification	TSA Area (ha)	No. of Lots	Sample Respondents	
						Dry	Wet
1	544	186	A-6	28.88	25	10	10
	383	201	A-SPL1	28.37	55	10	10
2	355	260	MC-6	33.56	35	15	15
3	380	122	MC-9	25.22	23	10	10
	530	280	B-3	20.17	18	10	10
4	568	126	MC-14	58.12	49	25	25
	431	275	D-1	54.83	63	-	10
5	450	360	B-11a	27.61	22	-	10
	430	154	B-7	36.14	21	-	10
6	455	384	A2-2	33.29	32	-	10
Total	4506	833		346.19	343	80	120

The results of the survey are given in Table I.6. The general observations about the results may be summarized as follows:

1) 86% and 73% of the total respondents " during dry season 2001 and wet season 2001 (May 2001-September 2001), respectively responded "yes" with reference to awareness of the permanent bill boards, indicating that farmers are using the bill boards in water delivery schedule.

2) 88% of the total respondents responded "yes" as regards satisfaction of the water delivered in dry season 2001, the period where gate control operation was introduced and strict observance of water delivery schedule, and in wet season 2001, 83% affirmed the same degree of satisfaction.

3) 88% and 84% of the total respondents during dry and wet seasons 2001 responded "yes" as regards sufficiency of volume of water delivered indicating the positive effect of gate control operation and water delivery schedule.

4) 62% of the total respondents during dry season 2001 responded "no" as regards payment of ISF, though more than 80% of the total respondents were satisfied with water delivery and distribution. The low payment of ISF in the dry season occurred because the payment for the dry season is normally postponed, and being paid only in October, right after the harvest of the wet season crop. Accordingly, production obtained in the dry season, is normally reserved by the farmers to pay for educational expenses of their children in June and payment for farm inputs for the wet season cropping.

5) 83% of the total respondents in wet season 2001 compared to 81% in wet season 2000 revealed that water has reached their farm for land soaking and preparation validating the earlier observation about timely delivery of water.

5.2 ISF Collection

Data from the two Replication Offices showed contrasting results as shown in Table I.7. In UPRIIS District III, there was a net increase of 104 ha in billable area, representing 8.5% of the total service area of 1,118 ha before the capacity improvement plan was implemented.

Among the five pilot IAs, Pitong Gatang IA registered the highest increase of 15.8% followed by Crisol B. Pag-asa at 13%, Sapang Kubo, 12.3% and Gregorio Soledad, 1.1%. Rivera Borual registered negative figure of 3%.

This figure represents potential annual revenue of PHP 98,458 annually to be increased from the pilot IAs. District III has approximately 30,000 ha and extrapolating the result of the capacity improvement plan with this figure, the potential revenue for District III would be approximately PHP2.95 million per annum.

The increase in the service area was primarily due to the inclusion to the updated master list and IFRs of (a) farm lots not listed in LIPA and (b) farm lots previously not shown in the parcellary maps and master lists. The decrease in the farm lots of farmers were basically the conversion of a portion of the lots for residential use.

As regards the ASBRIS Division 3, there was a reduction of 60 ha in the service area of the pilot IAs in Aganan RIS as shown in Table I.8. The reduction of 3 ha in Macabitu, and 56 ha

in Macatuan were primarily caused by the conversion of irrigated lands to residential and domestic use. The reduction in service was equivalent to 6.8% of the total irrigable area of 871 ha. It was significant in Macatuan at 10%, while in Macabitu's, only 1%

In comparison with UPRIIS, Aganan has been updated and reconciling its master list, parcellary maps and IFRs since 1998, while UPRIIS District III did the last updating in 1990.

6. Lessons Learned

(1) Water Management

a. Dissemination on water delivery and distribution schedule

The installation of permanent bulletin boards beside water control structures is effective medium that can influence farmers to follow strictly the water delivery. Timely delivery could then expand irrigated areas and yields.

b. Monitoring of water delivery and distribution

Strict compliance in water delivery and distribution was successfully implemented by foot patrol team composed of NIA's O&M staff and IA members. Mobilizing foot patrol teams are thus useful instruments of control in the strict observance of water delivery.

In addition, simple manuals and basic training program for NIA staff and IAs are practical measures for better water management.

c. Preparation of practical O&M manual

To guide the NIA's O&M staff and the IAs in honing their skills on O&M practices, a simple and illustrative pamphlet on O&M practices is a good medium of learning. Training and technical assistance on the application of the O&M manual should be provided to NIA's O&M staff and the IAs.

d. Development of appropriate training program for NISO staff and the IAs

In order to perform effective O&M works, on on-the-job training is essential. This can be accomplished through frequent staff meetings and seminars so that exchanges of ideas and experiences can be cultivated.

The following physical aspects should be considered as conditions precedent for effective O&M works:

a. Rehabilitation and improvement of the irrigation facilities with installation of measuring devices on the water control structures to perform accurate, proper and effective water delivery and distribution.

b. Installation of settling basin to reduce siltation in canals to improve water flow and reduce maintenance work (desilting) in the canals and O&M cost.

(2) ISF Collection

The lessons learned may be summarized as follows:

a. The results showed that inaccurate or erroneous reporting of benefited areas can significantly reduce ISF collectibles.

b. The results showed the deficiency of the existing billing system; its lack of built-in control especially on the reporting of benefited and exempted areas.

c. The results indicated the importance of regularly updating and reconciling the three basic records/documents: maps, master list and IFRs for billing and collection purposes.

d. The result showed the need for a regular audit not only on the amount collected by the collectors but also on the billed area reported by the Water Masters.

The strategy of learning successful and practical experiences from the model office (Nayom Bayto) and subsequently applying them to Aganan and UPRIIS District III offices should be continuously promoted, because the improvement training process has been introduced only a few months ago under the capacity improvement plan. Further exchange of information and practical ideas can be enhanced through the conduct of cross-visit to the model office. Off-site training where the staff of Aganan and UPRIIS District III can be brought to Nayom-Bayto to observe and assimilate the operations of a successful office should be considered the expanded phase of the capacity improvement plan.

7. Supplemental Survey of Successful NISO in Mindanao and Visayas

(1) Lasang-Libuganon-Kipaliku Office

The purpose of the survey was to acquire additional information on the success features of Mindanao-based NISOs to supplement and refine the capacity improvement plan patterned after Nayom-Bayto's NISO. The Mindanao-based NISO was the Lasang-Libuganon-Kipaliku NIS office. The comparative profile of the two offices is shown below:

Comparative Profile of Lasang-Libuganon-Kipaliku NISO and Nayom-Bayto NISO

Lasang-Libuganon-Kipaliku NISO	Nayom-Bayto NISO
1. Irrigation Service area (ISA)= 16,599 ha	1. Irrigation Service area (ISA)= 1,948 ha
2. Number of farmers= 9,535	2. Number of farmers= 1,630
3. River irrigation system= 3	3. River irrigation system= 2
4. Number of personnel = 79	4. Number of personnel = 22
5. Number of IAs= 17	5. Number of IAs= 13
6. Cropping system = Mixed (Rice and Export Banana with 30% of service area)	6. Cropping system = Pure rice (mono-cropping)
7. Irrigated area	7. Irrigated area
Wet season= 15,750 ha	Wet season= 1,636 ha
Dry season= 14,960 ha	Dry season= 1,580 ha
8. Irrigated area/ISA	8. Irrigated area/ISA
Wet season= 95%	Wet season= 84%
Dry season= 90%	Dry season= 81%
9. Performance Evaluation	9. Performance Evaluation
Cropping intensity = 185%	Cropping intensity = 165%
Collection efficiency = 79%	Collection efficiency = 74%
Income/expense ratio= 2.25	Income/expense ratio = 1.14
Yield/ha of rice= 3.33 tons	Yield/ha of rice = 3.71 tons
Over-all Score = 90	Over-all Score = 75

Source: JICA Study Team

The strength of both office stems, among others, from the maintenance of good infrastructure facilities of the system, strong leadership coupled with competent staff and solid support from the IAs and LGUs. It implies that the experience of Nayom-Bayto NISO can be universally applied elsewhere. The successful features of the Mindanao-based NISO can be considered as follows:

1) Water Management Practices

   a. Feeling of ownership among the IAs is strong, with 17 IAs having existing Type I contract and 7 IAs with Type II contract,

   b. Water delivery for land soaking and preparation is rotational on a 14-day interval with the down portion areas getting the first priority, and continuous irrigation is adopted during normal irrigation period,

   c. Cropping pattern is strictly followed being prepared by the IAs (a good example of bottoms-up planning),

d. Foot patrol is the responsibility of the local police; and stealing of water and illegal diversion rarely occurs, and

e. Volunteerism in maintenance is a common practice among the IAs.

2) ISF Collection

a. Exceptionally good at 70% collection efficiency,

b. Strict adherence to MC No. 71,

c. Annual updating of parcellary maps and master list,

d. Absence of fraudulent billing as the IAs and the NISO jointly perform their respective responsibilities in monitoring of billable areas as well as exempted areas, and

e. Computerized billing system is enforced.

(2) Bohol Irrigation Project (Capayas irrigation system)

One of the systems being assisted by JICA, being a sub-site of the Bohol Integrated Agricultural Promotion Project (BIAPP), is the Capayas irrigation system located in Bohol, Visayas. Capayas whose service area is 750 ha (design service area) is a communal by standard. However, the system is being treated as a NIS in preparation for eventual integration with Stage II of the Bohol irrigation project.

Like other systems, Capayas suffers critical water supply during dry season. As part of the improvement plan, rotation of 3-day interval was introduced under the on-going JICA assistance. Water delivery schedule was prepared for each lateral. The rotation has improved actual irrigated area, from 400 ha to about 530 ha, although this is still short of the planned 750 ha.

As regards ISF collection, the JICA has provided management support to 4 IAs to improve ISF collection. The IAs have existing Type II contract, where NIA gives 10% of ISF collection as compensation to the IAs. Since the start of management support in year 2000, improvement in ISF collectibles has been noted during dry and wet seasons 2000.

Two important lessons are worth noted. First, prepared water delivery schedule, especially if jointly decided between the IAs and NIA's staff is a practical tool in the strict enforcement of rotation system of irrigation. This confirms its applicability to other systems where water supply is limited. Second, the IAs can do the job of ISF collection provided they are properly trained and compensated. The incentive given in Type II contract is a flat 10% of the collection regardless of the collection efficiency. This type works very well and needs to be considered for further application.

8. Organizational Plan for NISO

(1) Proposed Organizational Plan at NISO

The proposal is to merge the NISO and the PIO into the PIMO as described in Chapter 6 of the Main Report. As envisaged, the essential elements of the proposed plan are:

a. Single PIMO at the provincial level,

b. Consolidation of administrative section and strengthening of O&M with the administrative solely confined to wholesale billing, collection and cashiering (see the table below: proposed core positions),

c. O&M to be jointly shared between the PIMO and the IAs,

d. Wholesale transfer of ISF collection to IAs,

e. Strengthened technical support to LGUs and IAs on systems' hardware and institutional components,

f. Skills enhancement of personnel to strike a balance between engineering, institutional, and other related fields to improve water management and crop productivity, and

(2) Water Management

The plan to introduce water rotation based on a fallow period of at least one (1)-cropping season is not acceptable to the farmer beneficiaries. The current practice of rotating water delivery for a 7-day period as exemplified in Aganan RIS is considered the best alternative given the present economic and institutional considerations. This should be supported and adopted in systems where water supply is always critical.

(3) Maintenance

The direction of maintenance work will be pursued within the ambit of the IMT program. This would consist of: (a) shifting responsibility of the WRFTs from ISF collection to maintenance work; (b) strengthening the IAs and enforcement of Type I contract through transfer of responsibility of ISF collection to the IAs; and (c) giving priority of existing NIA equipment for O&M. With clearer delineation of responsibilities between the IAs and NIA pursuant to the IMT, the maintenance workflow given in Figure I.6 will be reinforced. Main and secondary canal for small system and secondary canal for large system will be maintained through strict enforcement of Type I contract during IMT transition. This should pave the way for the O & M staff to focus their efforts on the maintenance of structures and other diversion facilities.

(4) ISF Collection

Some measures needed to reduce costs, which the NISOs can adopt, were identified. However, these measures need time to implement:

1) Gradual Phasing Out of Collection in Kind

Nayom-Bayto and Aganan-Sta. Barbara collections are largely in kind. A shift to cash collection will reduce substantially the collection expenses attributed to paddy collection.

2) Improvement of IA's Collection Capability

Full implementation of the provision of the Type II contract will reduce collection-related expenses. The collection responsibility should be turned-over to the IAs in due time. In Nayom-Bayto and UPRIIS District III, IAs do not collect the ISF but only help in the campaign for ISF collection.

TABLES

Table I.1 Summary of Evaluation NISOs, 1995 – 1999

Level/ Class	A	B	C	Total
1. Nationwide				
1.1 Number of NISO	24	53	28	105
1.2 Proportion (1.1/105)	23%	50%	27%	100%
1.3 Service Area (ha)	170,926	355,434	134,255	660,615
1.4 Proportion (1.3/ 660,615)	26%	54%	20%	100%
2. Island Group				
(1) Luzon				
2.1 Number of NISO	12	29	20	61
2.2 Proportion (2.1/1.1)	43%	58%	72%	59%
2.3 Service Area (ha)	107,480	232,143	95,578	435,201
2.4 Proportion (2.3/1.3)	63%	65%	71%	66%
(2) Visayas				
2.5 Number of NISO	2	8	7	17
2.6 Proportion (2.5/1.1)	8%	15%	25%	16%
2.7 Service Area (ha)	2,517	34,765	36,177	73,459
2.8 Proportion (2.7/1.3)	1%	10%	27%	11%
(3) Mindanao				
2.9 Number of NISO	10	16	1	26
2.10 Proportion (2.9/1.1)	42%	30%	4%	25%
2.11 Service Area (ha)	60,929	88,526	2,500	151,955
2.12 Proportion (2.11/1.3)	36%	25%	2%	23%
3. Total				
3.1 Number of NISO	24	53	28	105
3.2 Percent	100%	100%	100%	100%
3.3 Service Area (ha)	170,926	355,434	134,255	660,615
3.4 Percent	100%	100%	100%	100%

Source: JICA Study Team

Legend: A- Good
B – Fair/Average
C - Poor

Table I.2 Performance of NISOs, 1995-1999 (1/4)

Region / ISO			Service Area (ha)	Absolute Values				Relative Scores				Total Score	Rating
				Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha	Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha		
		Region 1											
1	1	Amburayan	3420	138	19	0.73	5.48	15	5	5	25	50	B
2	2	Agno-Sinocalan	12663	104	30	0.77	4.38	10	10	5	25	50	B
3	3	Ambayaon-Dipalo	6402	60	23	0.82	4.50	5	5	5	20	35	C
4	4	Ilocos Norte	17034	146	55	0.92	4.34	15	15	10	20	60	B
5	5	Ilocos Sur	3806	105	34	0.83	4.38	10	10	5	20	45	C
6	6	Lower Agno-Totonuguen	7500	73	42	0.70	4.13	5	15	5	20	45	C
7	7	Masalip	1453	144	33	0.85	4.00	15	10	5	20	50	B
8	8	San Fabian-Dumuloc	3594	104	32	0.76	4.63	10	10	5	25	50	B
		Region 2											
9	1	Apayao-Abulog Pamplona	10,794	72	44	0.81	3.42	5	15	5	15	40	C
10	2	Baggao	2,067	133	57	0.98	3.85	15	20	10	15	60	B
11	3	Baua	2,419	74	67	0.88	4.30	5	20	10	20	55	B
12	4	Banurbur	1087	140	65	1.34	3.85	15	20	20	15	70	A
13	5	Dummun	1,802	147	53	1.31	4.38	15	15	20	20	70	A
14	6	Iguig-Alcala-Amulung	2306	75	69	1.29	3.68	5	20	20	15	60	B
15	7	Lower Chico	1856	86	68	0.72	na	5	20	5	5	35	C
16	8	Magapit	10914	109	64	1.49	3.15	10	20	20	15	65	B
17	9	Mallig	2427	127	59	0.70	2.86	15	20	5	10	50	B
18	10	San Pablo-Cabagan	1273	57	55	0.64	3.95	5	15	5	20	45	C
19	11	Solana	2777	36	44	0.58	4.00	5	15	5	20	45	C
20	12	Pinacanauan-Tumauini	4495	146	34	1.03	3.99	15	10	15	20	60	B
21	13	Zinundungan	2045	157	64	1.09	3.48	20	20	15	15	70	A
22	14	Nueva Vizcaya Bagabag	2160	na	Na	na	na	5	5	5	5	20	C
		Region 3											
23	1	Angat-Maasin	31485	142	34	1.00	4.25	15	10	10	20	55	B
24	2	Bucao	1231	41	27	1.18	3.38	5	10	15	15	45	C
25	3	Camiling	8580	111	12	0.97	3.90	10	5	10	20	45	C
26	4	Colo-Caulaman	1021	61	70	0.96	3.75	5	20	10	15	50	B
27	5	Porac-Gumain	4004	77	50	1.29	3.63	5	15	20	15	55	B
28	6	Nayom-Bayto	1948	165	74	1.14	3.71	20	25	15	15	75	A
29	7	Nueva Ecija PIS	1313	43	44	0.59	4.25	5	15	5	20	45	C
30	8	Tasmoris	13297	39	11	0.86	3.80	5	5	10	15	35	C
31	9	Sto. Tomas(not operational)	3924	na	Na	na	na	5	5	5	5	20	C

Table I.2 Performance of NISOs, 1995-1999 (2/4)

Region / ISO			Service Area (ha)	Absolute Values				Relative Scores				Total Score	Rating
				Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha	Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha		
		Region 4											
32	1	Agos	1119	173	44	0.76	3.25	20	15	5	15	55	B
33	2	Amnay-Patrick-Mompong	2213	116	46	1.19	3.00	10	15	15	10	50	B
34	3	Malatgao-Batang-Batang	3678	173	60	0.97	3.38	20	20	10	15	65	B
35	4	Baco-Bucayao-Magasawang Tubig	8027	114	18	0.86	4.20	10	5	10	20	45	C
36	5	Catingas	256	204	9	na	3.33	25	5	5	15	50	B
37	6	Caguray	3308	39	20	0.98	4.50	5	5	10	25	45	C
38	7	Cavite Friar Lands	13,086	86	37	0.66	3.50	5	10	10	15	40	C
39	8	Disalit	485	84	33	0.91	3.25	5	10	10	15	40	C
40	9	Dumacaa-Hanagdong-Lagnas	3309	149	41	0.95	4.00	15	15	10	20	60	B
41	10	Laguna Friar Lands	3250	113	16	0.99	3.50	10	5	10	15	40	C
42	11	Lumintao	1504	104	52	0.54	3.63	10	15	5	15	45	C
43	12	Pagbahan	1005	109	42	0.69	3.75	10	15	5	15	45	C
44	13	Palico	886	176	30	0.76	4.13	25	10	5	20	60	B
45	14	Pula Bansod	3830	176	32	1.14	4.05	25	10	15	20	70	A
46	15	Sta Cruz-Mabacan-Balanac	4977	177	36	0.61	3.50	25	10	5	15	55	B
47	16	Sta Maria-Mayor	1773	114	62	0.91	4.25	10	20	10	20	60	B
		Region 5											
48	1	Barit-Rida-Buhi-lalo	7208	105	32	1.05	3.90	10	10	15	20	55	B
49	2	Cagaycay	1745	141	52	0.89	5.62	15	15	10	25	65	B
50	3	Daet-Talisay-Matogdon	2910	172	50	1.12	3.51	25	15	15	15	70	A
51	4	Libmanan-Cabusao	2195	77	68	1.00	4.03	5	20	10	20	55	B
52	5	MNOH	1946	187	8	2.41	3.51	25	5	25	15	70	A
53	6	Pili-Bulan-San Francisco	950	158	50	0.81	3.95	20	15	5	20	60	B
54	7	Inarihan-Tigman-Hinagyanan	3542	126	52	1.39	4.35	15	15	20	20	70	A
		Region 6											
55	1	Aganan-Sta Barbara	8262	123	24	0.95	4.43	10	5	10	20	45	C
56	2	Aklan-Panakuyan	4816	175	19	1.05	3.93	20	5	15	20	60	B
57	3	Bago	12700	123	40	1.05	3.20	10	10	15	15	50	B
58	4	Barotac Viejo	1774	114	39	0.89	2.43	10	10	10	15	45	C
59	5	Jalaur-Suage Extn	14400	125	25	0.94	3.43	10	5	10	15	40	C
60	6	Mambusao	1423	129	33	0.68	4.08	15	10	5	20	50	B
61	7	Pangiplan	1756	128	48	0.82	3.38	15	15	5	15	50	B
62	8	Sibalom-Tigbauan	2020	118	35	0.80	3.38	10	10	5	15	40	C
63	9	Sibalom-San Jose	5065	140	24	0.92	4.00	15	5	10	20	50	B
		Regions 7 and 8											
64	1	Bao	1917	169	48	0.93	3.76	20	15	10	15	60	B
65	2	Balire-Ibawon-Gibuga	1715	128	31	0.66	4.13	15	10	5	20	50	B
66	3	Binahaan-Tibak	6041	130	34	0.66	3.50	15	10	5	15	45	C
67	4	Daguitan-Guinarona	1496	98	33	0.69	3.88	5	10	5	20	40	C
68	5	Hindang-Hilongos-Dasay	1106	186	47	1.00	4.19	25	15	10	20	70	A
69	6	Mainit-Pongso	2184	99	51	0.83	3.96	5	15	5	20	45	C
70	7	Bito	1411	137	52	0.75	4.24	15	15	25	20	75	A
71	8	Bohol IP	5373	149	56	0.87	4.13	15	20	10	20	65	B

Table I.2 Performance of NISOs, 1995-1999 (3/4)

Region / ISO			Service Area (ha)	Absolute Values				Relative Scores				Total Score	Rating
				Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha	Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha		
		Region 9											
72	1	Labangan	3195	110	56	1.17	4.00	10	20	15	20	65	B
73	2	Dipolo-Salug	8824	137	65	1.85	3.46	15	20	25	15	75	A
74	3	Sibuguey	3143	102	42	1.38	2.90	10	15	20	10	55	B
		Region 10											
75	1	Manupali	4395	51	56	1.43	4.05	5	20	20	20	65	B
76	2	Muleta	4063	66	66	1.28	3.50	5	20	20	15	60	B
77	3	Pulangi-Roxas Kuya	12238	170	77	2.09	4.22	20	25	25	20	90	A
		Region 11											
78	1	Allah-Banga-Marbel	18209	138	45	1.47	3.79	15	15	20	15	65	B
79	2	Lasang-Libuganon-Kipaliku	15767	185	79	2.25	3.33	25	25	25	15	90	A
80	3	Lupon	2450	200	54	1.18	4.50	25	15	15	20	75	A
81	4	Mal-Padada	6125	174	82	2.56	5.09	20	25	25	25	95	A
82	5	Saug-Libuganon(Left)	4550	184	37	0.80	3.46	25	10	5	15	55	B
83	6	Siluay-Buayan	2116	144	61	1.77	3.66	15	20	25	15	75	A
84	7	Batutu	3269	161	63	1.38	4.00	20	20	20	20	80	A
		Region 12											
85	1	Alip-Talayan	2600	133	58	1.94	2.99	15	20	25	10	70	A
86	2	Kabacan-Pagalungan	5335	145	43	1.11	2.69	15	15	15	10	55	B
87	3	Libungan	9495	151	35	1.13	3.45	20	10	15	15	60	B
88	4	Maranding	4927	125	44	1.31	2.85	10	15	20	10	55	B
89	5	Malasila-Mlang	6987	151	25	1.03	3.60	20	5	15	15	55	B
90	6	Lambayong-Dumaguil	13355	138	25	1.21	3.25	15	5	20	15	55	B
91	7	Rugnan	2500	90	48	0.93	2.80	5	15	10	10	40	C
		Region 13											
92	1	Andanan	5000	148	68	1.40	3.63	15	20	20	15	70	A
93	2	Cabadbaran-Taguibo	3213	125	48	1.91	3.20	10	15	25	15	65	B
94	3	Cantillan	1785	158	26	0.88	2.85	20	10	10	10	50	B
95	4	Gibong	2158	162	52	1.25	2.93	20	15	20	10	65	B
96	5	Simulao	2540	185	55	1.14	3.17	25	15	15	15	70	A
97	6	Tago	3716	138	38	1.52	3.67	15	10	25	15	65	B

Table I.2 Performance of NISOs, 1995-1999 (4/4)

Region / ISO			Service Area (ha)	Absolute Values				Relative Scores				Total Score	Rating
				Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha	Cropping Intensity	Collection Efficiency	Income-Expense ratio	Yield/ha		
		MRIIS											
98	1	District 1	21797	156	52	1.15	4.23	20	15	15	20	70	A
99	2	District 2	23241	175	56	1.29	3.63	20	20	20	15	75	A
100	3	District 3	23442	134	65	1.23	3.38	15	20	20	15	70	A
101	4	District 4	19890	158	64	1.35	4.48	20	20	20	20	80	A
		UPRISS											
102	1	District 1	24962	144	39	1.00	4.35	15	10	10	20	55	B
103	2	District 2	23913	153	21	0.89	3.45	20	5	10	15	50	B
104	3	District 3	29846	123	42	0.88	3.55	10	15	10	15	50	B
105	4	District 4	23811	119	53	1.04	3.45	10	15	15	15	55	B
			maximum	204	82	2.56	5.62				95		
			minimum	36	8	0.54	2.43				20		
			mean	127	45	1.07	3.77				56		
			std	40	17	0.38	0.55				14		

Source: JICA Study Team Based on Raw Data of Systems Management Department, NIA

Notes: 1. 1998 was excluded as it was an abnormal year
2. Collection efficiency is based on current account
3. There are actually 107 NISOs, 2 of which have barely started operation

Legend : A – Good
B – Fair/Average
C – Poor

Table I.3 Proposals to Improve the Situation of Water Management (1/3)

Location	Category	AREAS									
		Luzon				Visayas		Mindanao		Total	
		Nueva Ecija		Zambales		Iloilo		Davao			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
NIS											
Upstream	NIA should allocate fund for repair and maintenance of irrigation facilities	0	0.0	0	0.0	0	0.0	8	32.0	8	10.3
	Provide honorarium to IA officers	0	0.0	0	0.0	0	0.0	2	8.0	2	2.6
	IA allocate budget for salary of members who help and maintain the facilities	0	0.0	0	0.0	0	0.0	0	0.0	0	0
	Conduct of seminars/trainings/trip for IA officers	0	0.0	0	0.0	0	0.0	2	8.0	2	2.6
	Strict implementation of policies on water management	0	0.0	0	0.0	0	0.0	11	44.0	11	14.1
	There should be good communication bet. IA and NIA	1	5.9	0	0.0	0	0.0	1	4.0	2	2.6
	Intensify strengthening of IA & reac-tivate membership	8	47.1	0	0.0	0	0.0	1	4.0	9	11.5
	Re-organizae the IA change leadership	3	17.6	6	66.7	13	48.1	0	0.0	22	28.2
	Desilt bottom canal and widen irrigation canal	1	5.9	0	0.0	0	0.0	0	0.0	1	1.3
	Strict implementation of membership policies	4	23.5	0	0.0	0	0.0	0		4	5.1
	Improve facilities/proper maintenance of facilities	0	0.0	2	22.2	0	0.0	0	0.0	2	2.6
	Construct reservoir	0	0.0	0	0.0	1	3.7	0	0.0	1	1.3
	Clean and maintain the irrigation canal	0	0.0	0	0.0	1	3.7	0	0.0	1	1.3
	Follow schedule of water distribution	0	0.0	0	0.0	12	**44.4**	0	0.0	12	15.4
	No comment	0	0.0	1	11.1	0	0	0	0.0	1	1.3
Sub-Total:		**17**	**100.0**	**9**	**100.0**	**27**	**100.0**	**25**	**100.0**	**78**	**100.0**

Source: Beneficiary Farmers' Intention Survey, JICA Study Team, 2000

Table I.3 Proposals to Improve the Situation of Water Management (2/3)

Location	Category	AREAS								Total	
		Luzon				Visayas		Mindanao			
		Nueva Ecija		Zambales		Iloilo		Davao			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Midstream	Additional information on irrigation facility management	0	0.0	0	0.0	0	0.0	2	5.4	2	2.9
	Conduct training on water management	0	0.0	0	0.0	0	0.0	12	32.4	12	17.6
	Conduct of training/seminars both to IA and NIA personel	0	0.0	1	11.1	0	0.0	7	18.9	8	11.8
	Enforce law/regulation on water management & impose sanction for non compliance	0	0.0	2	22.2	5	**31.3**	4	10.8	11	16.2
	Construct better facilities of canals & access roads	0	0.0	0	0.0	0	0.0	2	5.4	2	2.9
	Encourage farmers to pay ISF so that fund will be available for repairs and maintenance	0	0.0	0	0.0	0	0.0	2	5.4	2	2.9
	Allocation of fund operation and maintenance	0	0.0	0	0.0	0	0.0	4	10.8	4	5.9
	Improve water distribution	0	0.0	0	0.0	0	0.0	4	10.8	4	5.9
	Improve irrigation services	2	33.3	0	0.0	2	12.5	0	0.0	4	5.9
	NIA's assistance in orienting and briefing new President of roles and responsibilities	4	66.7	0	0.0	0	0.0	0	0.0	4	5.9
	New set of officers to motivate the members to be active again	0	0.0	4	44.4	0	0.0	0	0.0	4	5.9
	Give salary to water tender	0	0.0	0	0.0	1	6.3	0	0.0	1	1.5
	Reorganize IA	0	0.0	0	0.0	7	43.8	0	0.0	7	10.3
	No answer	0	0.0	0	0.0	1	6.3	0	0.0	1	1.5
	No comment	0	0.0	2	22.2	0	0.0	0	0.0	2	2.9
Sub-Total:		**6**	**100.0**	**9**	**100.0**	**16**	**100.0**	**37**	**100.0**	**68**	**100.0**

Source: Beneficiary Farmers' Intention Survey, JICA Study Team, 2000

Table I.3 Proposals to Improve the Situation of Water Management (3/3)

Location	Category	AREAS									
		Luzon				Visayas		Mindanao		Total	
		Nueva Ecija		Zambales		Iloilo		Davao			
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Downstream	Concrete canal linings	0	0.0	0	0.0	0	0.0	1	1.4	1	0.9
	Allocation fundings for repair and maintenance	0	0.0	1	4.3	0	0.0	15	21.7	160	14.0
	Repair/upgrade all facilities and distribute water through channel	2	9.1	0	0.0	0	0.0	9	13.0	110	9.6
	Trainings/seminars/exchange visits to DA officials	0	0.0	6	26.1	0	0.0	19	27.5	250	21.9
	Provide honorarium to officers	0	0.0	0	0.0	0	0.0	9	13.0	9	7.9
	Strengthen the association	0	0.0	0	0.0	0	0.0	13	18.8	13	11.4
	Involve members in all the activities	0	0.0	0	0.0	0	0.0	3	4.3	3	2.6
	Improve irrigation services	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Motivate general membership	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	Improve water distribution	2	9.1	0	0.0	0	0.0	0	0.0	2	1.8
	Reg. Communication bet. IA/NIA conduct members	4	18.2	0	0.0	0	0.0	0	0.0	4	3.5
	Improve and implement policy on membership	10	45.5	1	4.3	0	0.0	0	0.0	110	9.6
	IA should call for a regular meeting with members	4	18.2	0	0.0	0	0.0	0	0.0	40	3.5
	Reorganize/elect new set of officials	0	0.0	15	65.2	0	0.0	0	0.0	15	1.2
Sub-Total:		**22**	**100.0**	**23**	**100.0**	**0**	**0**	**69**	**100.0**	**114**	**100.0**
TOTAL NIS:		**45**		**41**				**131**		**260**	

Source: Beneficiary Farmers' Intention Survey, JICA Study Team, 2000

Table I.4 Gate Operation Schedule For Water Delivery In Aganan RIS

Headgate of Lateral A

Engineer in Charge: Mr. Melchor I. Bajande (Operation Engineer)
Gate Operator: Mr. Paterno Talite (WRFT)
Witness: Vice President of PASAMISBA IA

Water Delivery to Area-A			Water Delivery to Area-B & C		
Month	Open		Month	Close	
	Date	Time		Date	Time
May	1	8:00 AM	May	8	8:00 AM
	24	8:00 AM		31	8:00 AM
Jun.	16	8:00 AM	Jun.	23	8:00 AM
Jul.	9	8:00 AM	Jul.	16	8:00 AM
Aug.	1	8:00 AM	Aug.	8	8:00 AM
	24	8:00 AM		31	8:00 AM
Sep.	16	8:00 AM	Sep.	23	8:00 AM
Oct.	9	8:00 AM	Oct.	16	8:00 AM
Nov.	1	8:00 AM	Nov.	8	8:00 AM
	24	8:00 AM	Dec.	1	8:00 AM
Dec.	17	8:00 AM		24	8:00 AM
Jan.	9	8:00 AM	Jan.	16	8:00 AM
Feb.	1	8:00 AM	Feb.	8	8:00 AM
	24	8:00 AM	Mar.	1	8:00 AM

Checkgate for Lateral A

Engineer in Charge: Mr. Melchor I. Bajande (Operation Engineer)
Gate Operator: Mr. Paterno Talite (WRFT)
Witness: Vice President of PASAMISBA IA

Water Delivery to Area-B & C			Water Delivery to Area-A		
Month	Open		Month	Close	
	Date	Time		Date	Time
			May	1	8:00 AM
May	8	8:00 AM		24	8:00 AM
	31	8:00 AM	Jun.	16	8:00 AM
Jun.	23	8:00 AM	Jul.	9	8:00 AM
Jul.	16	8:00 AM	Aug.	1	8:00 AM
Aug.	8	8:00 AM		24	8:00 AM
	31	8:00 AM	Sep.	16	8:00 AM
Sep.	23	8:00 AM	Oct.	9	8:00 AM
Oct.	16	8:00 AM	Nov.	1	8:00 AM
Nov.	8	8:00 AM		24	8:00 AM
Dec.	1	8:00 AM	Dec.	17	8:00 AM
	24	8:00 AM	Jan.	9	8:00 AM
Jan.	16	8:00 AM	Feb.	1	8:00 AM
Feb.	8	8:00 AM		24	8:00 AM

Headgate of Lateral B

Engineer in Charge: Mr. Melchor I. Bajande (Operation Engineer)
Gate Operator: Mr. Luis Ecube (WRFT)
Witness: Vice President of SAMICASA IA

Water Delivery to Area-B			Water Delivery to Area-C		
Month	Open		Month	Close	
	Date	Time		Date	Time
May	8	8:00 AM	May	16	8:00 AM
	31	8:00 AM	Jun.	8	8:00 AM
Jun.	23	8:00 AM	Jul.	1	8:00 AM
Jul.	16	8:00 AM		24	8:00 AM
Aug.	8	8:00 AM	Aug.	16	8:00 AM
	31	8:00 AM	Sep.	8	8:00 AM
Sep.	23	8:00 AM	Oct.	1	8:00 AM
Oct.	16	8:00 AM		24	8:00 AM
Nov.	8	8:00 AM	Nov.	16	8:00 AM
Dec.	1	8:00 AM	Dec.	9	8:00 AM
	24	8:00 AM	Jan.	1	8:00 AM
Jan.	16	8:00 AM		24	8:00 AM
Feb.	8	8:00 AM	Feb.	16	8:00 AM

Checkgate for Lateral B

Engineer in Charge: Mr. Melchor I. Bajande (Operation Engineer)
Gate Operator: Mr. Luis Ecube (WRFT)
Witness: Vice President of SAMICASA IA

Water Delivery to Area-C			Water Delivery to Area-B		
Month	Open		Month	Close	
	Date	Time		Date	Time
			May	8	8:00 AM
May	16	8:00 AM		31	8:00 AM
Jun.	8	8:00 AM	Jun.	23	8:00 AM
Jul.	1	8:00 AM	Jul.	16	8:00 AM
	24	8:00 AM	Aug.	8	8:00 AM
Aug.	16	8:00 AM		31	8:00 AM
Sep.	8	8:00 AM	Sep.	23	8:00 AM
Oct.	1	8:00 AM	Oct.	16	8:00 AM
	24	8:00 AM	Nov.	8	8:00 AM
Nov.	16	8:00 AM	Dec.	1	8:00 AM
Dec.	9	8:00 AM		24	8:00 AM
Jan.	1	8:00 AM	Jan.	16	8:00 AM
	24	8:00 AM	Feb.	8	8:00 AM
Feb.	16	8:00 AM			

Headgate of Lateral C & D

Engineer in Charge: Mr. Melchor I. Bajande (Operation Engineer)
Gate Operator: Mr. Abundio Janobas (WRFT)
Witness: Vice President of MACABITU IA and SALAMBITU IA

Water Delivery to Area-C			For Canal Maintenance		
Month	Open		Month	Close	
	Date	Time		Date	Time
May	1	8:00 AM	Mar.	1	8:00 AM

Table I.5 List of Billed Irrigation Service Fee Collectibles for Wet Season, 2000 (UPRIIS District III)

Division C IA: Sapang Kubo TSA: 601.1-5				Lot	Not	Area	ISF Collectibles (Kilos) W. Season			ISF Collectibles - In Pesos W. Season			
BSA No.	Lot No.	CAD No.	Landowner	Size	Planted	Planted	<=2	>2 <=5	>5	<=2	>2 <=5	>5	Total
1	20506	1655 E	DELA CRUZ, JESSIE	1.00		1.00	75.00			675.00			675.00
2	20507	1655 F	DELA CRUZ, ELEUTERIO	1.00		1.00	75.00			675.00			675.00
3	20508	1655 G	DELA CRUZ, FELIX	1.75		1.75	131.25			1,181.25			1,181.25
4	20509	1655 H	CRUZ, DEMETRIO	2.00		2.00	150.00			1,350.00			1,350.00
5	20510	1655 I	VALERIANO, PONCIANO	2.00		2.00	150.00			1,350.00			1,350.00
6	20511	1655 J	VILLAREAL, DAISY	3.00		3.00		375.00			2,025.00		2,025.00
7	20512	2235 A	DELA CRUZ, DALMACIO	0.50		0.50	37.50			337.50			337.50
8	20513	1655 K	DIAZ, FLORENCIO	3.50		3.50		437.50			2,362.50		2,362.50
9	20514	1655 L	DELA CRUZ, DALMACIO	2.50		2.50		312.50			1,687.50		1,687.50
10	20515	1655 M	PAGUIA, FLORANTE	1.00		1.00	75.00			675.00			675.00
11	20516	1655 N	NUNEZ, EDGARDO	3.00		3.00		375.00			2,025.00		2,025.00
12	20517	2235 B	DELA CRUZ, DALMACIO	1.00		1.00	75.00			675.00			675.00
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
Total				22.25	0.00	22.25	768.75	1,500.00	0.00	6,918.75	8,100.00	0.00	15,018.75

Table I.6 Perceptible Impact of water delivery schedule and allocation

Aganan RIS, July 2001

DRY SEASON

Questions	Division 1			Division 2			Division 3			Division 4			Division 5			Division 6			**Total**		**Grand**
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	**Total**
1. Do you know the permanent bulletin boards showing water	10	10	20	15		15	20	0	20	24	1	25	0	0	0				69	11	80
delivery schedule beside the head gate of laterals A,B &C?	50%	50%	100%	100%		100%	100%	0	100%	96%	4%	100%			0				86%	14%	100%
2. Are you satisfied with the water delivery & distribution	11	9	20	15		15	19	1	20	25	0	25	0	0	0				70	10	80
schedule during the dry season 2001 (Oct.2000-Feb.2001)?	55%	45%	100%	100%		100%	95%	5%	100%	100%	0	100%			0				88%	13%	100%
3. Was the volume of water delivered in your farm sufficient	11	9	20	15		15	19	1	20	25	0	25	0	0	0				70	10	80
during the dry season 2001?	55%	45%	100%	100%		100%	95%	5%	100%	100%	0	100%			0				88%	13%	100%
4. Did you pay ISF for water supply of the following																					
cropping seasons?																					
(a) Dry Season 2000	11	9	20	7	8	15	10	10	20	12	12	24			0				40	39	79
	55%	45%	100%	47%	53%	100%	50%	50%	100%	50%	50%	100%			0%				51%	49%	100%
(b) Wet Season 2000	8	12	20	9	6	15	7	13	20	6	18	24			0				30	49	79
	40%	60%	100%	60%	40%	100%	35%	65%	100%	25%	75%	100%			0%				38%	62%	100%

WET SEASON

Questions	Division 1			Division 2			Division 3			Division 4			Division 5			Division 6			**Total**		**Grand**
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	**Total**
1. Do you know the permanent bulletin boards showing water	10	10	20	15		15	10	10	20	22	3	25	18	2	20	13	7	20	88	32	120
delivery schedule beside the head gate of laterals A,B &C?	50%	50%	100%	100%		100%	50%	50%	100%	88%	12%	100%	90%	10%	100%	65%	35%	100%	73%	27%	100%
2. Are you satisfied with the water delivery & distribution	18	2	20	15		15	10	10	20	24	1	25	17	3	20	16	4	20	100	20	120
schedule during the dry season 2001 (Oct.2000-Feb.2001)?	90%	100%	100%	100%		100%	50%	50%	100%	96%	4%	100%	85%	15%	100%	80%	20%	100%	83%	17%	100%
3. Was the volume of water delivered in your farm sufficient	19	1	20	15		15	11	10	21	25	0	25	17	3	20	14	5	19	101	19	120
during the dry season 2001?	95%	5%	100%	100%		100%	52%	48%	100%	100%		100%	85%	15%	100%	74%	26%	100%	84%	16%	100%
4. Did water reach your farm timely for land soaking &																					
preparation during the following cropping seasons?																					
(a) Dry Season 2000	16	4	20	12	3	15	16	4	20	21	4	25	15	5	20	17	3	20	97	23	120
	80%	45%	125%	80%	20%	100%	80%	20%	100%	84%	16%	100%	85%	15%	100%	85%	15%	100%	81%	19%	100%
(b) Wet Season 2000	18	2	20	14	1	15	15	5	20	19	6	25	16	4	20	18	2	20	100	20	120
	90%	10%	100%	93%	7%	100%	75%	25%	100%	76%	24%	100%	85%	15%	100%	90%	10%	100%	83%	17%	100%

Table I.7 Capaciy Improvement Plan - Updating of Master List and IFRs (UPRIIS District III)

Irrigators Associations (IAs)	No. of Farm Lots				Billable Area			
	New	Old	Inc/(Dec)	%	New	Old	Inc/(Dec)	%
Sapang Kubo								
1 601-1-3A	16	14	2		29.20	25.95	3.25	
2 *601-1-3B*	14	14	0		35.25	33.75	1.50	
3 601-1-4	21	20	1		48.85	45.65	3.20	
4 601-1-5	11	12	-1		22.75	22.25	0.50	
5 601-1-7 **	7	10	-3		13.75	18.75	-5.00	
6 601-1-6	20	19	1		47.50	45.50	2.00	
7 601-2-1	31	30	1		63.55	54.95	8.60	
Sub-Total	120	119	1	0.01	260.85	246.80	14.05	5.4%
Crisol B. Pag-asa								
1 601-3	11	8	3		30.60	26.50	4.10	
2 601-4	18	16	2		25.25	21.12	4.13	
3 601-5	14	12	2		26.50	21.60	4.90	
4 601-6	4	4	0		20.00	20.00	0.00	
5 601-7	23	24	-1		42.30	40.90	1.40	
Sub-Total	70	64	6	0.09	144.65	130.12	14.53	10.0%
Rivera Borual								
1 MC-16	6	7	-1		23.85	25.05	-1.20	
2 MC-17	14	16	-2		34.60	40.80	-6.20	
3 600-S	2	2	0		6.50	8.50	-2.00	
4 601-1	12	12	0		24.80	24.90	-0.10	
5 601-2	19	18	1		33.34	33.75	-0.41	
6 601.1-1	34	35	-1		14.65	17.50	-2.85	
7 601.1-2	41	40	1		70.20	66.34	3.86	
Sub-Total	128	130	-1	-0.01	207.94	216.84	-8.90	-4.3%
Pitong Gatang								
1 600-2	13	9	4		33.60	27.00	6.60	
2 600-3	22	21	1		30.75	24.85	5.90	
3 600-5	32	30	2		41.15	39.95	1.20	
4 600-S1	14	13	1		23.80	23.80	0.00	
5 600-S1A	4	4	0		10.75	9.40	1.35	
6 602-1	5	4	1		13.10	11.00	2.10	
7 602-2	16	14	2		51.50	40.50	11.00	
8 602-S2	5	5	0		13.50	13.50	0.00	
9 602-S3	9	9	0		9.00	9.00	0.00	
10 MC-18	8	6	2		20.70	20.50	0.20	
11 MC-S6	4	4	0		6.25	7.25	-1.00	
12 MC-S7	4	4	0		4.35	4.20	0.15	
13 X602.1-1	4		4		25.00		25.00	
14 X602.1-2	2	7	-5		5.25	31.25	-26.00	
15 X602.1-6	30		30		64.50	20.80	43.70	
16 X602.1-7	31		31		48.95	48.45	0.50	
Sub-Total	203	130	73	0.36	402.15	331.45	70.70	17.6%
San Gregorio-Soledad								
1 600-4	22	21	1		31.40	27.70	3.70	
2 600-6	17	17	0		31.95	27.00	4.95	
3 605-1	29	31	-2		40.14	39.14	1.00	
4 605-2	31	29	2		46.97	42.05	4.92	
5 605-3	15	15	0		20.8	18.70	2.10	
6 605-4	10	11	-1		20.25	25.75	-5.50	
7 605.1-1	22	20	2		28.7	27.10	1.60	
8 605.1-2	13	13	0		16.75	15.75	1.00	
9 605.1-3	31	31	0		40.84	40.84	0.00	
Sub-Total	190	188	2	0.01	277.80	264.03	13.77	5.0%
Grand Total	711	631	80	11%	1,293.39	1,189.24	104.15	8.1%

Table I.8 Capacity Improvement Plan-Updating of Master List and IFRs (ASBRIS)

TSA NO.	No. of Lots	Service Area (old)	Service Area (new)	Non-Farming Areas	Remarks
IA: Macabitu					
1. MC-9 & C-1	82	73.8817	73.6167	0.2650	Res. & Others
2. C-2	40	50.9562	49.9508	1.0054	Res. & Others
3. C-3	49	47.0078	46.2048	0.8030	Res. & Others
4. MC-10	51	33.1290	32.4462	0.6828	Res. & Others
5. MC-11	68	69.4827	68.8427	0.6400	Res. & Others
6. MC 12 & 13	67	63.8889	63.8363	0.0526	Res. & Others
	357	338.3463	334.8975	3.4488	
IA: Macatuan					
1. B-1	35	38.0391	34.9767	3.0624	Res. & Others
2. B-2	43	44.7131	44.2296	0.4835	Res. & Others
3. B-3	22	24.2632	23.9674	0.2958	Res. & Others
4. B-4	25	32.3288	31.2687	1.0601	Res. & Others
5. B-5	31	51.1375	48.2810	2.8565	Res. & Others
6. B-6	22	25.8286	25.8286	-	Res. & Others
7. B1-1	47	50.0529	47.3524	2.7005	Res. & Others
8. B1-2	33	32.8957	32.4520	0.4437	Res. & Others
9. B1-3	60	69.7720	68.5614	1.2106	Res. & Others
10. B1-4	32	26.4991	25.4536	1.0455	Res. & Others
11. B1-5	21	35.2004	35.1320	0.0684	Res. & Others
12. B2-1	23	43.1165	38.0705	5.0460	Res. & Others
13. B2-2	29	58.8876	21.0333	37.8543	Res. & Others
	423	532.7345	476.6072	56.1273	
	780	871.0808	811.5047	59.5761	

Source: JICA Study Team

FIGURES

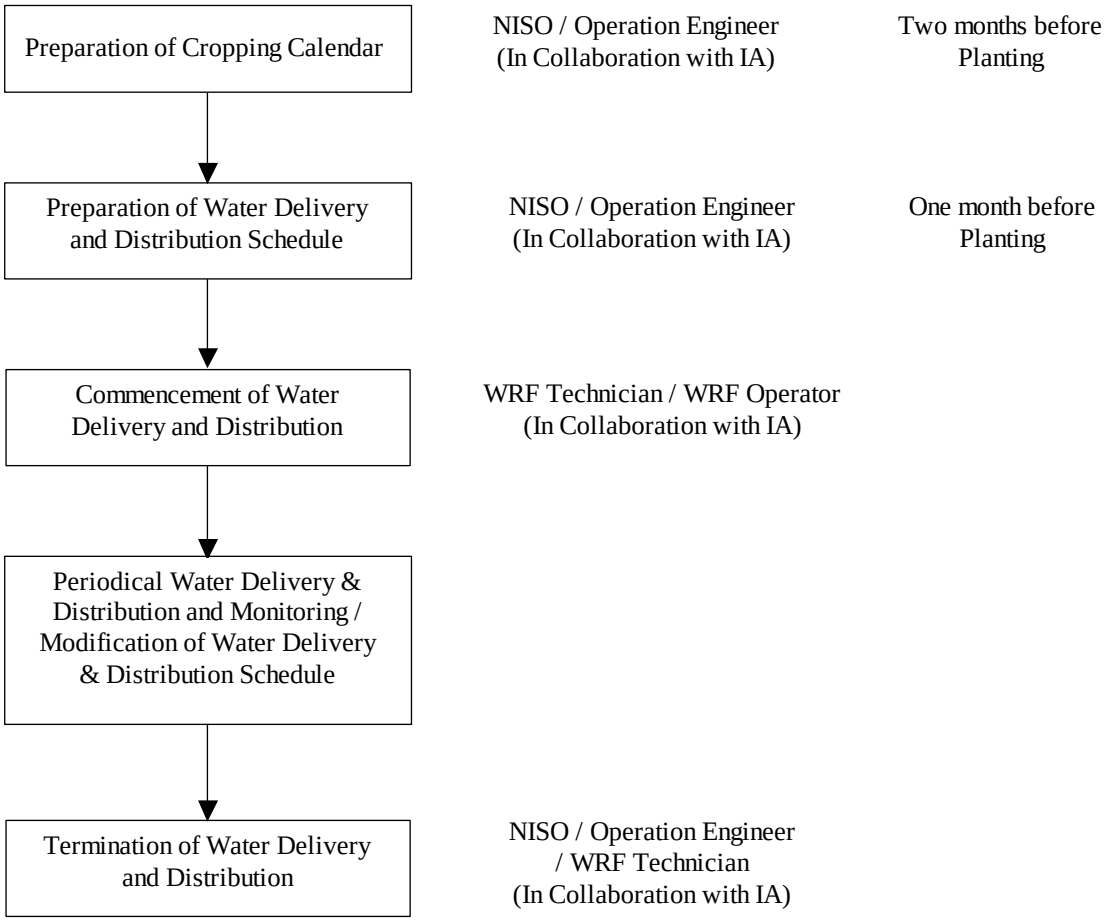
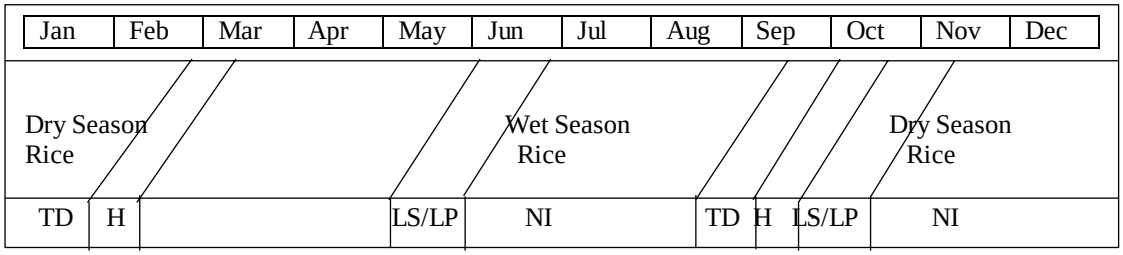


Figure I.1 Water Management Activities of NISO



Cropping Pattern for Aganan RIS

Legend: LS/LP- Land soaking/land preparation; NI – Normal irrigation;
TD – Terminal drainage; and H – Harvesting.

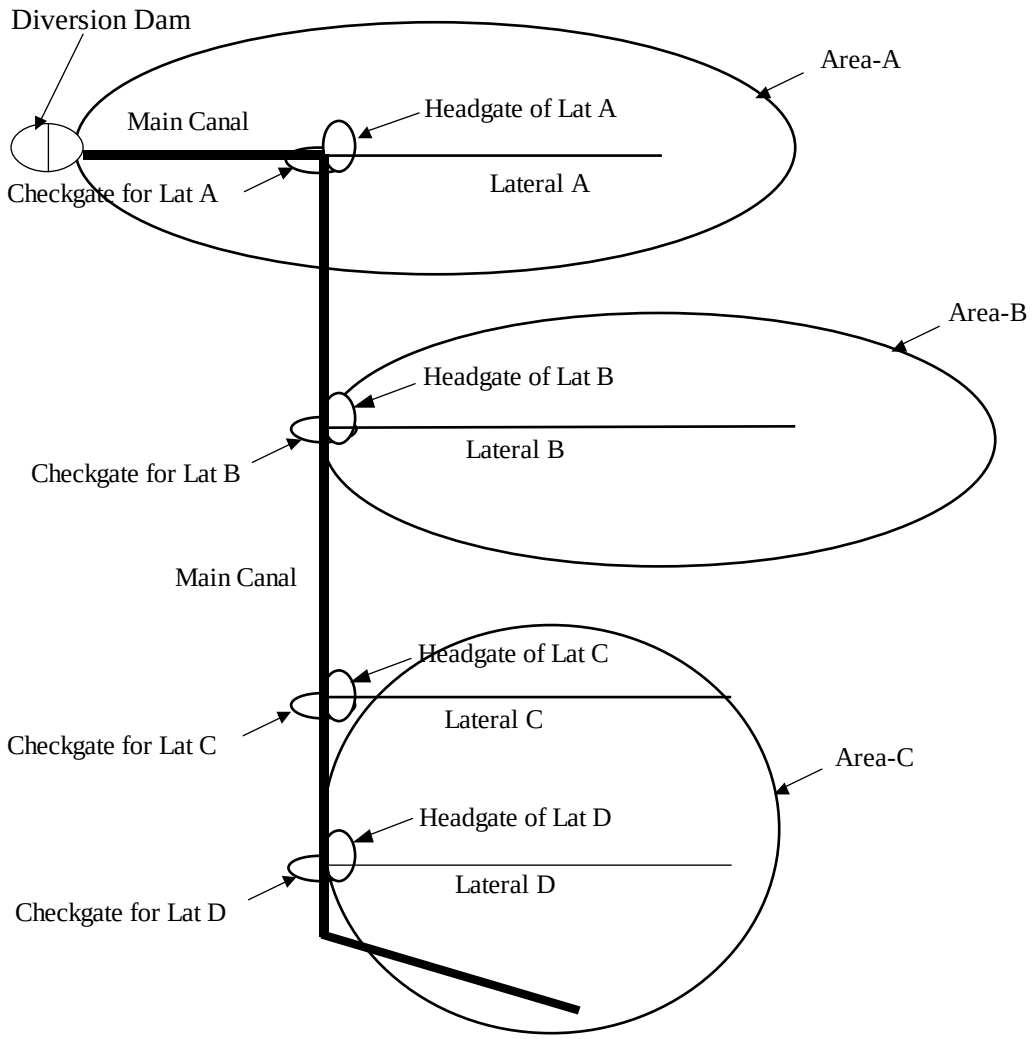


Figure I.2 Cropping Calendar and Schematic Layout for Gate Operation

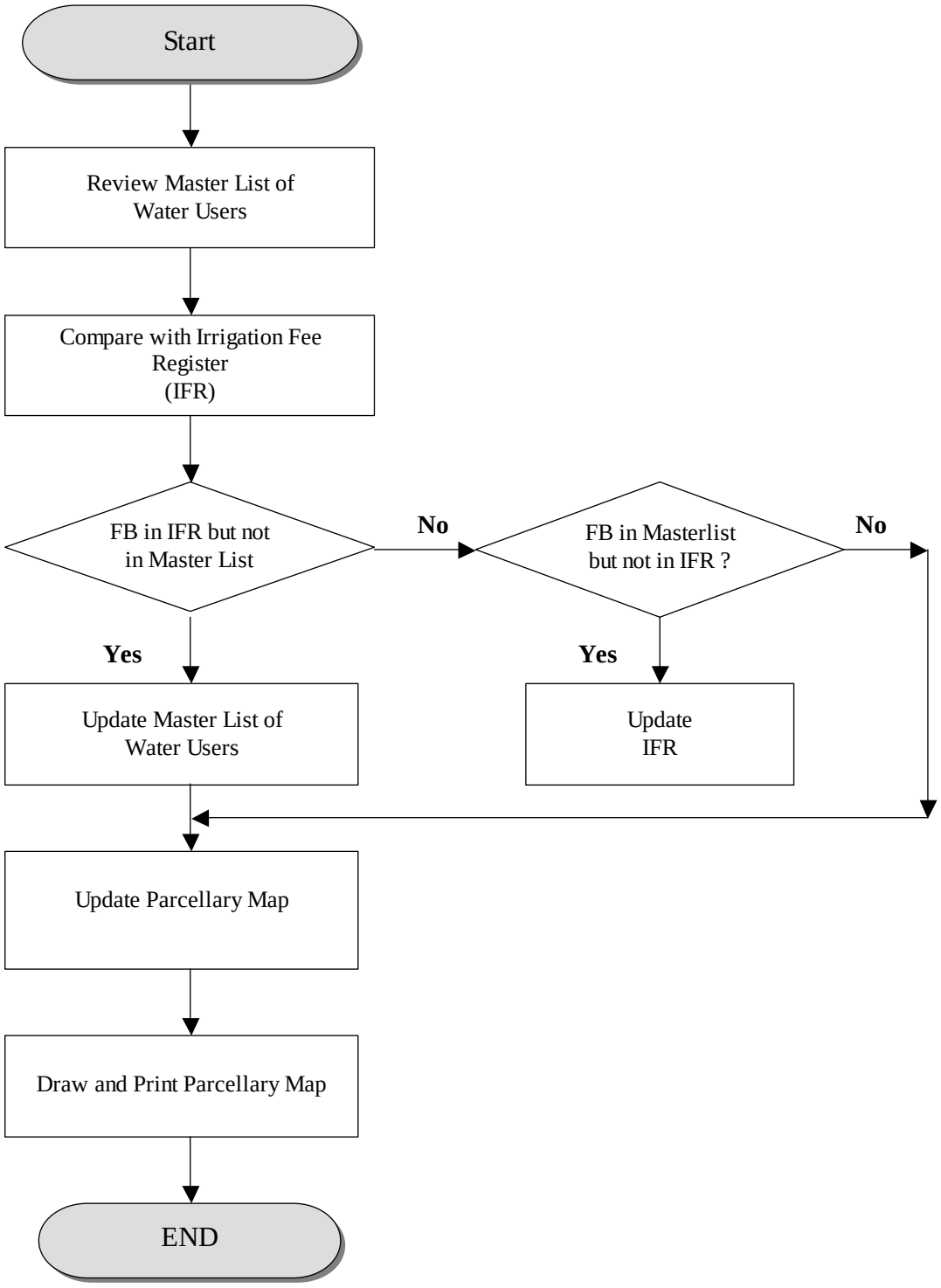


Figure I.3 Flowchart for the Updating of Database and Parcellary Maps

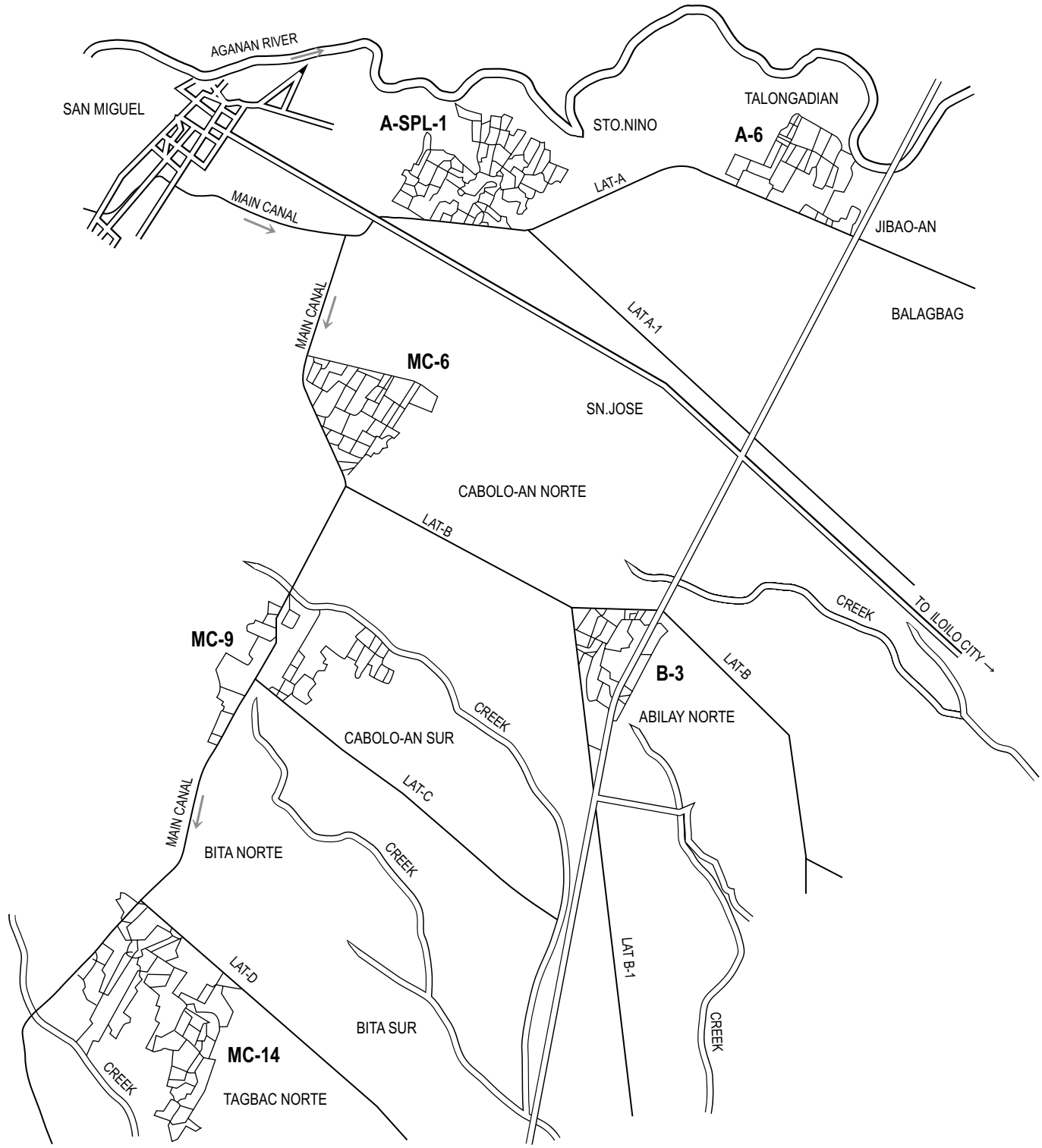


Figure I.4 Location of Sample Turnout Service Areas in Aganan RIS

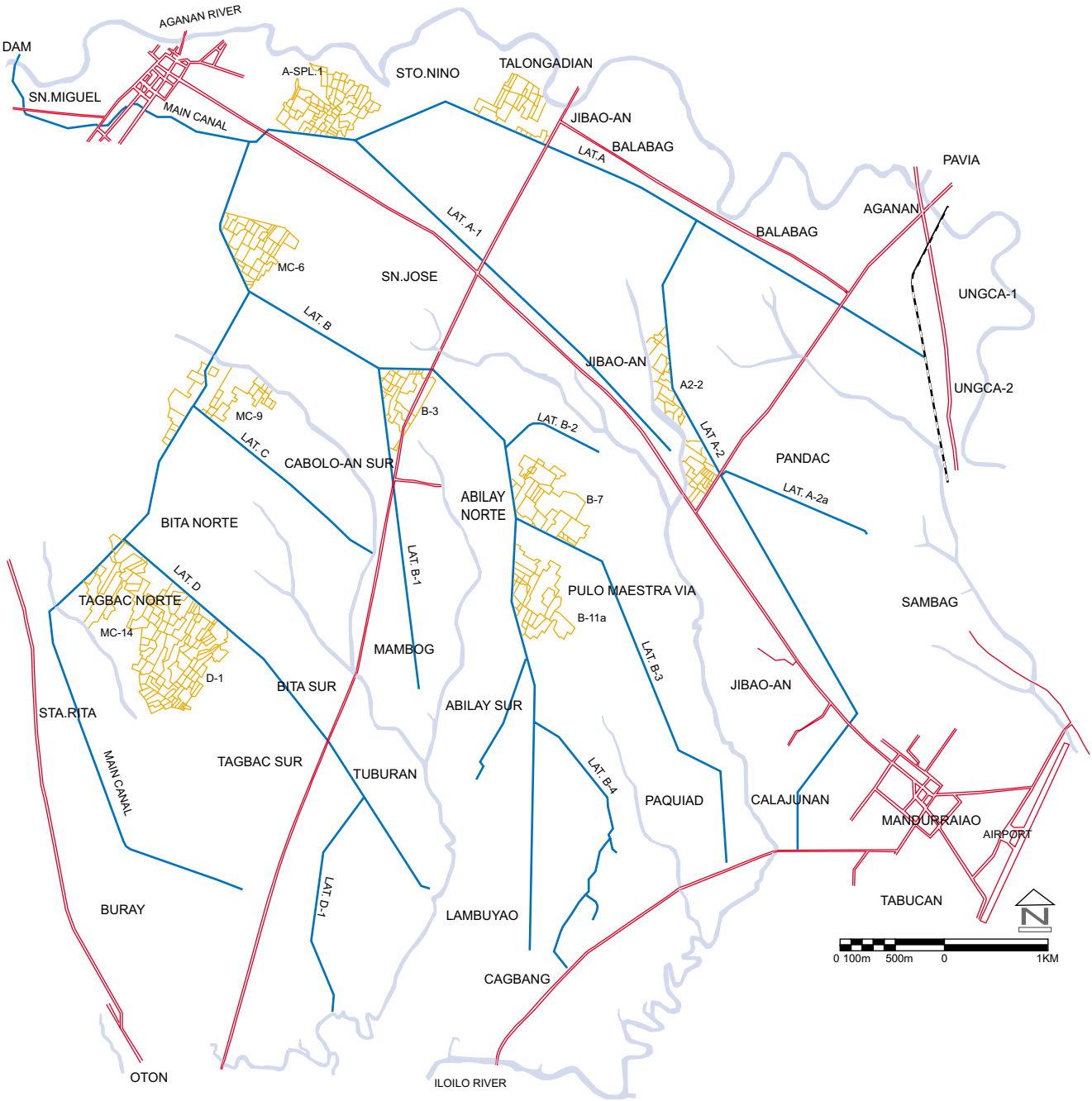


Figure I.5 Location of Sample Turnout Service Areas (Validation Survey) in Aganan RIS

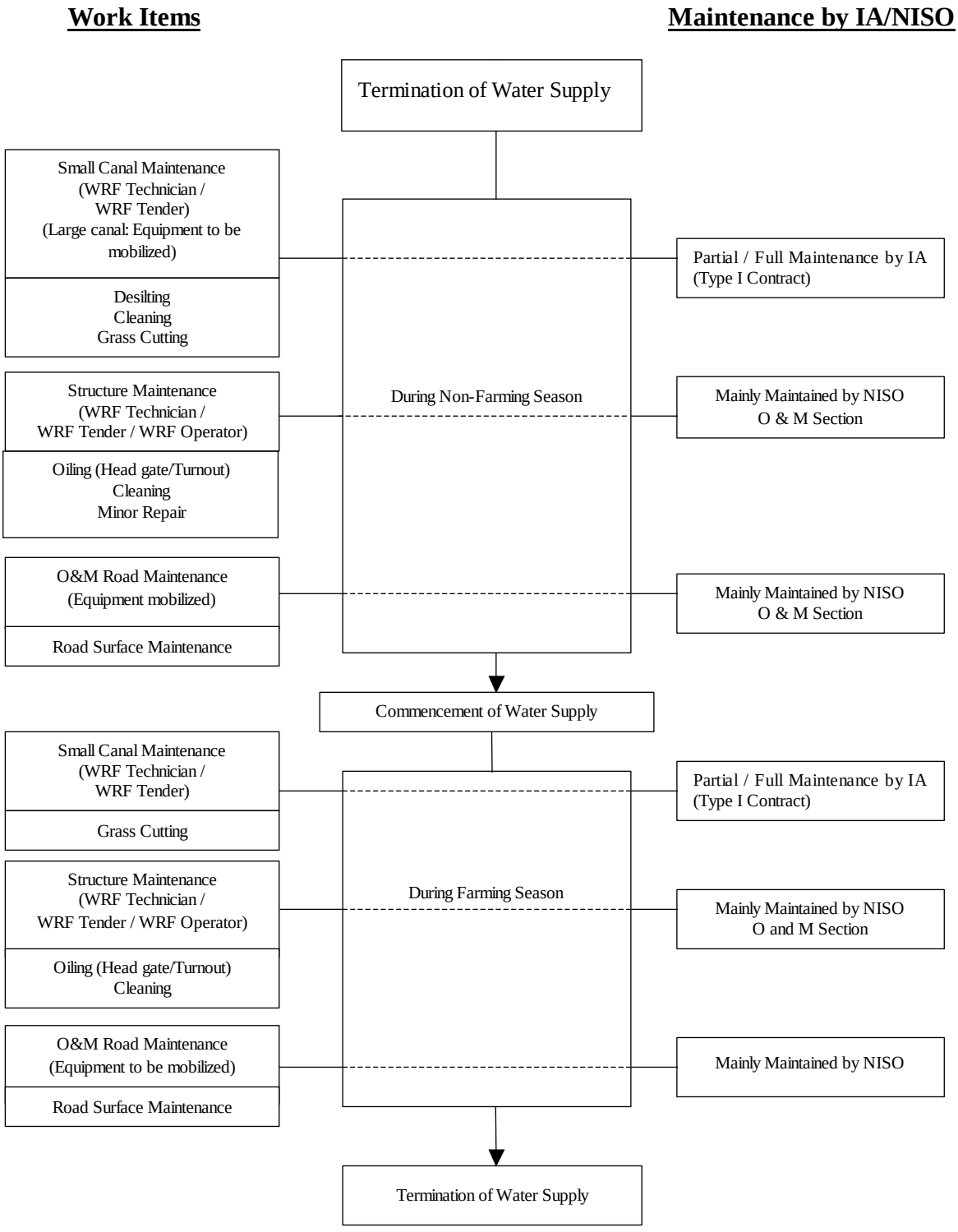


Figure I.6 Maintenance Activities of NISO

APPENDIX II

IRRIGATION INVENTORY AND GIS DATA BASE

APPENDIX – CHAPTER II

IRRIGATION INVENTORY AND GIS DATABASE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

CHAPTER II IRRIGATION INVENTORY AND GIS DATABASE

1. General

The study on irrigation inventory and GIS database was carried out from September 2000 to August 2001.

In this study, the irrigation inventory of NIA was clarified and supplemental inventory survey was conducted to update the data on the existing irrigation systems for all NISs and a part of CISs. Through the analysis of the existing data and the results of the supplemental inventory survey, irrigation inventory for the NISs, the selected CISs and NIPs was prepared and stored in the GIS database established in this Study as a computerized database to facilitate effective utilization.

The GIS database was established at two levels that are 1:50,000-scale map level and 1:4,000-scale map level. The 1:50,000-scale map level GIS database can facilitate planning irrigation development projects and monitoring on irrigation systems. The 1:4,000-scale map level (parcellary map level) GIS database can facilitate monitoring on ISF collection and water management activities at National Irrigation System Office (NISO).

The results of the study on irrigation inventory and GIS database are presented below.

2. NIA Irrigation Systems

The Irrigation Systems related to NIA consists of three types of systems as follows:

1) National Irrigation System (NIS)
2) Communal Irrigation System (CIS)
3) Private Irrigation System (PIS)

The NIS is irrigation system planned, constructed, operated and maintained by NIA. The NIS is under the responsibility of the NIA, which cover the service areas generally over 1,000 ha. All NISs are managed by Irrigation Superintendents (IS) with their respective staff. NIA collects Irrigation Service Fees (ISF) from beneficiaries served by the NISs. List of all NISs is shown in Table II.1. Major particulars of the NISs are as follows:

Number of NISs		: 195	
Number of responsible centers		: 106	
(National Irrigation System Offices: NISOs)			
Total service area of NISs		: 678,549 ha	
Irrigated area:	Wet season	: 491,599 ha	(72%)
	Dry season	: 452,766 ha	(67%)
	Total	: 944,365 ha	(139%)

Data source: SMD and CORPLAN (as of end of 1999)

The CIS is irrigation system owned, operated and maintained by Irrigators' Associations (IAs). The CIS is under the responsibility of the beneficiaries through IAs, the service areas of which are generally below 1,000 ha. After the project is completed by NIA, the whole system is turned over to the IAs, which are given a set of training programs for the operation and

maintenance of the system. The beneficiaries are required to amortize for the chargeable construction cost of the CIS. Major particulars of the CISs are as follows:

Number of CISs		: 6,692	
Number of responsible centers (Provincial Irrigation Offices: PIOs)		: 67	
Total service area of CISs		: 486,067 ha	
Irrigated area:	Wet season	: 273,245 ha	(56%)
	Dry season	: 175,652 ha	(36%)
	Total	: 448,897 ha	(92%)

Data source: CORPLAN (as of end of 1999)

The PIS cover a service area of about 174,000ha in total. The PIS as defined in Memorandum Circular (MC) No. 78, s. 1990 are constructed, operated and maintained by private individuals or groups, with or without technical assistance by NIA or other government agencies.

3. Irrigation Inventory of NIA

(1) Available Irrigation Inventory for NIS

The irrigation inventories for all the NISs are maintained by the Systems Management Department (SMD) of NIA Central Office (CO). The major irrigation inventories being maintained by SMD are as follows:

1) Accomplishment Report (Performance Evaluation Report)

"Accomplishment Report (Performance Evaluation Report)" is prepared by NISO to evaluate performance of each NISO annually.

The items of this report are as follows:

a. No. of Personnel
b. Irrigation Service Area (ha)
c. Irrigated Area by cropping season (ha)
d. Benefited Area by cropping season (ha)
e. Billed Area by cropping season (ha)
f. Averaged Yield by Cropping Season (cavans/ha)
g. Expenses (Pesos)
h. Income (Pesos)
i. Cropping Intensity (%)
j. ISF Collection Efficiency (%)
k. Viability Index (Total Actual Income / Total Actual Expenses)
l. O&M Cost/ha (Total Actual Expenses / Service Area) (Pesos/ha)

This is prepared by each NISO and submitted to the Regional Irrigation Office (RIO) for review and compilation. The RIO submits it to the SMD on or before May 15, every year.

2) Repair/Rehabilitation Status (Physical and Financial Progress)

"Repair/Rehabilitation Status" is prepared for all NISs to monitor physical and financial progress executed by either force account or contract works, keeping track of actual quantity of work accomplished and actual cost of all items/ activities against the approved estimated cost.

Types of work mentioned in this report are as follows:

a. Repair/Rehabilitation of Existing Irrigation System Facilities
b. Repair/Rehabilitation for the Improvement of Drainage & Flood Protection Works
c. Repair/Rehabilitation of Farm to Market Roads
d. Repair/Rehabilitation of Maintenance and Other Operating Expenses (MOOE)
e. Repair/Rehabilitation of Incremental O&M

This report is prepared by each NISO monthly and submitted to the RIO for compilation. The RIO submits it to the SMD on or before the 10th day of the succeeding month. SMD compiles these data for the annual report.

"Status of Service & Irrigated Area" is updated annually by the Corporate Planning Staff Office (CORPLAN) of NIA CO as the inventory for all irrigation systems both for NIS and CIS. This includes the following items:

a. Irrigation Service Area (ha)
b. Irrigated Area by Cropping Season (ha)

(2) Available Irrigation Inventory for CIS

The irrigation inventory database for 2,423 CISs (351,769 ha) and 1,466 CIPs (211,809 ha) was prepared in the Master Plan Study on the Small-scale Irrigation Development Project (SSIDP/JICA) in 1992. This inventory was not updated after the above study, and no department/office were maintaining this database. The inventory database of SSIDP is being utilized for the feasibility study of Communal Irrigation Development Project (CIDP) II (1992-2000) & III (2001-2008), NIA and Agrarian Reform Infrastructure Support Project (ARISP) I (1996-2002) & II (2000-2005), DAR.

"Provincial Irrigation Profile" prepared for all provinces by NIA in 1989 is also one of the irrigation inventories. The Provincial Irrigation Profile includes all types of irrigation systems and projects, i.e., NIS, NIP, CIS, CIP and private irrigation systems/projects. NIA has intention to update Provincial Irrigation Profile in near future.

At present, Corporate Planning Staff Office (CORPLAN) of NIA CO is the responsible office for the maintenance of the inventory for all CISs. This inventory is prepared annually based on monthly reports submitted by each PIO and includes the following items:

a. Irrigation Service Area (ha)
b. Irrigated Area by Cropping Season (ha)
c. Averaged Yield by Cropping Season (cavans/ha)
d. Date of Turned over to IA
e. Total Project Cost (Pesos)
f. Amortization Status (IA Loan)
g. Operation Status (Operational / Non operational)

As a result of review of NIA's existing irrigation inventory, some data on the existing irrigation systems are not updated regularly and these data are not integrated for effective utilization. In such situation, supplemental inventory survey was conducted to update the related data and integrated inventory database are prepared in this Study in order to facilitate effective utilization of irrigation inventory.

The contents of the supplemental inventory survey conducted in this Study are mentioned in the following section.

4. Supplemental Inventory Survey

4.1 Objective of Supplemental Inventory Survey

The supplemental inventory survey aims to update the data on the existing irrigation systems for all NISs and a part of CISs. The data and information obtained from the inventory survey are stored in the GIS database prepared in this Study. The inventory database for all NISs will be utilized for monitoring the activities/services and for planning irrigation development projects. The inventory database for the selected CISs will be a model to prepare the inventory database of all CISs by NIA in the future.

The inventory database of NISs was established in this Study. In addition, data for NIPs to be implemented up to 2004 was collected and stored in the GIS database.

4.2 Objective Irrigation Systems

The inventory of the objective irrigation systems was prepared in this Study. They consist of the following:

1) All the existing NISs and NIPs to be implemented up to 2004.
2) Selected CISs with the total irrigation service areas of about 1,000 ha.

The number and irrigation service area of objective NISs and NIPs are as follows:

No. and Irrigation Service Area of Objective NIS and NIP

System / Project		No. of Systems / Projects	Total Irrigation Service Area (ha)
NIS		195	678,549
NIP	Recently Completed and On-Going NIP	17	170,160
	Proposed NIP to be Implemented up to 2004	25	93,651
	Sub-Total (NIP)	42	263,811
Total (NIS & NIP)		237	942,360

Source: CORPLAN, SMD and JICA Study Team

Lists of objective NISs and NIPs are shown in Tables II.1 and II.2 respectively.

Selection of the objective CISs was made based on the following criteria:

1) Objective CISs are located in the same provinces as the model office and the replication offices exist.
2) Objective CISs have major types of intake facilities such as diversion dam, check gate, impounding dam and pump.

Using this criteria and under consultation with NIA, CISs to be included in the irrigation inventory were finally selected from the three main islands such as Luzon (Region 3), Visayas (Region 6) and Mindanao (Region 11) as follows. Total irrigation service area of the selected CISs is about 1,000 ha.

Selected CIS included in Irrigation Inventory

Region	Name of CIS	Type of Intake Facilities	Name of PIO	City/ Municipality	Service Area (ha)
Region 3	Malimanga Sinabacan CIS	Check Gate	Zambales PIMO	Candelaria	200
	Cabangan CIS	Diversion Dam Pump-Well	Zambales PIMO	Cabangan	83
	Palayan CIS	Pump-River	Nueva Ecija PIMO	Palayan City	120
Region 6	Alapasco CIS	Impounding Dam	Iloilo PIO	Batad	442
Region 11	Upper Tuganay CIS	Diversion Dam	Davao del Norte PIO	Sto. Tomas	250
Total					1,095

Source: CORPLAN and JICA Study Team

4.3 Results of Supplemental Inventory Survey

(1) Survey Items

After review of NIA's existing irrigation inventory and discussion with NIA personnel, survey items for the supplemental inventory survey were determined as follows:

1) General
2) Engineering
   a. Topography, Soils & Land Classification
   b. Water Source
   c. Irrigation Water
   d. Irrigation Facilities
   e. Drainage Facilities
   f. Drainage and Flood Condition
   g. Service & Access Roads
   h. Construction Costs at Time of Completion
   i. Water management and Operation & Maintenance (O&M)
3) Office Facilities and Equipment in the Responsible Office
4) Agriculture and Agro-Economy
   a. Socio-Economic Background
   b. Cultivation Area
   c. Crop Production
   d. Production Cost
   e. Farmer's Income
5) Environmental Issues

(2) Survey Method

The supplemental inventory survey was conducted in the following steps:

1) Preparation of Questionnaires

Questionnaires were prepared for the supplemental inventory survey for NIS, NIP and CIS respectively in consultation with the NIA personnel.

2) Distribution of Questionnaires

The questionnaires for NIS and CIS were distributed to each National Irrigation System Office (NISO) and selected Provincial Irrigation Offices (PIOs) through the related Regional Irrigation Office (RIO). The questionnaires for NIP were distributed to each National Irrigation Project Office and the related department such as Project Development Department (PDD) and Construction Management Department (CMD).

3) Collection of Answered Questionnaires and Related Materials

Answered questionnaires and materials such as reviewed Performance Evaluation Report for each NIS, updated General Layout Map (Irrigation System Map) and updated Equipment Inventory were collected from each NISO, selected PIOs, National Irrigation Project Offices and the related department. The surveyors visited the RIO, NISO, PIO and the related offices to monitor the progress.

(3) Results of Survey

The inventory survey was conducted by the Study Team in cooperation with NIA with expectation that the answered questionnaires and related materials would be collected by the end of December 2000. However, the survey was finally completed in the middle of February 2001. The answered questionnaires and related materials were collected with the following collection ratio.

Results of Data Collection for Irrigation Inventory

System / Project	Description	Answered Questionnaire	General Layout Map	Performance Evaluation Report
NIS	Target	195	195	195
	Collected	185	195	177
	Collection Ratio	95%	100%	91%
NIP	Target	42	42	-
	Collected	39	39	-
	Collection Ratio	93%	93%	-
CIS	Target	5	-	-
	Collected	5	-	-
	Collection Ratio	100%	-	-

Source: JICA Study Team

Through the analysis of the existing data and the results of the inventory survey, irrigation inventory was prepared for the NISs, the selected CISs and NIPs as a computerized database. The database for the NIS, NIP and CIS was stored in the GIS database established in this Study.

Major items of the irrigation inventory for NIS, NIP and CIS are shown in Table II.3.

5. GIS Database Established

GIS database is necessary in NIA for efficient management of its irrigation Systems and Resources. Each irrigation system is a spatially distributed entity. Regional analysis requiring laborious interpretation of many maps can be computerized using GIS. Thus, GIS database is important for NIA and was established as part of this Study.

GIS was introduced in NIA through a grant from JICA and is operational from late 1999 at the Project Development Department of NIA CO. Because of this, hardware and software facility is now available to aid in developing spatially referenced geographic data. NIA already has made a modest effort in preparing geographically referenced digital data of National Irrigation Systems (NIS) and Communal Irrigation Systems (CIS) at a scale of 1:250,000, demonstrating the capabilty to sustain GIS. A typical complete GIS requires hardware, software, data and procedures designed to support, management, manipulation, analysis, modeling and display of geographically referenced data for solving complex planning and management problems. The GIS database established in this Study will complement NIA's GIS efforts and aid in its planning and management tasks.

5.1 Objectives of GIS Database and Objective Irrigation Systems

(1) Objectives of GIS Database

NIA requires GIS Database at two levels – (a) at the macro level for overall planning and monitoring on irrigation systems, and (b) at the parcellary map level for efficient operation of National Irrigation System Office (NISO). Both systems were planned and established in this Study.

1) Macro Level GIS Database (1:50,000 GIS Database)

NIA requires a macro-level GIS database for organizing new irrigation projects and for assembling vital management information. New irrigation systems are being planned and implemented regularly. Topographic and irrigation related geographical information are necessary for selecting the appropriate locations, for determining the water availability, determining the service area, and for designing the system. In addition, it is also necessary to monitor existing irrigation systems. However, such information is not available in an integrated way presently.

The macro level GIS database (1:50,000-scale map / hereinafter referred to as "System-A") contains the basic information on all the 195 NISs and 42 NIPs to be implemented up to 2004, in addition to 1:50,000 scale resolution topographic and irrigation related information. It is anticipated that this GIS database will provide the much-needed basic data for improved irrigation systems planning, monitoring and evaluation.

2) Parcellary Map Level GIS database (1:4,000 GIS Database)

The parcellary map level GIS database (1:4,000-scale map / hereinafter referred to as "System-B") was also established for about 1,000ha area. The purpose of this system is to demonstrate utilization of computerized parcellary maps for monitoring on ISF collection and water management activities.

NIA recognized the need for parcellary maps and an effort was undertaken to update the parcellary maps through Irrigation Operations Support Project I (IOSP I). Manual procedures were initiated for utilization of the parcellary map for ISF monitoring activity in 1991 (Memorandum Circular No. 71, titled "General Guidelines and Procedure for Utilization of the Parcellary Maps", Dated 1991). However, in spite of these efforts, parcellary maps are sparingly used in ISF monitoring and water management. Especially in the case of large irrigation systems, it is difficult to use the parcellary maps because of the large number of maps to be involved. Further, manual utilization of parcellary maps for monitoring activities has many problems. Parcellary-level GIS database will be very useful to maintain and utilize the parcellary map for monitoring of ISF collection and water management activities.

(2) Objective Site for Parcellary Map Level GIS Database

Upper Pampanga River Integrated Irrigation System (UPRIIS) District III-Zone I-Division C was selected as the objective site for the 1:4,000 GIS database. Division C represents an area of 1,293 ha with 5 Irrigators' Associations (IAs). The selected site has 1 lateral canal and 7 sub-lateral canals. There are 711 farm lots in this area. The whole UPRIIS District III has an area of about 30,000 ha with about 20,000 farmers.

It is expected that NIA will be able to digitize parcellary maps of other areas using the facilities that are currently available in NIA and the expertise provided by the Study Team.

(3) Basic Specifications for the two GIS Database Systems

The concepts of the two GIS database systems are summarized as schematic diagrams in Figures I.1 and I.2 respectively. In addition to developing a conceptual framework for the GIS database, emphasis was placed on developing a GIS that would add value, integrate smoothly with the NIA's current resources/capability and provide an easy path for future expansion. Based on these guidelines, detailed design of GIS database and development were undertaken. NIA currently owns GIS software developed by Environmental System Research Institute Inc. (ESRI). For this reason, the data and the customization was made using ArcView GIS, which is a product of ESRI. Further, Microsoft's MS-Excel and MS-Access software was used. The system was developed in such a way that modifications can be carried out by NIA's technical staff.

The main features of the two GIS database systems are briefly highlighted in the following sections from two perspectives, namely the GIS data perspective and the customization. The operation and maintenance plan for integration of the GIS database system within NIA is mentioned separately in a later section.

5.2 Main Features of 1:50,000 GIS Database

(1) Data for 1:50,000 GIS Database

The main source of information for geographic features are General Layout maps of NISs and NIPs and the 1:50,000 topographic map available from National Mapping and Resources Information Authority (NAMRIA). Detail of all the geographic features that was digitized is summarized in the table below.

Geographic Features of 1:50,000 GIS Database

From General Layout Maps: NIS service area (polygon), Division (polygon), Road network (line), Irrigation Canal (line), Drainage Canal (line), NISO (point), PIO (point), RIO (point) and CO (point) locations, All major Irrigation Structures that are visible in a general layout map, such as, Head gate, Turnout, Check structure, Siphon, Aqueduct, Bridge, Spillway, Waste way, Diversion dam, Impounding dam, Reservoir dam and Pump.
From Topographic Maps: Regional boundaries (line), Provincial boundaries (line), Road (line), Water surface (polygon), Shoreline (line), Built-up area (polygon), Meteorological station (point), Elevation contour (polygon), Spot elevation (point) and Land cover (polygon).

The GIS contains data digitized from the topographic maps and General Layout maps of 195 NISs. All the NIPs to be implemented up to 2004 were also included in the GIS database. The data collection for these data is as shown in the table below:

Collection of Map Information for 1:50,000 GIS Database

Data Description	Information Source
General Layout Maps	NIA
1:50,000 Topographic Maps	NAMRIA
Locations of NISO, RIO, PIO and CO	NIA
Locations of Meteorological Stations	PAGASA

In addition, tabular data pertaining to irrigation system profiles, staffing, accomplishment, Irrigators' Association (IA), equipment inventory, current operating budget, annual income & expense information corresponding to each NISO was also collected and encoded for incorporation in the GIS database as attribute tabular information. The data collection for these data is as shown in the table below:

Collection of Attribute Tabular Information for 1:50,000 GIS Database

Data Description	Information Source
System Profile for NIS	SMD & Inventory Survey
Annual Accomplishment for NIS (Performance Evaluation Report) (Current & Past data)	SMD & Inventory Survey
Repair/Rehabilitation Status for NIS	SMD
IA list for NIS	IDD
Photographs for NIS and NIP	NIA
Staffing Information for NISO, RIO and CO	Personnel Dept.
Equipment Inventory for NISO and NIP Office	EMD & NISO
Current Operating Budget for NISO, RIO and CO	Regional Offices
Annual Actual Income & Expense for NISO, RIO and CO	Finance Dept.
Other Related Information for NIS and NIP	Inventory Survey
PAGASA Rainfall Data	PAGASA

(2) Customization for 1:50,000 GIS Database

The GIS database will be used by the NIA staff. In addition, some staff are not familiar with GIS. For this reason, some of the functionalities available in GIS were customized to make easy system for users. In the GIS database, using the digital map as interface, it is possible to query relevant irrigation features and obtain information that are stored with that feature.

The type of output and the schematic flowchart of the user interface are summarized in Figure II.3. Initially, a map of whole Philippines (or a region when used at regional level) is displayed and has facility to zoom in and zoom out to various map resolution levels. GIS database was customized in such a way that by clicking on the displayed NIS, information and reports pertinent to that NIS can be retrieved and displayed. Similarly, if a NISO or a RIO or a CO is clicked, then the information of all the NIS, belonging to that office can be retrieved and displayed, either in summarized form or in a detailed form. The sample templates for output and sample maps to be obtained from the 1:50,000 GIS database is summarized in Attachment II.1.

Calculation functions for reservoir volume and water surface area of proposed reservoir will be useful for irrigation system planning purposes. The proposed system has an automated provision to display the reservoir water surface area in 2D and display of the calculated reservoir volume and water surface area.

The GIS database is equipped with an open architecture so further customization and improvement can be undertaken at a later stage.

Users have experience using computers, but have no experience to GIS software. To ensure the smooth operation and sustainable utilization of the established GIS database, an Operation and Maintenance Manual was prepared in addition to its software customization.

5.3 Main Features of 1:4,000 GIS Database

(1) Data for 1:4,000 GIS Database

For the UPRIIS District III-Zone I-Division C, which was selected as the objective site for 1:4,000 GIS database, topographic maps (1:4,000-scale) prepared in 1971 and parcellary maps prepared in 1991 were available. These maps were used as the basis to digitize the geographic data. Table below summarizes the geographic features that were incorporated in the GIS database.

Geographic Features of 1:4,000 GIS Database

From Parcellary Maps: Farm lots (polygon), Turnout service area boundaries (polygon), Irrigation Division Boundaries (polygon), Irrigators' Association Boundaries (polygon), Irrigation System Boundary (polygon), Potentially flooded/potentially submerged Area (polygon), Service road within NIS (line), Irrigation canal (line), Drainage canal (line), Head gate (point), Turnout (point), Check structure (point), Siphon (point), Aqueduct (point), Bridge (point), Spillway (point), Waste way (point), Diversion dam (point), Impounding dam (point), Reservoir dam (point), Pump (point) and locations of NISO (polygon) and RIO (polygon).
From Topographic Maps: Roads/Rails centerline (line), Water surfaces (polygon), Built-up area (polygon), Contours (line), Spot elevation (point) and Land cover (polygon).

Irrigation system, irrigation division boundaries, Irrigators' Association boundaries, turnout service area boundaries and farm lot features are all polygons and represent the administrative divisions of an irrigation system. Farm lot is the smallest unit owned/leased by a farmer and being cultivated. Zone I, Division C has 5 Irrigators' Associations, 44 turnout service areas and 711 farm lots.

For the monitoring of the ISF related activities, essentially two documents below are required:

1) Parcellary map indicating each farm lot, and
2) Irrigation Fee Register (IFR)

Every farm lot must have one IFR, wherein the details of the farmer, the service area, amount billed, amount collected and amount exempted for each cropping season will be entered and maintained. A unique "NIA lot number" is used to identify each farm lot. However, in the case of the UPRIIS District III, it was identified that the documents do not accurately reflect the actual farm lots or their accounts. The parcellary map does not use NIA lot number to uniquely link each farm lot to the IFR. Instead, farmer's name had been used. The parcellary map had not been kept up to date since the time of its preparation in 1991. As the situation has changed considerably, it was difficult to identify which farm lot belongs to which farmer. Also, it is possible that the shapes of the farm lots have changed.

To rectify, it will require a detailed aerial and physical survey. Considering the stage of the Study, such a detailed investigation was beyond the scope of the Study. As a result, walk-through and ocular inspections were undertaken along with meeting the IA presidents and relevant farm lot's farmers to obtain the current details. Through this laborious works, the reconciliation of the parcellary map with the actual physical state and the reconciliation of the IFR were undertaken. The following changes were made:

1) There had been many farm lot sub-divisions, sale of farm lots or change of ownerships. Sub-divisions were reflected on the parcellary map. All the farm lots were updated with the current farmer's information.

2) The shape of many farm lots changed because of the land conversion. In most cases, some parts of the farm lot are now used for residential purposes. For these farm lots, the current effective area was obtained from the farmers/IA presidents and the parcellary map was updated.

3) All the farm lots on the parcellary map were identified with an unique NIA lot number. The farmer's name, the NIA lot number and the turnout service area were also reconciled with the IFR. Wherever there was no IFR, new IFRs were prepared. It was ensured that there was one IFR for every farm lot.

4) The area reported on the IFR for many farm lots were not accurate. These IFRs were investigated and reconciled.

5) Few farm lots (4 farm lots) were not present on the parcellary map. These farm lots were updated.

6) Some farm lots have been converted to fishponds. Fishponds are not documented in the parcellary map or ISF is charged for the water supplied to fishponds. Fishponds were incorporated in the parcellary map.

The updating of the parcellary map was completed. As a result of the parcellary map updating, the changes that were made are quantified in the table below:

Update of Parcellary Map for 1:4,000 GIS Database

Description	Details of changes
1. Number of farm lots (No.)	Increased from 631 to 711
2. Service area (ha)	Increased from 1,189 ha to 1,293 ha
3. Number of New IFR prepared (No.)	63 New IFRs
4. Number of New farm lots identified (No.)	4 New farm lots
5. Modification of IA Boundaries	2 IAs. The boundaries of San Gregory Soledad and Pitong-Gatang do not match the other 3 IAs. This was rectified.
6. Number of Farm lots with corrected farmer names (No.)	About 250 farm lots

Source: JICA Study Team

Ideally, it will be useful if the official record is maintained to substantiate a farmer's ownership or lease arrangement with the farm lot he is cultivating as well as each farm lot's cadastral number assigned by the Bureau of Lands. UPRIIS District III office did not maintain this data.

With regard to the water management, the canal system, the drainage system and the locations of various irrigation structures were updated. The boundaries of the turnout service areas, which are already present in the parcellary map, were reconfirmed.

The data collection for the 1:4,000 GIS database is summarized briefly in the table below:

Data Collection for 1:4,000 GIS Database

Data Description	Information Source
Parcellary map and reconciliation with IFR	UPRIIS District III
1:4,000 scale Topographic map	UPRIIS District III
Master List (Water Users List)	UPRIIS District III
IFR Data	UPRIIS District III
ISF Collection Data	UPRIIS District III

(2) Customization for 1:4,000 GIS Database

The main concentration for customization is in ISF collection, water management, parcellary map editing and repair/rehabilitation of irrigation system facilities. Using the GIS database, it is planned to monitor every farmer and every farm lot. The type of output and the schematic flowchart of the user interface are summarized briefly in Figure II.4. The sample templates for output and sample maps to be obtained from the 1:4,000 GIS database is summarized in Attachment II.2.

Through customization, the following functions for ISF collection can be facilitated:

1) Display/print the profile, the current account and the past account transactions (back account) of a farmer/farm lot.
2) Display/print uncollected ISF records and view their corresponding farm lots/farmer interactively.

3) Display/print the historical records of areas planted and billed, and payment received for a farmer/farm lot.
4) Map query, map display and report.

Like ISF collection activities, a simple provision to update data, query, display and report is required for water management also. For the GIS database, information such as turnout service area and cropping calendar are required for the planning of the water delivery and distribution schedule. Discharge of head gate and turnout needs to be recorded for monitoring of water delivery and distribution.

The main outputs that are produced from the GIS database for water management are as follows:

1) Cropping Calendar showing the timing for land soaking, land preparation and irrigation shall also be stored in the computer.
2) Programmed Area Map showing the area planned for irrigation for each cropping season.
3) Water Distribution Schedule Map showing the dates on which water will be released to various turnout service areas.
4) Discharge records of water delivery and distribution from each head gate and each turnout respectively.

Users have experience using computers, but have no experience to GIS software. To ensure the smooth operation and sustainable utilization of the established GIS database, an Operation and Maintenance Manual was prepared in addition to its software customization.

6. Organization for Operation and Maintenance of GIS Database

The GIS database hardware and software infrastructure within NIA were installed to materialize the proposed operation and maintenance plan as follows:

GIS database hardware and software installed

		Hardware	Software
NIA CO	CORPLAN	1	1
	PDD	*A	*B
	SMD	1	1
	Sub-Total (NIA CO)	2	2
RIO Level	UPRIIS Head Office	1	1
NISO	UPRIIS District III	1	1
	Total	4	4

Notes: *A: Existing hardware is available.
*B: Existing software is available.

In NIA Central office (CO), one GIS software (ArcView) is currently available in PDD. Additional GIS software with appropriate hardware were provided to CORPLAN and SMD respectively. At the NISO level, GIS software was installed at UPRIIS District III, which the GIS database was prepared through this Study. Further, GIS software with appropriate hardware was provided to the related RIO (UPRIIS) to expand utilization of the GIS database to other NIOs in future.

Upon completion of the Study, the GIS database is transferred to NIA in a CD-ROM along with an operation and maintenance manual. The contents in the CD-ROM can be installed in a computer and activated using ArcView GIS software.

In the proposed organization of NIA, Information Systems Department will hold the overall responsibility for the GIS database. However, in the existing organization, Corporate Planning Staff Office (CORPLAN) will hold the overall responsibility.

Operation and maintenance is necessary to sustain the GIS database. Various geographic and attribute information need to be kept up-to-date in order to utilize the GIS database. The operation and maintenance plan for the GIS database is summarized below.

(1) Operation and Maintenance for 1:50,000 GIS Database

For 1:50,000 GIS database, Corporate Planning Staff Office (CORPLAN) will hold the overall responsibility for the systems utilization and future improvements. Three computers, one each from CORPLAN, Systems Management Department (SMD) and Project Development Department (PDD) will be connected together to establish a local area network. The tabular attribute data will reside in the CORPLAN's computer and will serve as a small server computer. The geographic data will be available in the computer of each department. Any of the three-networked computers will be able to access the GIS database and look into the data.

GIS knowledgeable staff in PDD will directly have access to the GIS database and perform operation and maintenance of geographic feature data. Updating of the geographic feature data will be necessary whenever new systems are established and whenever there is change in the existing data. Currently, the PDD has all the necessary tools for updating geographic feature data. The SMD will undertake updating of the attribute data tables. Responsible departments and frequency of updating to be required for the various information incorporated in the 1:50,000 GIS database is summarized in the table below:

Data Updating for 1:50,000 GIS Database

Description	Data Source	Responsible Dept.	Proposed Frequency of Updating
Geographic Information			
General Layout Maps of Irrigation Systems and Projects	NISO, CMD and PDD	PDD	Annually or as required
Topographic Information	NAMRIA	PDD	Annually or as required
Attribute Information			
System Profile (NIS) Project Profile (NIP)	SMD for NIS CMD for On-going NIP PDD for Proposed NIP	SMD	Annually
Accomplishment Report (Performance Evaluation Report)	SMD	SMD	Annually
Repair / Rehabilitation Status	SMD	SMD	Annually
Irrigators' Association Information	IDD	SMD	Annually or as required
Equipment Inventory	EMD	SMD	Annually or as required
Staffing Information	Personnel Dept.	SMD	Annually
Current Operation Budget (COB)	Finance Dept.	SMD	Annually
Annual Income and Expense	Finance Dept.	SMD	Annually

The Electronic Data Processing (EDP) Section of CORPLAN will undertake network maintenance, user support for proper attribute data encoding and adding new computers to the network system. PDD in coordination with the EDP section will install and maintain the ArcView GIS software on the three computers. At a future date, when improvement and expansion of the GIS is required, PDD will undertake the necessary changes.

(2) Operation and Maintenance for 1:4,000 GIS Database

All aspects of the system were fully customized to ensure easy operation by any user, because the GIS database will be operated at the NISO. The computer will be located in a suitable place within UPRIIS District III office, so both the Engineering section and the Billing section can operate.

Using this GIS database, the NISO can follow up which farm lots have been planted and irrigated, which farm lots have been billed, which farm lots have been exempted and where collection has already been made. However, such information can be obtained from GIS database only if it's kept up to date. Responsible departments/sections and frequency of updating to be required for the various information incorporated in the 1:4,000 GIS database is summarized in the table below:

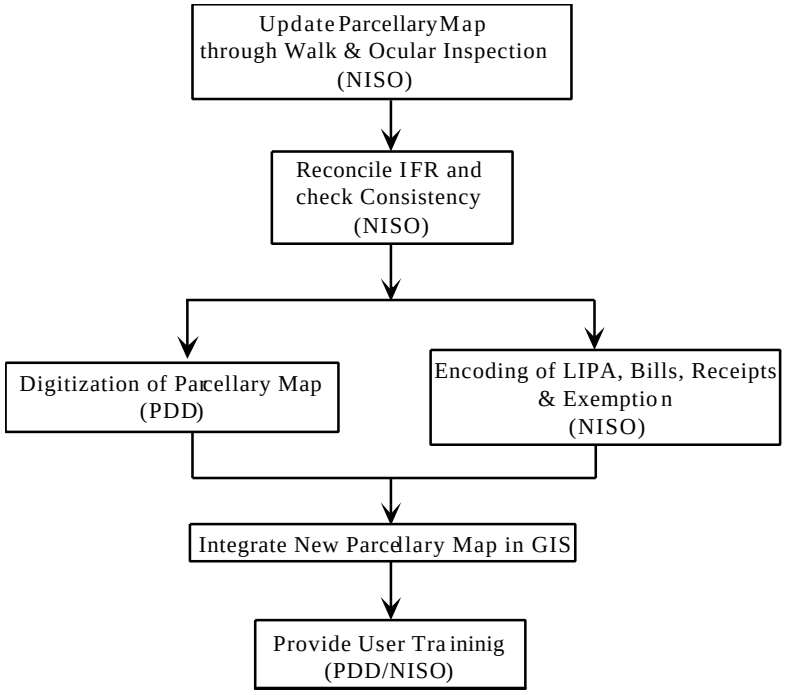
Data Updating for 1:4,000 GIS Database

Description	Data Source	Responsible Dept. / Section	Proposed Frequency of Updating
Geographic Information			
Parcellary Map	Operation Section	PDD	Annually or as required
Facilities Information	Maintenance Section	PDD	Annually or as required
Topographic Information	Operation Section	PDD	Annually or as required
Attribute Information			
Irrigated / Planted Information	LIPA	Operation Section	Every cropping season
Exemption Information	Exemption Report	Billing Section	Every cropping season
ISF Billed Farm Lots Information	ISF Bill	Billing Section	Every cropping season
ISF Collection Information	ISF Receipt	Billing Section	Every cropping season
Water Users Information	IFR	Billing Section	Every cropping season or as required
Water Distribution Schedule	Operation Section	Operation Section	Every cropping season
Discharge Record	Operation Section	Operation Section	Monthly
Repair / Rehabilitation Status	Maintenance Section	Maintenance Section	Annually

GIS database can also provide facility to encode on-going repair/rehabilitation works, programmed irrigation areas, water distribution schedule and discharge records of head gates & turnouts. Operation and maintenance of these will be the responsibility of O&M Section. In addition, O&M Section must also undertake updating of parcellary maps.

For operation and maintenance of the GIS database, the Study Team conducted the training for UPRIIS District III staff. The NIA CO must provide ArcView software maintenance and training/user support for the GIS database on periodic basis. It is recommended that many people be trained in operation and maintenance of the GIS database in each NISO, so that the GIS database can be sustained even if there is a staff movement.

The NISOs do not have the necessary resources and expertise to expand the GIS database to other areas. In addition, it is not economical to develop such resource in the respective NISOs. Therefore, further digitalization of parcellary maps and its integration into the GIS database must be undertaken by the PDD of NIA CO. A flow chart for the preparation of GIS database for other areas is briefly summarized in the figure below.



Flow Chart for Developing 1:4,000 GIS Database in New Areas

7. Training for Operation and Maintenance of GIS Database

Training for operation and maintenance of the GIS database was conducted to the NIA personnel of Central Office (CO) and UPRIIS.

The primary objective of the training was to introduce the application of GIS for ISF monitoring and planning/monitoring for irrigation systems. The focus of the training was to facilitate and sustain the effective utilization of the GIS database after the completion of the Study. The contents of the training were as follows:

1) Introduction to GIS software (ArcView)
2) Operation of the GIS database
   - Process of setting an environment variable
   - System's graphical user interface
   - System's functionalities
3) Maintenance of the GIS database
   - Maintenance of map data and attribute data
   - Access to the forms for data entry
   - Identification of the form elements and its functions
   - Creation, updating, deletion and view of data

The period and objective participants of the training were as follows:

Period and Objective Participants of GIS Training

	Training Period	Objective Participants
Central Office (CO)	June 25 – July 20, 2001 for four (4) weeks	34 staff from PDD, SMD, CORPLAN, EMD, CMD and IDD
UPRIIS	June 25 – July 13, 2001 for three (3) weeks	26 staff from UPRIIS Head Office and District I, II, III & IV

There were four (4) training sessions in CO and three (3) training sessions in UPRIIS, with each session lasting for a week (8 hours a day).

At the end of each training session, evaluation of the training accomplishment was made by way of questionnaire. Results of evaluation are summarized as follows:

Results of Training Evaluation

Description	CO	UPRIIS
1. I acquired many valuable skills.	100%	100%
2. I acquired much valuable information.	100%	100%
3. The content and scope met my expectations.	100%	100%
4. The exercises were very useful for learning.	100%	100%
5. The amount of material covered in the course was just right.	86%	82%
6. Information covered in the class was new to you.	76%	61%

All of the participants responded that they acquired valuable skills and information, and the contents of the training were useful in both CO and UPRIIS. Overall, the training was well received by the participants and was beneficial to NIA. The training for the Central Office and UPRIIS was completed successfully and certificate was distributed to each participant on July 20, 2001 and July 13, 2001, respectively.

As mentioned in the above section, this kind of GIS training for the NIA personnel should be conducted continuously and periodically to sustain and expand utilization of GIS database all over NIA.

TABLES

Table II.1 List of NIS (1/2)

NO.	REGION NIS NO.	REGION	PROVINCE	NISO NO.	NISO	NIS	LOCATION OF NISO
1	1	CAR	Kalinga	1	Upper Chico	Upper Chico	Bulanao, Tabuk
2	1	Region 1	Ilocos Norte	2	Ilocos Norte	Bonga PIS-1	Teodora Alonzo St., Laoag City
3	2					Bonga PIS-2	
4	3					Bonga PIS-3	
5	4					Laoag Vintar	
6	5					Nmc Pasuquin	
7	6					Dingras	
8	7					Bolo	
9	8					Cura	
10	9					Nueva Era	
11	10					Madongan Area	
12	11					Solsona Area	
13	12					Labugaon Area	
14	13					Papa Area	
15	14		Ilocos Sur	3	Ilocos Sur	Sta. Maria-Burgos	Maharlika Highway, Sta. Maria
16	15					Sta. Lucia-Candon	
17	16					Tagudin	
18	17		La Union	4	Amburayan	Amburayan	Sudipen
19	18			5	Masalip	Masalip	San Jose Norte, Agoo
20	19		Pangasinan	6	Agno-Sinocalan	Agno	Bayaoas, Urdaneta City
21	20					Sinocalan	
22	21			7	Ambayoan-Dipalo	Ambayoan	Tayug
23	22					Ambayoan-Extension	
24	23					Dipalo	
25	24			8	Lower Agno	Lower Agno	Tumana, Rosales
26	25			9	San Fabian-Dumuloc	San Fabian	Cayanga, San Fabian
27	26					Dumuloc	
28	1	Region 2	Cagayan	10	Apayao-Abulug-Pamplona	Apayao-Abulug	Ballesteros
29	2					Pamplona	
30	3			11	Baggao	Baggao	San Jose, Baggao
31	4			12	Banurbur Creek	Banurbur Creek	Maddalero, Buguey
32	5			13	Baua	Baua	Sta. Cruz, Gonzaga
33	6			14	Dummun	Dummun	Cabacayan, Gattaran
34	7			15	Iguig-Alcala-Amulung	Iguig-Alcala-Amulung PIS	Amulung
35	8			16	Lower Chico	Lower Chico	Tuao
36	9			17	Magapit	Magapit PIS	Dugo, Camalaniugan
37	10			18	Solana-Pinacanauan	Solana PIS	Solana
38	11					Pinacanauan	
39	12			19	Zinundungan	Zinundungan	Lasam
40	13		Isabela	20	Mallig	Mallig	Mallig
41	14			21	San Pablo Cabagan	San Pablo Cabagan	Cabagan
42	15			22	Tumauini	Tumauini	Tumauini
43	16		Nueva Vizcaya	23	Bagabag	Bagabag	Bagabag
44	1	Region 3	Bataan	24	Colo-Caulaman	Colo	Layac, Dinalupihan
45	2					Caulaman	
46	3		Bulacan	25	Angat-Maasim	Angat	Tambubong, San Rafael
47	4					Maasim	
48	5		Nueva Ecija	26	NEPIS (Nueva Ecija PIS)	NEPIS	Cabanatuan City
49	6		Pampanga	27	Porac-Gumain	Porac	Solib, Floridablanca
50	7					Gumain	
51	8		Tarlac	28	Camiling	Camiling	Malacampa, Camiling
52	9			29	Tasmoris	Tasmoris	Matatalaib, Tarlac
53	10		Zambales	30	Bucao	Bucao	Carael, Botolan
54	11			31	Nayom-Bayto	Nayom	Sta. Cruz
55	12					Bayto	
56	13			32	Sto. Tomas	Sto. Tomas	San Marcelino
57	1	Region 4	Aurora	33	Disalit Creek	Disalit Creek	Poblacion 5, San Luis
58	2		Batangas	34	Palico	Palico	Nasugbu
59	3		Cavite	35	Cavite Friar Lands	Molino	Ibayo Silangan, Naic
60	4					Embarcadero-Baluctot	
61	5					Luksuhin-Makuling	
62	6					Pasong Kastila-Julian	
63	7					Bankud	
64	8					Butas Marcelo	
65	9					Plucena-Bayan	
66	10					Butas-Lawang Bato	
67	11					Navarro	
68	12					Matanda	
69	13					Balayungan	
70	14					Tres Cruses	
71	15					San Agustin-Pasong Buaya	
72	16					Culong-Culong	
73	17					Sahing	
74	18		Laguna	36	Laguna Friar Lands	Cabuyao PIS	Sala, Cabuyao
75	19					San Cristobal	
76	20					Diezmo PIS	
77	21					Macabling	
78	22					San Juan	
79	23			37	Sta. Cruz-Mabacan-Balanac	Sta. Cruz	Pila
80	24					Mabacan	
81	25					Balanac	
82	26					Lumban	
83	27					Malaunod	
84	28			38	Sta. Maria-Mayor	Sta. Maria	Malico, Mabitac
85	29					Mayor	
86	30					Dambo PIS	
87	31		Occidental Mindoro	39	Amnay-Patrick-Mongpong	Amnay-Patrick	San Vicente, Sablayan
88	32					Mongpong	
89	33			40	Caguray	Caguray	Magsaysay
90	34			41	Lumintao	Lumintao	Magsikap, Rizal
91	35			42	Pagbahan	Pagbahan	Sta. Cruz
92	36		Oriental Mindoro	43	Baco Bucayao-Mag-Asawang Tubig	Baco Bucayao	Bayanan II, Calapan
93	37					Mag-Asawang Tubig	
94	38			44	Pula -Bansud	Pula	Pinamalayan
95	39					Bansud	
96	40		Palawan	45	Batang-Batang-Malatgao	Batang-Batang	Narra
97	41					Malatgao	
98	42		Quezon	46	Agos	Agos	Comon, Infanta
99	43			47	Dumacaa-Hanagdong-Lagnas	Dumacaa	Lucena City
100	44					Hanagdong	
101	45					Lagnas	
102	46		Romblon	48	Cantingas	Cantingas	San Fernando, Sibuyan

Source: SMD, NIA

Table II.1 List of NIS (2/2)

NO.	REGION NIS NO.	REGION	PROVINCE	NISO NO.	NISO	NIS	LOCATION OF NISO
103	1	Region 5	Albay	49	Mahaba-Nasisi-Ogsong-Hibiga	Mahaba	Tuburan, Ligao
104	2					Nasisi	
105	3					Ogsong	
106	4					Hibiga	
107	5		Camarines Norte	50	Daet Talisay - Matognon	Daet Talisay	Lag-on, Daet
108	6					Matogdon	
109	7		Camarines Sur	51	Rinconada Integrated	Barit	Sta. Elena, Iriga City
110	8					Rida	
111	9					Buhi-Lalo	
112	10			52	Cagaycay	Cagaycay	Sabang, San Jose
113	11			53	Libmanan Cabusao	Libmanan Cabusao PIS	Libmanan
114	12			54	Tigman-Hinagyanan-Inarihan	Tigman-Hinagyanan	San Roque, Calabanga
115	13					Inarihan	
116	14		Sorsogon	55	Pili-Bulan-San Francisco	San Francisco	San Ramon, Bulan
117	15					San Ramon	
118	1	Region 6	Aklan	56	Aklan-Panakuyan	Aklan	Linabuan Sur, Banga
119	2					Panakuyan	
120	3		Antique	57	Sibalom-San Jose	Sibalom-San Jose	San Jose
121	4		Capiz	58	Mambusao	Mambusao	Mambusao
122	5		Iloilo	59	Aganan-Sta. Barbara	Aganan	Tacas, Jaro, Iloilo City
123	6					Sta. Barbara	
124	7			60	Barotac Viejo	Barotac Viejo	Barotac Viejo
125	8			61	Jalaur-Suague	Jalaur-Proper	Pototan
126	9					Jalaur-Extension	
127	10					Suague	
128	11			62	Sibalom-Tigbauan	Sibalom-Tigbauan	Tigbauan
129	12		Negros Occidental	63	Pangiplan	Pangiplan	Payao, Binalbagan
130	13			64	Bago	Bago	Bago City
131	1	Regions 7	Bohol	65	Bohol	Bohol	Pilar
132	1	Regions 8	Leyte	66	Balire-Ibawon-Gibuga	Balire North	MacArthur
133	2					Balire South	
134	3					Ibawon	
135	4					Gibuga	
136	5			67	Bao	Bao	Valencia, Ormoc City
137	6			68	Binahaan-Tibak	Binahaan North	Calogoc, Tanauan
138	7					Binahaan South	
139	8					Lower Binahaan	
140	9					Tibak	
141	10			69	Bito	Bito	Abuyog
142	11			70	Daguitan-Guinarona	Daguitan	Julita
143	12					Guinarona	
144	13			71	Hindang-Hilongos- Das-Ay	Hindang-Hilongos	Hindang
145	14					Das-Ay	
146	15			72	Mainit-Pongso	Mainit	Alang-alang
147	16					Pongso	
148	1	Region 9	Zamboanga del Sur	73	Dipolo-Salug	Dipolo	Dumingag
149	2					Salug	
150	3			74	Labangan	Labangan	Labangan
151	4			75	Sibuguey Valley	Sibuguey Valley	Bayog
152	1	Region 10	Bukidnon	76	Manupali	Manupali	Valencia
153	2			77	Muleta	Muleta	Maramag
154	3			78	Pulangui-Roxas-Kuya	Pulangui	Valencia
155	4					Roxas-Kuya	
156	1	Region 11	Compostela Valley	79	Batutu	Batutu	Compostela
157	2		Davao del Norte	80	Lasang-Libuganon-Kipaliku	Lasang	Carmen
158	3					Libuganon-Right	
159	4					Kipaliku	
160	5			81	Saug-Libuganon Left	Saug	Buclad, Asuncion
161	6					Libuganon-Left	
162	7		Davao del Sur	82	Mal-Padada	Mal	Hagonoy
163	8					Padada	
164	9		Davao Oriental	83	Lupon	Lupon	Lupon
165	10		Saranggani	84	Siluay-Buayan	Siluay	Siluay, General Santos City
166	11					Buayan	
167	12		South Cotabato	85	Allah-Banga-Marbel	Allah	Koronadal, Surallah
168	13					Banga	
169	14					Marbel-1	
170	15					Marbel-2	
171	1	Region 12	Lanao del Norte	86	Maranding	Maranding	Maranding, Lala
172	2		Maguindanao	87	Alip-Talayan	Alip	Alip, Datu Paglas
173	3					Talayan	
174	4		North Cotabato	88	Kabacan-Pagalungan	Kabacan	Katidtuan, Kabacan
175	5					Pagalungan	
176	6			89	Libungan	Libungan	Villarica, Midsayap
177	7			90	Mlang-Malasila	Mlang	Buayan, Mlang
178	8					Malasila	
179	9		Sultan Kudarat	91	Lambayong-Dumaguil	Lambayong	Lambayong
180	10					Dumaguil	
181	11		Lanao del Sur	92	Rugnan	Rugnan	Taraka, Marawi City
182	1	Region 13	Agusan del Norte	93	Cabadbaran-Taguibo	Cabadbaran-Taguibo	Sanghan, Cabadbaran
183	2		Agusan del Sur	94	Andanan	Andanan	Bayugan I
184	3			95	Gibong	Gibong	Prosperidad
185	4			96	Simulao	Simulao	Trento
186	5		Surigao del Sur	97	Cantillan	Cantillan	Madrid
187	6			98	Tago	Tago	Tabon-Tabon, Tago
188	1	MRIIS	Isabela	99	MRIIS District I	MRIIS District I	Batal, Santiago City
189	2			100	MRIIS District II	MRIIS District II	San Mateo
190	3			101	MRIIS District III	MRIIS District III	San Manuel
191	4			102	MRIIS District IV	MRIIS District IV	Minante, Cauayan
192	1	UPRIIS	Nueva Ecija	103	UPRIIS District I	UPRIIS District I	Munoz
193	2			104	UPRIIS District II	UPRIIS District II	Talavera
194	3			105	UPRIIS District III	UPRIIS District III	Cabanatuan City
195	4			106	UPRIIS District IV	UPRIIS District IV	Gapan

Source: SMD, NIA

Table II.2 List of NIP

National Irrigation Projects (NIPs) (Recently Completed and On-Going NIPs)

No.	Name of Projects	Schedule	Region	Province	Recently Completed Area as of 1999 (ha)	On-Going Area (ha)	Total Target Area (ha)
1	San Roque Multipurpose Irrigation Project	1999-2007	Region 1	Pangasinan	0	23,700	23,700
2	Apayao-Abulug Irrigation Systems Improvement Project	1996-2001	Region 2	Cagayan/ Isabela	0	6,465	6,465
3	Addalam River Irrigation Project	1997-2004	Region 2	Quirino	0	5,830	5,830
4	Pampanga Delta Development Project-IC	1992-2002	Region 3	Pampanga	1,076	6,133	7,209
5	Casecnan Multipurpose Irrigation and Power Project-IC	1997-2004	Region 3	Nueva Ecija	1,641	33,359	35,000
6	Balog-Balog Multipurpose Project	1999-2006	Region 3	Tarlac	0	24,849	24,849
7	Bago RIS Rehabilitation & Improvement Project	2000-2005	Region 6	Negros Occidental	0	2,500	2,500
8	Bohol Irrigation Project II	2000-2005	Region 7	Bohol	0	4,550	4,550
9	Basey Irrigation Project	1996-2004	Region 8	Western Samar	0	3,000	3,000
10	Irrigation Systems Improvement Project (ISIP) II	1997-2002	Region 8	Leyte	0	809	809
11	Bubunawan Irrigation Project	1996-2003	Region 10	Bukidnon	0	2,000	2,000
12	Rural Development Pilot Project for Muslim Mindanao	2000-2002	Region 12	Lanao del Sur	0	2,800	2,800
13	Malitubog-Maridagao Irrigation Project I	1989-2002	Region 12	North Cotabato	632	10,208	10,840
14	Kabulnan Irrigation & Area Development Project	1992-2000	Region 12	Maguindanao	4,636	6,394	11,030
15	Lower Agusan Development Project - IC	1996-2002	Region 13	Agusan del Norte	0	7,082	7,082
16	Southern Philippines Irrigation Sector Project (SPISP)	2000-2006	Southern Philippines	Southern Philippines	0	15,500	15,500
17	Water Resources Development Project (WRDP)	1997-2002	Nationwide	Nationwide	139	6,857	6,996
	Total				**8,124**	**162,036**	**170,160**

Source: CORPLAN, NIA (As of February 2001)

National Irrigation Projects (NIPs) (Proposed NIPs to be implemented up to 2004)

No.	Name of Projects	Schedule	Region	Province	Total Target Area (ha)
1	Rizal (Aliog) Irrigation Project	2002-2003	CAR	Kalinga	1,500
2	Tineg River Irrigation Project	2004-2005	CAR	Abra	3,200
3	Infanta Impounding Irrigation Project	2003-2004	Region 1	Pangasinan	560
4	Ilocos Norte Irrigation Project Phase II (Palsiguan)	2001-2010	Region 1	Ilocos Norte	12,400
5	Banaoang Irrigation Project	2002-2004	Region 1	Ilocos Sur	6,000
6	Tumauini Reservoir Project	2003-2008	Region 2	Cagayan / Isabela	2,385
7	North Lawis Irrigation Project	2000-2003	Region 3	Zambales	1,270
8	Mapanuepe Lake Irrigation Project	2003-2004	Region 3	Zambales	1,900
9	Quipot Irrigation Project Phase I and II	2000-2005	Region 4	Quezon	3,410
10	Bicol River Basin Flood Control & Irrigation Development Project-IC	2004-2010	Region 5	Camarines Norte	6,100
11	Help for Catubig Agricultural Advancement Project Stage I	2001-2006	Region 8	Northern Samar	4,550
12	Marabong-Upper Daguitan Irrigation Project	2004-2005	Region 8	Northern Leyte	2,400
13	Titay Valley Irrigation Project	2003-2006	Region 9	Zamboanga del Norte & Sur	3,800
14	Sibuguey RIS Extension Project	2003-2005	Region 9	Zamboanga del Sur	3,000
15	Kadingilan Irrigation Project	2002-2005	Region 10	Bukidnon	6,000
16	Muleta Reservoir Irrigation Project	2002-2007	Region 10	Bukidnon	2,400
17	Talakag Irrigation Project	2003-2004	Region 10	Bukidnon	2,800
18	Balingasag Irrigation Project	2003-2005	Region 10	Misamis Oriental	2,000
19	Saug Reservoir Project	2002-2007	Region 11	Davao del Norte	5,000
20	Talayan River Irrigation System Rehabilitation Project	2002	Region 12	Maguindanao	388
21	Alip River Irrigation System Rehabilitation Project	2002	Region 12	Maguindanao	300
22	Pagalungan River Irrigation System Rehabilitation Project	2003-2005	Region 12	Maguindanao	380
23	Malitubog-Libungan Transbasin Irrigation Project	2002-2008	Region 12	Maguindanao / North Cotabato	5,000
24	Adgaoan-Umayan Irrigation Project	2003-2008	Region 13	Agusan del Sur	16,000
25	Grain Sector Development Program - IC	2001-2005	Nationwide	Nationwide	908
	Total				**93,651**

Source: CORPLAN, NIA (As of February 2001)

Table II.3 Major Items of Irrigation Inventory

No.	Item	Unit	NIS	NIP		CIS
				On-going	Proposed	
1.	Name of Responsible Office	-	O	O	O	O
2.	Location					
	a. Region	-	O	O	O	O
	b. Province	-	O	O	O	O
	c. Municipality	-	O	O	O	O
	d. Latitude & Longitude (at Intake Site)					
	N. Latitude	-	O	O	O	O
	E. Longitude	-	O	O	O	O
	e. Distance from NIA's Regional Irrigation Office (at Intake Site)	km	O	O	O	O
	f. Distance from NIA's Provincial Irrigation Office (at Intake Site)	km	-	-	-	O
3.	Source of Water Supply	-	O	O	O	O
4.	Approved Water Right	m^3/sec	O	O	O	O
5.	Catchment Area at Intake Site	km^2	O	O	O	O
6.	Project History					
	a. Year of Feasibility Study Completed	-	O	O	O	O
	b. Year of Detailed Design Completed	-	O	O	O	O
	c. Year of Construction Started	-	O	O	-	O
	d. Year of Construction Completed	-	O	-	-	O
	e. Year of Operation Started	-	O	-	-	O
	f. Year of Rehabilitation Works (Latest)	-	O	-	-	O
7.	Total Construction Cost (Original)	Pesos	O	-	-	O
8.	Total Construction Cost (Estimate)	Pesos	-	O	O	-
9.	Irrigation Service Area (ISA) (Actual)	ha	O	-	-	O
10.	Irrigation Service Area (ISA) (Designed Irrigable Area)	ha	-	O	O	-
11.	Irrigated Area					
	a. Irrigated Area in the Wet Season	ha	O	-	-	O
	b. Irrigated Area in the Dry Season	ha	O	-	-	O
12.	Benefited Area					
	a. Benefited Area in the Wet Season	ha	O	-	-	-
	b. Benefited Area in the Dry Season	ha	O	-	-	-
13.	Number of Irrigation Divisions	nos.	O	-	-	O
14.	Type of Intake Facilities	-	O	O	O	O
15.	Designed Intake Discharge	m^3/sec	O	O	O	O
16.	Length of Main Canal					
	a. Lined Canal	km	O	O	O	O
	b. Unlined Canal	km	O	O	O	O
	c. Total	km	O	O	O	O
17.	Length of Laterals					
	a. Lined Canal	km	O	O	O	O
	b. Unlined Canal	km	O	O	O	O
	c. Total	km	O	O	O	O
18.	Number of Irrigation Canal Structures	nos.	O	O	O	O
19.	Length of Service Roads	km	O	O	O	O
20.	Length of Access Roads	km	O	O	O	O
21.	Drainage Density (Total Length of Drains / ISA)	km/ha	O	O	O	O
22.	Farm Ditch Density (Total Length of Farm Ditches / ISA)	km/ha	O	O	O	O
23.	Average Annual Rainfall	mm	O	O	O	O
24.	Accomplishment (Progress) of Project Implementation					
	a. Financial Accomplishment (Progress)	%	-	O	-	-
	b. Physical Accomplishment (Progress)	%	-	O	-	-
25.	Average Crop Yield (Rice)					
	a. Average Crop Yield (Rice) in the Wet Season	t/ha	O	-	-	O
	b. Average Crop Yield (Rice) in the Dry Season	t/ha	O	-	-	O
26.	Cropping Intensity	%	O	-	-	O
27.	ISF Collection Efficiency	%	O	-	-	-
28.	Viability Index (Income-Expense Ratio)	-	O	-	-	-
29.	Numbers of Farmers (households) in the Irrigation Service Area	nos.	O	-	-	O
30.	Land Holding Distribution of Farmers (households)					
	a. 2 ha & Below	nos.	O	-	-	O
	b. 2 - 5 ha	nos.	O	-	-	O
	c. More than 5 ha	nos.	O	-	-	O
31.	Average Farm Size of Farmers	ha/household	O	-	-	O
32.	Date Turned over to IA	-	-	-	-	O
33.	Amortization Status (IA Loan)					
	a. Total Loan Amount	Pesos	-	-	-	O
	b. Cumulative Collected Amount	Pesos	-	-	-	O
34.	Operation Status (Operational / Non operational)	-	-	-	-	O

Note: O: Particular to be mentioned.
Source: JICA Study Team

FIGURES

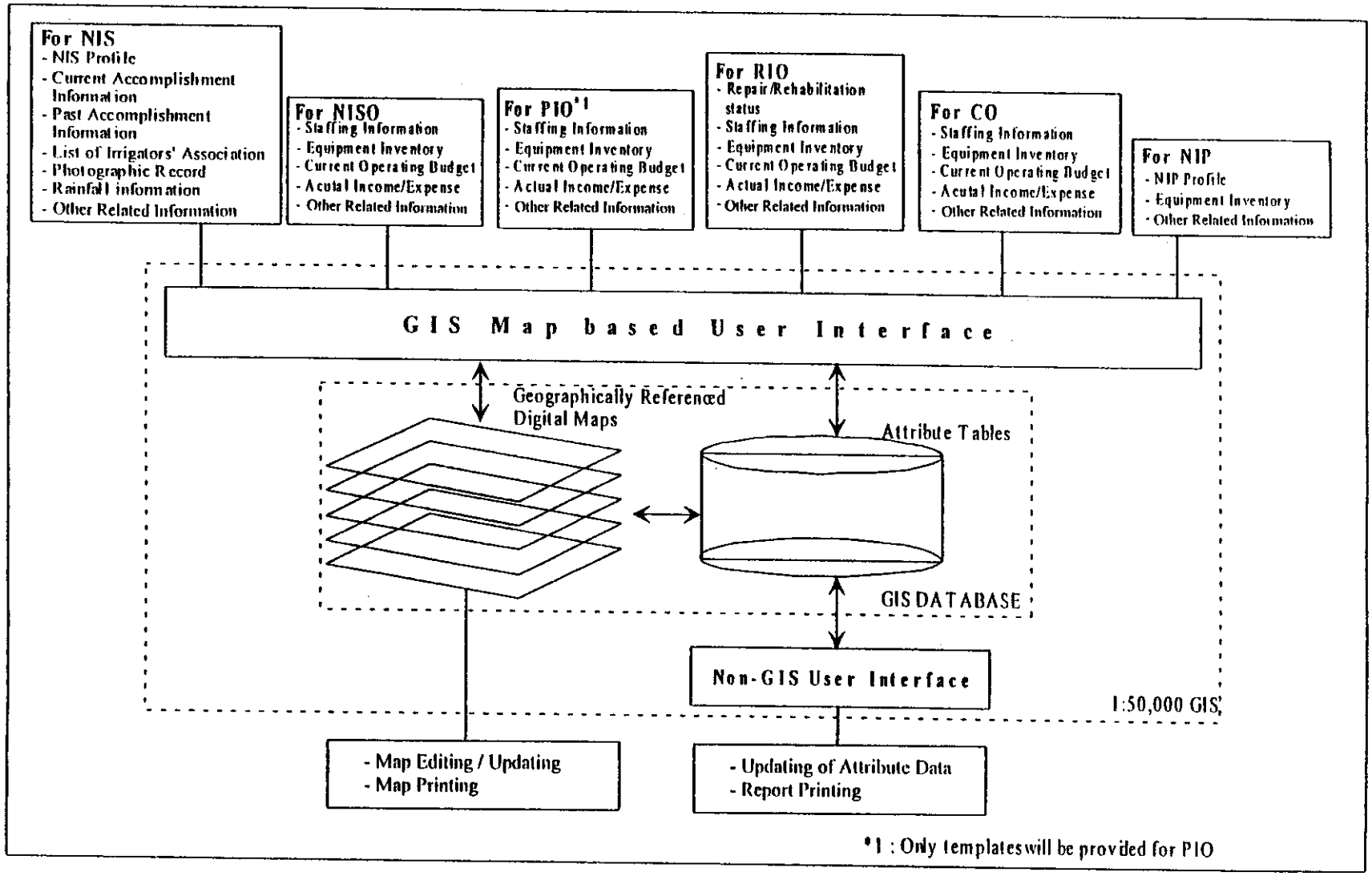


Figure II.1 Schematic Diagram of 1:50,000 GIS Database

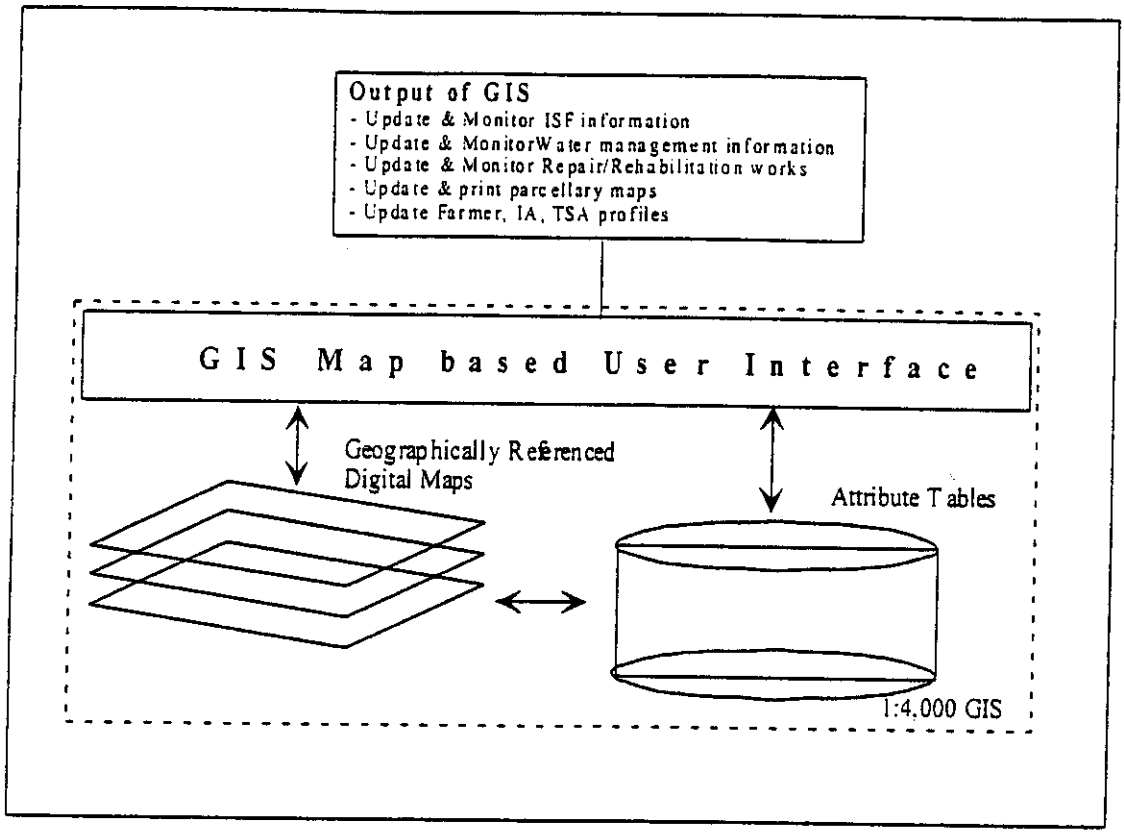


Figure II.2 Schematic Diagram of 1:4,000 GIS Database

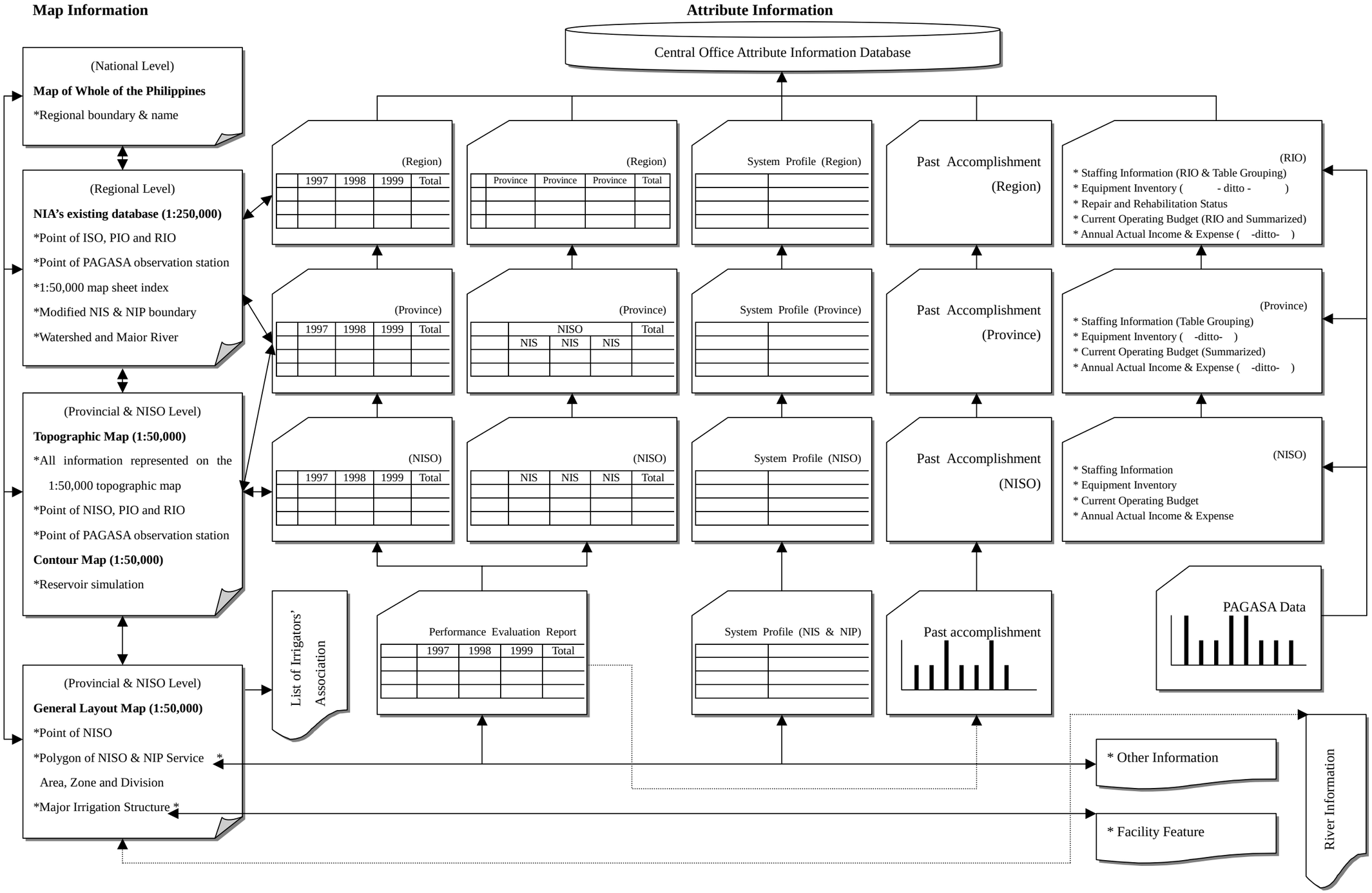


Figure II.3 Type of Output and Schematic Flowchart of User Interface (1:50,000 GIS Database)

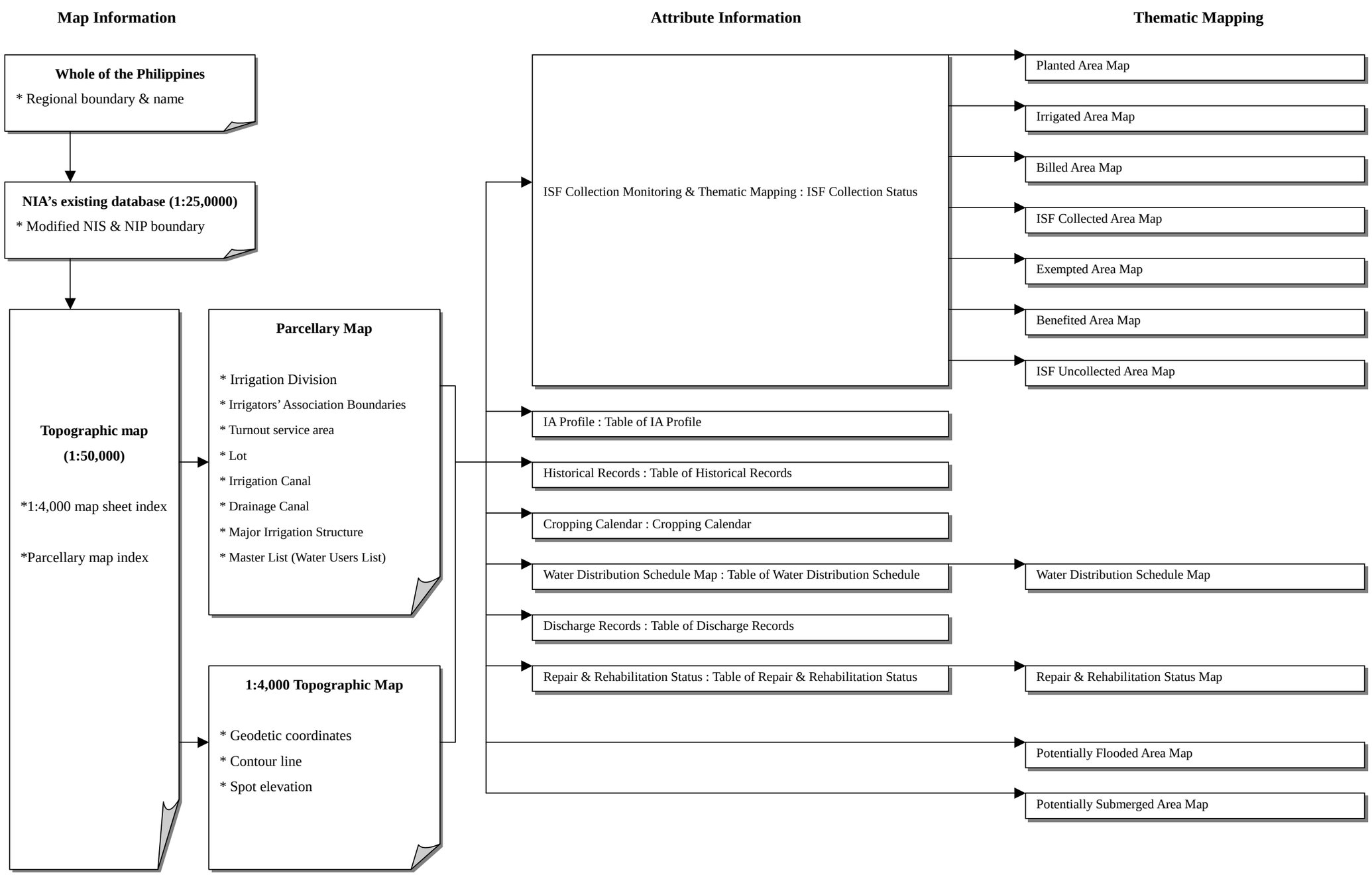


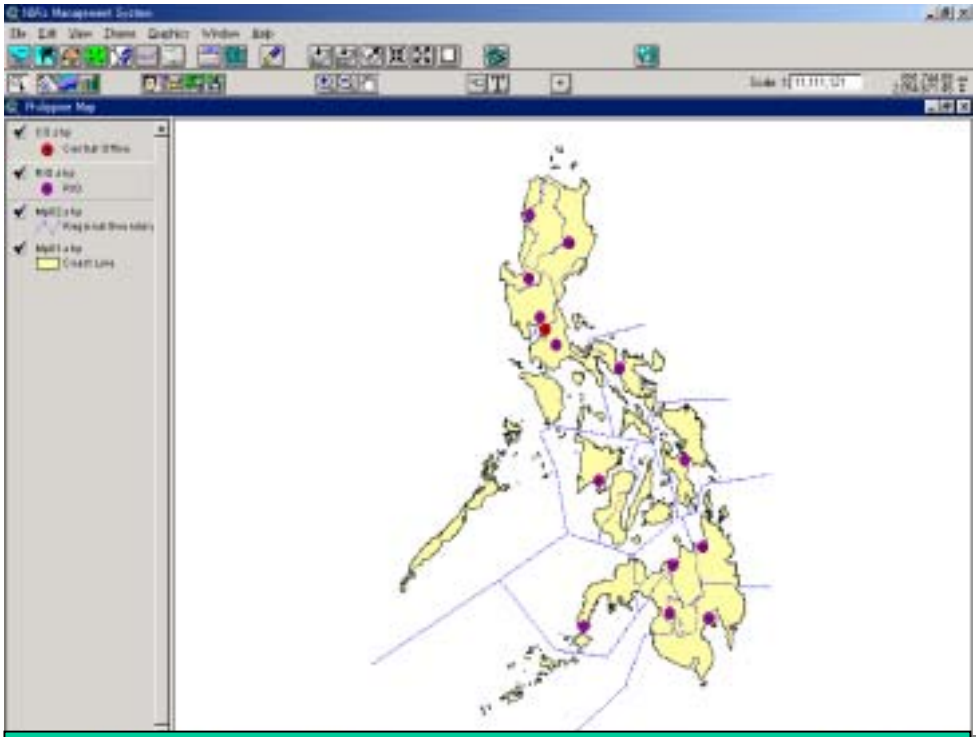
Figure II.4 Type of Output and Schematic Flowchart of User Interface (1:4,000 GIS Database)

ATTACHMENT

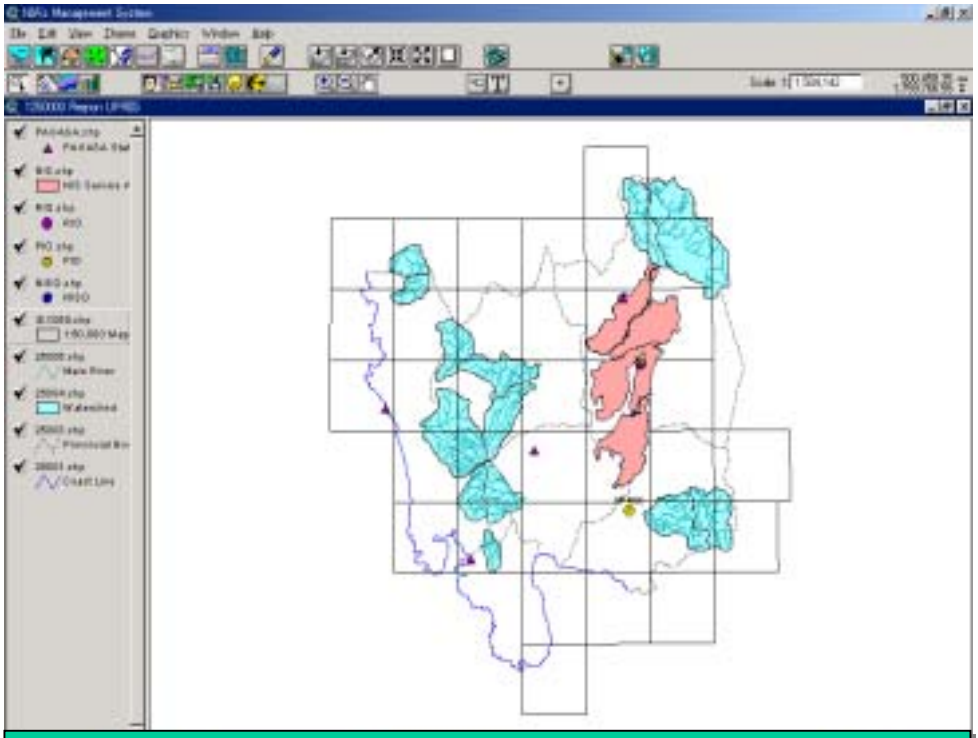
ATTACHMENT II.1

1:50,000 GIS Database (System-A)
Sample Templates of Output and Sample Maps

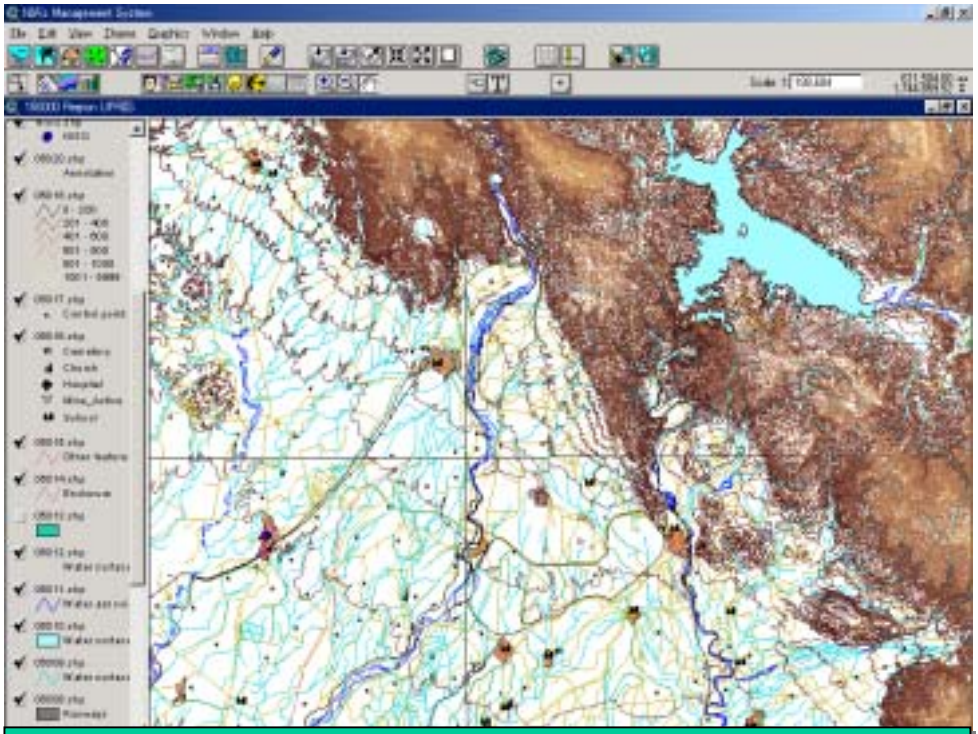
1-1 Map of Whole of the Philippines
1:250,000 Region Map
1-2 1:50,000 Topographic Map
General Layout Map
1-3 Rainfall Information
River Information
1-4 Facility Feature
Past Accomplishment
1-5 Calculation of Reservoir Volume & Water Surface Area of Proposed Reservoir



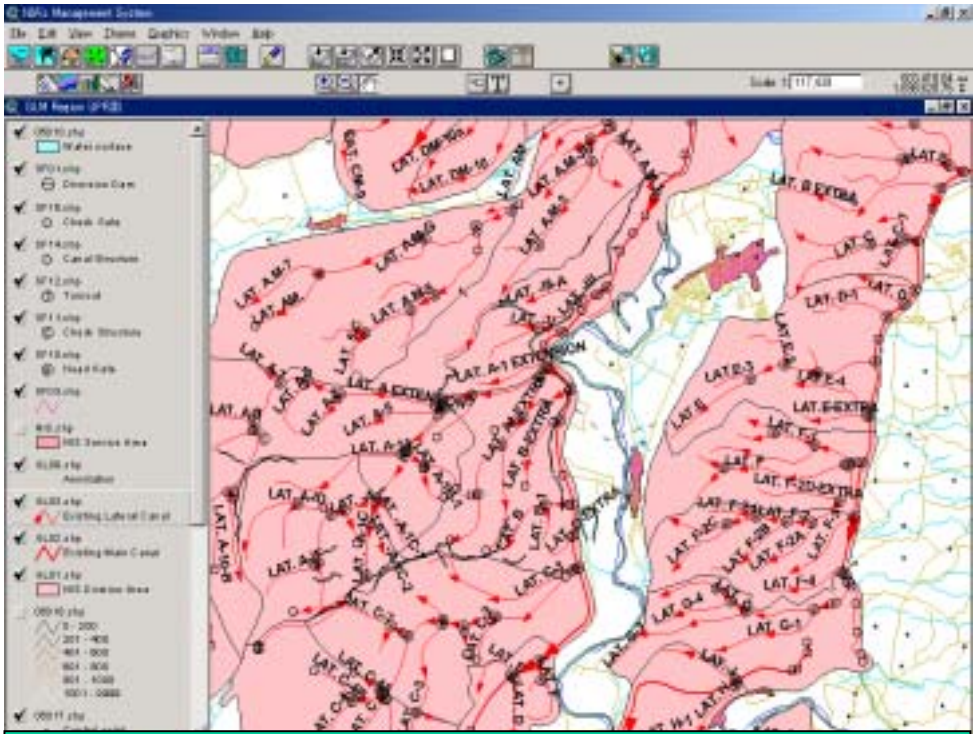
Map of Whole of the Philippines



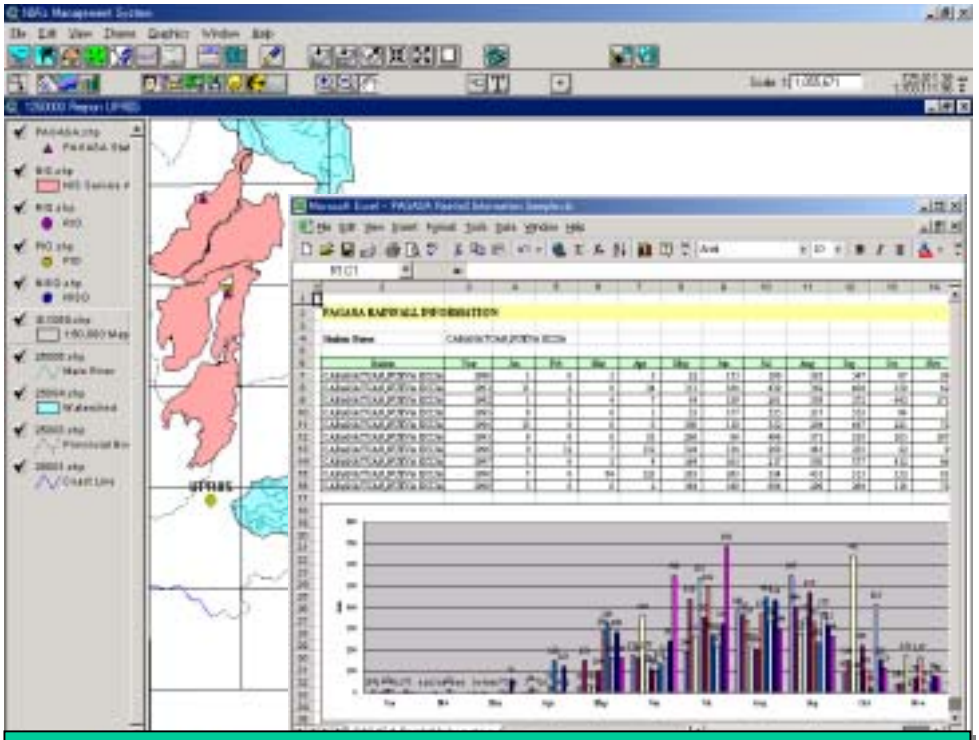
1: 250,000 Region Map



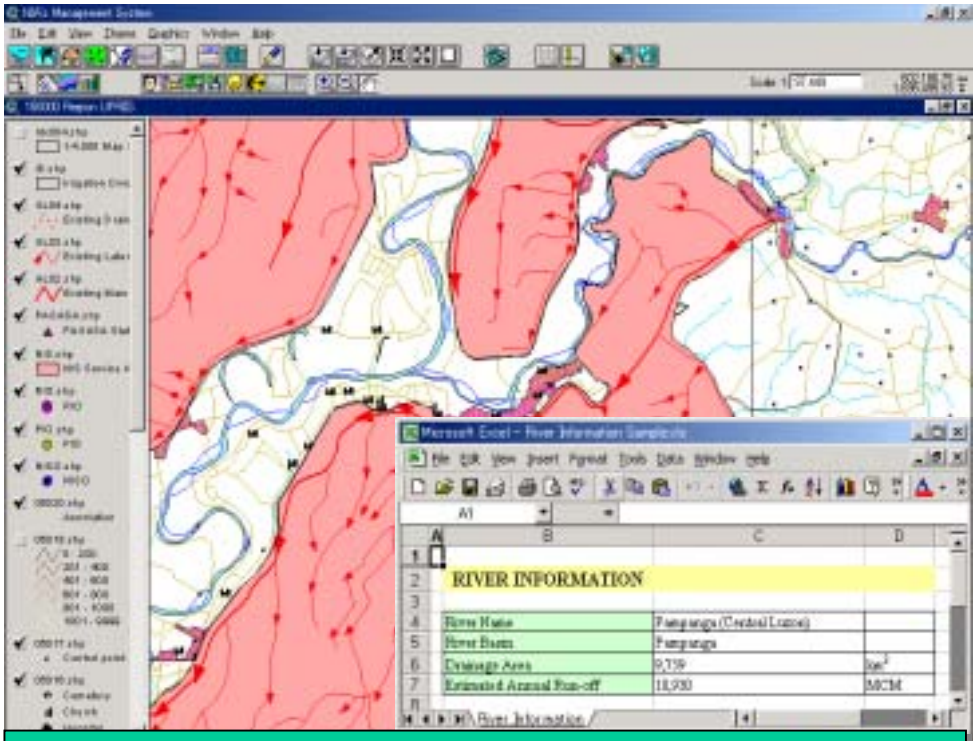
1:50,000 Topographic Map



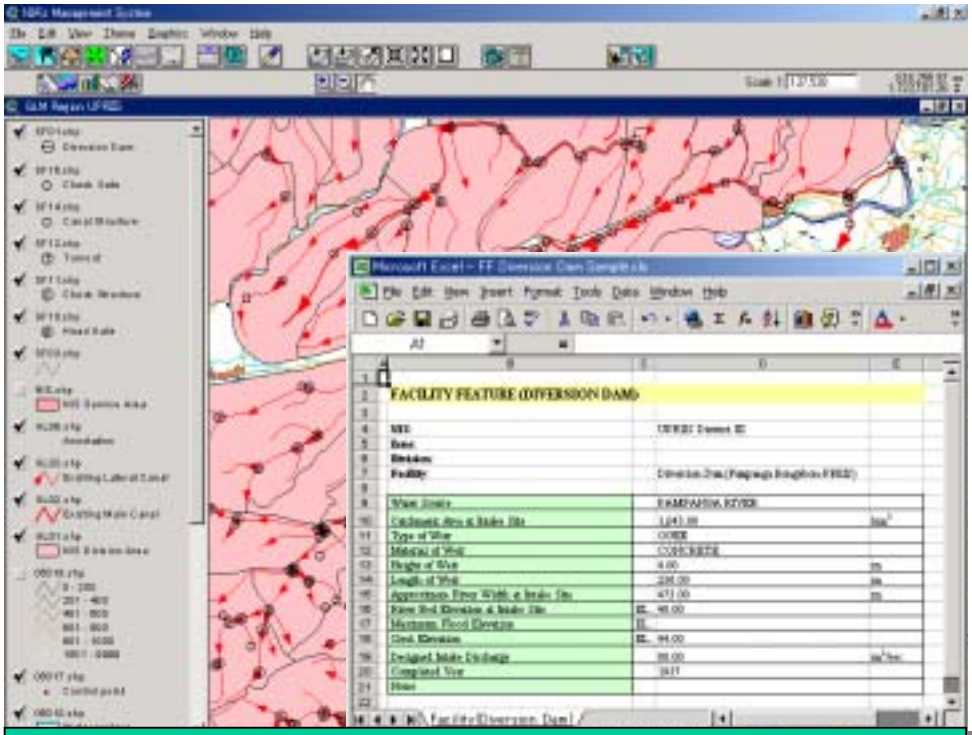
General Layout Map



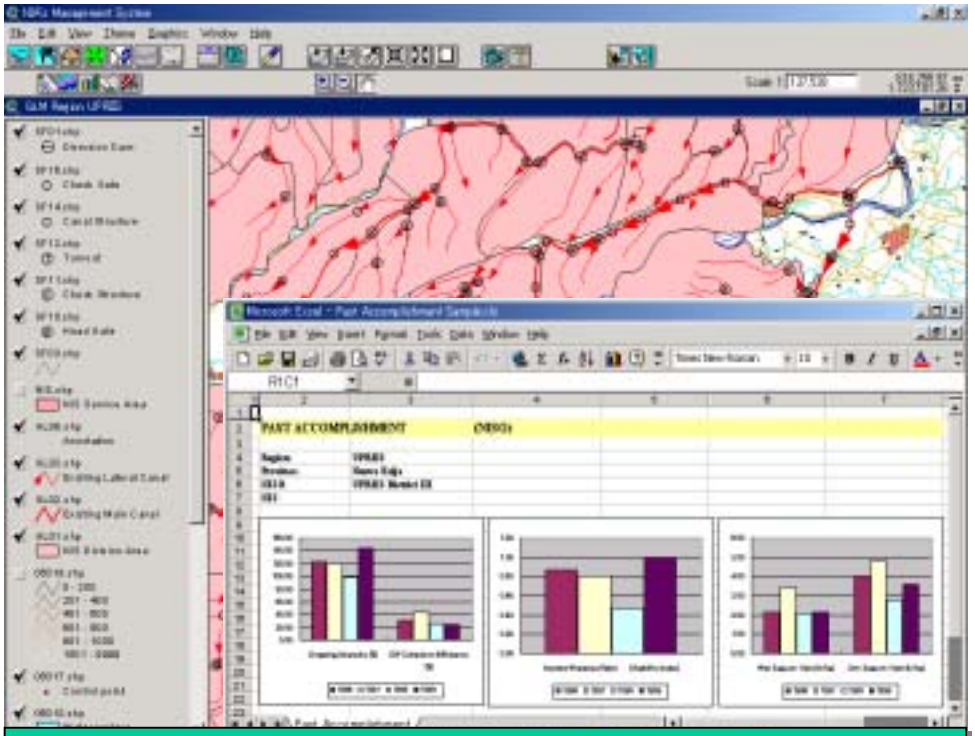
Rainfall Information



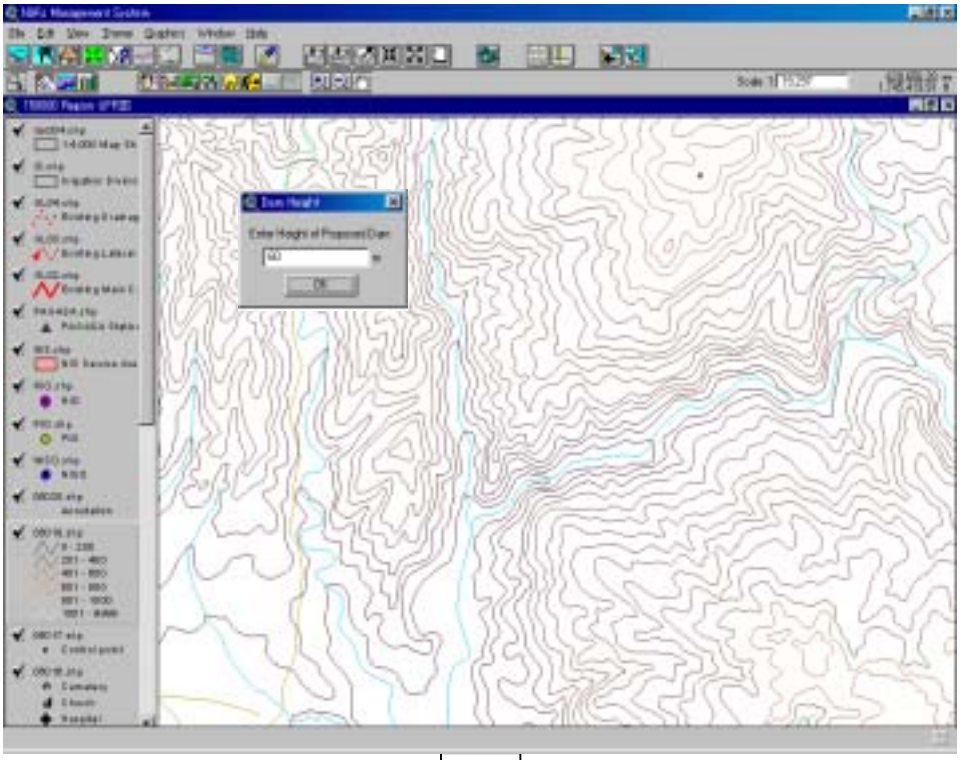
River Information

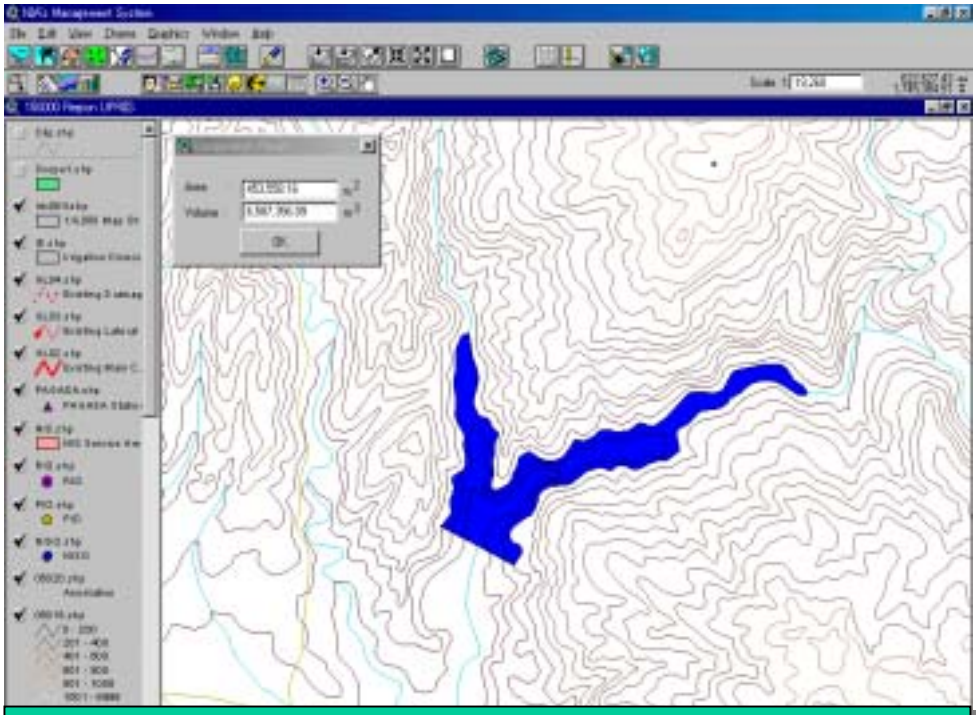


Facility Feature



Past Accomplishment



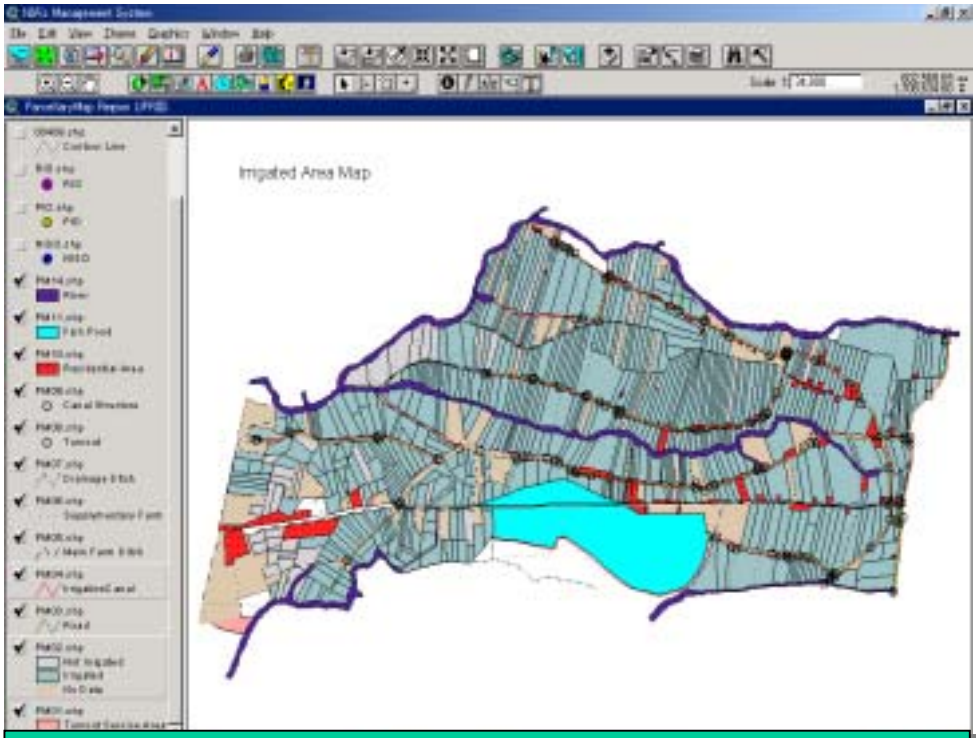


Calculation of Reservoir Volume &Water Surface Area of Proposed Reservoir

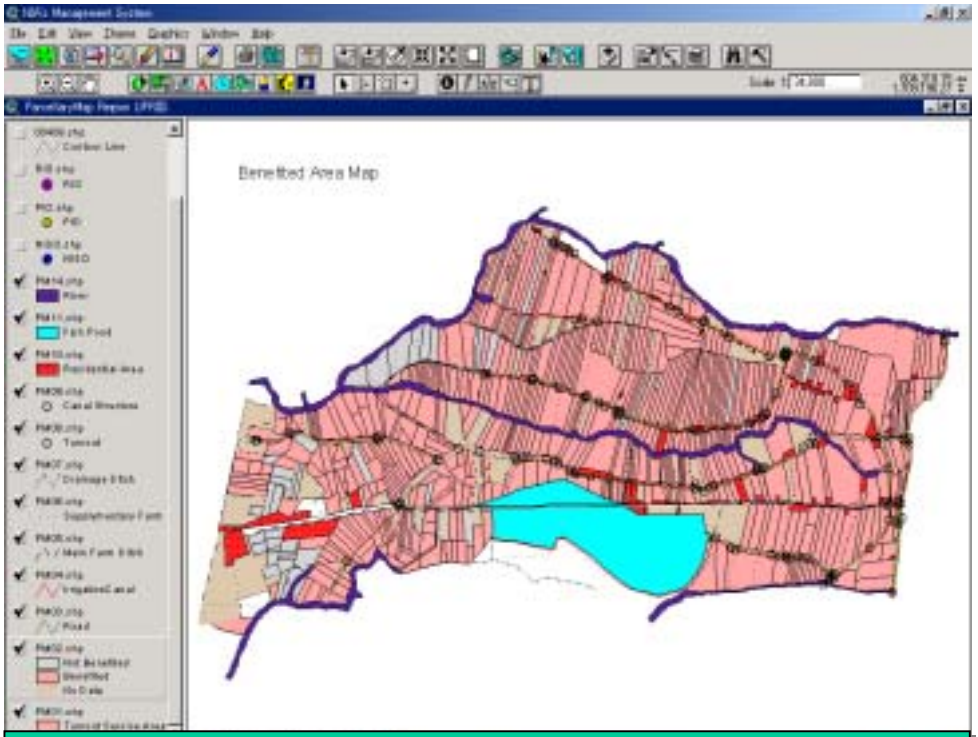
ATTACHMENT II.2

1:4,000 GIS Database (System-B)
Sample Templates of Output and Sample Maps

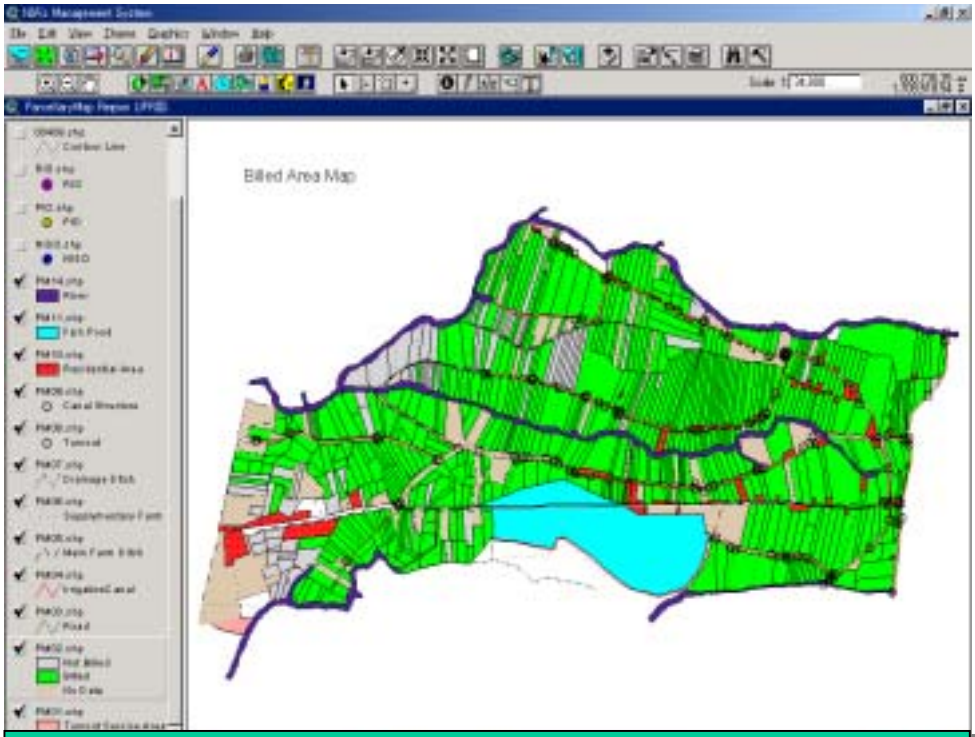
2-1 Irrigated Area Map
Benefited Area Map
2-2 Billed Area Map
ISF Uncollected Area Map



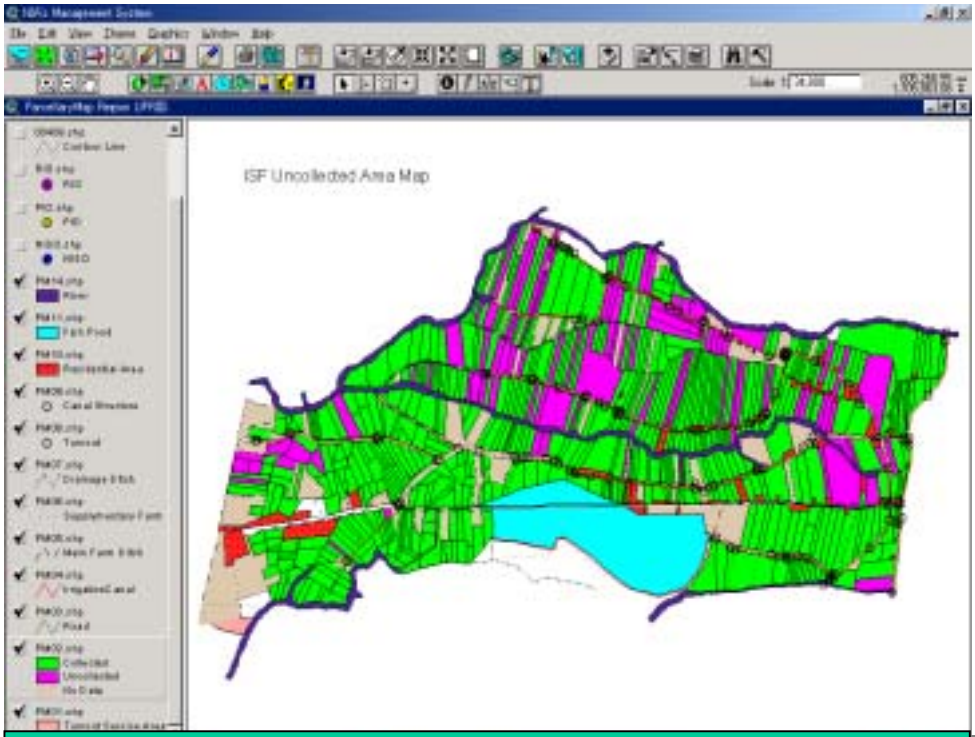
Irrigated Area Map



Benefited Area Map



Billed Area Map



ISF Uncollected Area Map

APPENDIX III

FARMERS' INTENTION SURVEY

APPENDIX – CHAPTER III

FARMERS' INTENTION SURVEY

TABLE OF CONTENTS

LIST OF ATTACHMENTS

CHAPTER III FARMERS' INTENTION SURVEY

1. Objective of the Survey

The Farmers' Intention Survey aims to: (a) grasp the present economic situations of the beneficiary farm households in the designated National Irrigation Systems (NIS) and Communal Irrigation Systems (CIS), and (b) identify their views and opinions on particular issues related to the water management, maintenance and operation of the irrigation facilities and the irrigation service fees.

2. Areas for Survey

The areas for the Survey were basically chosen from the sites of the selected model/ replication NISOs and the adjacent CISs in Luzon and Visayas. In addition, one NIS and CIS in Mindanao were selected to represent each of the three major islands of the country as indicated below:

1) Nayom Bayto NIS and Malimanga CIS in Zambales,
2) UPRIIS District III – Zone 1 and Palayan CIS in Nueva Ecija,
3) Aganan NIS and Alapasco CIS in Iloilo, and
4) Lasang NIS and Upper Taganay CIS in Davao del Norte.

The Survey started on 19 October 2000 and completed in mid-December 2000.

3. Methodology

This Survey was carried out by the methods of the Rapid Rural Appraisal (RRA) using questionnaire. The questionnaire format for this Survey is given in Table III.1.

The respondents were selected through random sampling. A total of 1,085 farming households was randomly selected and interviewed from four (4) NIA irrigation systems representing the three major islands of the Philippines. The total respondents of the Survey (1,085) were distributed as follows:

Site	No. of Respondents		Total
	NIS	CIS	
1. Zambales	200	45	245
2. Nueva Ecija	302	45	347
3. Iloilo	200	45	245
4. Davao	203	45	248
Total	905	180	1,085

Respondents were selected from the farmer-members of the different Irrigators' Associations (IAs) from the upstream, midstream and downstream locations of the irrigation systems. In cases where there are non-member of IA who benefited from the irrigation facilities, 10% of the total number of beneficiaries per area (at maximum), were selected from non-member. Selection of respondents should be in coordination and consultation with the NIA personnel.

4. Highlights of the Survey

The highlights of the survey are as follows:

(1) General Information

The average farming household size is six (6). Around 82% of the respondents (757) are male and most of them (65%) of the respondents are in the 40 to 64 years age bracket.

(2) Living Environment and Living Condition

About 61% (552 respondents) of the NIS households have annual incomes falling within the PHP10,000 to PHP60,000 bracket. It will be noted that a sizeable number across all areas have an annual income of more than PHP100,000 (117 or 12.9%). More than one fourth or 27.7% (141) of the respondents own irrigated farms from 0.6 to 1 hectare while others are distributed in the different bracket. When asked of their perception as to their social status, 582 respondents or 56.6% answered that they are fairly poor.

Total Annual Income

Annual Income (PHP)	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. 0-10,000	11	3.6	18	9.0	7	3.5	3	1.5	39	4.3
2. 10,001-20,000	29	9.6	39	19.5	24	12.0	19	9.4	111	12.3
3. 20,001-30,000	35	11.6	33	16.5	26	13.0	16	7.9	110	12.2
4. 30,001-40,000	42	13.9	23	11.5	23	11.5	45	22.2	133	14.7
5. 40,001-50,000	35	11.6	14	7.0	23	11.5	42	20.7	114	12.6
6. 50,001-60,000	26	8.6	15	7.5	23	11.5	20	9.9	84	9.3
7. 60,001-70,000	16	5.3	15	7.5	10	5.0	11	5.4	52	5.7
8. 70,001-80,000	20	6.6	10	5.0	14	7.0	12	5.9	56	6.2
9. 80,001-90,000	24	7.9	8	4.0	12	6.0	8	3.9	52	5.7
10. 90,001-100,000	19	6.3	7	3.5	5	2.5	6	3.0	37	4.1
11. 100,000 and above	45	14.9	18	9.0	33	16.5	21	10.3	117	12.9
12. No answer	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

Note: Freq. = Frequency (no. of respondents)

Size of Owned Irrigated Land in ha

Area (ha)	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. 0.1-0.5	16	8.6	39	37.1	19	17.0	26	24.8	100	19.6
2. 0.6-1.0	36	19.3	36	34.3	43	38.4	26	24.8	141	27.7
3. 1.1-1.5	34	18.2	16	15.2	13	11.6	17	16.2	80	15.7
4. 1.6-2.0	42	22.5	8	7.6	24	21.4	16	15.2	90	17.7
5. 2.1-2.5	12	6.4	1	1.0	4	3.6	9	8.6	26	5.1
6. 2.6-3.0	25	13.4	1	1.0	4	3.6	3	2.9	33	6.5
7. 3.1-3.5	7	3.7	2	1.9	2	1.8	2	1.9	13	2.6
8. 3.6-4.0	4	2.1	1	1.0	0	0.0	3	2.9	8	1.6
9. more than 4.0	11	5.9	1	1.0	3	2.7	3	2.9	18	3.5
Total Samples	187	100.0	105	100.0	112	100.0	105	100.0	509	100.0

(3) Water Management

1) Level of Satisfaction of the Beneficiary Farmers

About 450 respondents (49.8%) or nearly one half of the farming households signified satisfaction with the management of NIA. To the contrary, it should be noted that 34.0% of the respondents answered “slightly satisfied” followed by 16.2% of “not satisfied”. Those who are “slightly satisfied” and “not satisfied” with NIA management have indicated the following two main reasons: (a) poorly maintained irrigation facilities and (b) inadequate supply of irrigation water (detailed distribution of the respondents is shown in the table below). Dissatisfaction in the water management is registered to be comparatively higher (152 respondents) in Davao.

Level of Satisfaction from Water Management of the NIA-Irrigation System Office

Level of Satisfaction	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Very much satisfied	55	18.2	20	10.0	22	11.0	5	2.5	102	11.3
2. Satisfied	129	42.7	96	48.0	77	38.5	46	22.7	348	38.5
3. Slightly satisfied	86	28.5	70	35.0	87	43.5	65	32.0	308	34.0
4. Not satisfied	32	10.6	14	7.0	14	7.0	87	42.9	147	16.2
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

Reason for Dissatisfaction

Reasons	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Inadequate supply of irrigation water	126	40.8	62	40.8	98	40.8	118	26.2	404	35.1
2. Poorly maintained irrigation facilities	68	22.0	44	28.9	75	31.3	142	31.5	329	28.6
3. Lack of information dissemination	28	9.1	4	2.6	13	5.4	32	7.1	77	6.7
4. Lack of responsibility and duties of ISO	26	8.4	10	6.6	12	5.0	31	6.9	79	6.9
5. Complicated procedure	19	6.1	9	5.9	10	4.2	50	11.1	88	7.6
6. Weak organization of the ISO	4	1.3	3	2.0	10	4.2	12	2.7	29	2.5
7. High irrigation service fee	21	6.8	3	2.0	5	2.1	12	2.7	41	3.6
8. Unjust policy in granting exemption	8	2.6	0	0.0	5	2.1	12	2.7	25	2.2
9. Others	9	2.9	17	11.2	12	5.0	42	9.3	80	6.9
Total Samples	309	100.0	152	100.0	240	100.0	451	100.0	1,152	100.0

2) Conditions of the Irrigation Facilities

Majority of the farmers (618 or 68.3%) said that the irrigation facilities are adequately and fairly maintained. For those who answered that they have experienced problems regarding irrigation, they have identified the following, among others: silted canal bottom, canal erosion, check gate problems and low embankments. Only about 2/5 of them said that the flow of the water in the terminal canal is adequate during the dry season.

Physical Condition of Irrigation Facilities

Conditions	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Adequately maintained	65	21.5	63	31.5	23	11.5	13	6.4	164	18.1
2. Fairly maintained	198	65.6	72	36.0	122	61.0	62	30.5	454	50.2
3. Poorly maintained	37	12.3	25	12.5	45	22.5	123	60.6	230	25.4
4. Not maintained	2	0.7	34	17.0	4	2.0	5	2.5	45	5.0
5. Not applicable	0	0.0	6	3.0	6	3.0	0	0.0	12	1.3
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

It will be noted that Davao area respondents (123 or 25.4%) have the highest incidence of respondents who said that irrigation facilities are poorly maintained as compared to other areas.

Problems regarding Irrigation System

Problems	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Low embankment	98	14.6	58	22.5	83	17.3	70	11.4	309	15.3
2. Silted canal bottom	118	17.6	35	13.6	85	17.7	161	26.1	399	19.7
3. Erosion in canal	130	19.4	41	15.9	119	24.8	136	22.1	426	21.1
4. Problems in turn-outs	120	17.9	30	11.6	31	6.5	124	20.1	305	15.1
5. Problems in check gate	105	15.7	31	12.0	58	12.1	72	11.7	266	13.1
6. No measuring device	32	4.8	2	0.8	3	0.6	13	2.1	50	2.5
7. Lack of terminal facilities	38	5.7	28	10.9	35	7.3	15	2.4	116	5.7
8. Others	28	4.2	33	12.8	66	13.8	25	4.1	152	7.5
Total Samples	669	100.0	258	100.0	480	100.0	616	100.0	2023	100.0

3) Conflicts over the Use of Irrigation Water

Majority (485 or 53.6%) of the farmers said that they have never been involved in conflict over the use of water. For those few who have been involved in conflict, cited reasons for conflict are: priority in the use of water, schedule of water delivery, drainage problem, lack of water, problem on physical facilities, and inadequate information regarding water delivery schedule.

If Involved in Conflict, Kind of Conflict Involved in

Kinds of Conflicts	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Priority in the case of water	69	16.5	26	25.0	76	23.8	91	23.5	262	21.3
2. Schedule of water delivery	82	19.6	44	42.3	39	12.2	63	16.3	228	18.6
3. Lack of communication during the time of water distribution	63	15.0	18	17.3	42	13.2	34	8.8	157	12.8
4. Problem on physical facilities	59	14.1	11	10.6	23	7.2	54	14.0	147	12.0
5. Lack of water	71	16.9	0	0.0	71	22.3	65	16.8	207	16.8
6. Drainage problem	43	10.3	3	2.9	30	9.4	46	11.9	122	9.9
7. Destruction of irrigation facilities	21	5.0	2	1.9	27	8.5	31	8.0	81	6.6
8. Others	11	2.6	0	0.0	11	3.4	3	0.8	25	2.0
Total Samples	419	100.0	104	100.0	319	100.0	387	100.0	1,229	100.0

4) Contract Type between NIA and IA

About (458 or 50.6%) of the NIS farmer-respondents mentioned that the type of contract of IA with NIA-ISO is combination of Type I and Type II contracts. Others mentioned to

have their contracts as Type I (16.5% or 149 respondents). It should be noted however that a big percentage (21.7% or 196 respondents) responded that they don't know or have no idea about the kind of contract their IA have with the NIA.

Type of Contract of IA with NIA ISO

Types of Contract	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Type I	27	8.9	122	61.0	0	0.0	0	0.0	149	16.5
2. Type II	44	14.6	15	7.5	0	0.0	0	0.0	59	6.5
3. Type III	0	0.0	3	1.5	0	0.0	0	0.0	3	0.3
4. Others	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5. Combination of Type I and Type II	103	34.1	31	15.5	121	60.5	203	100.0	458	50.6
6. Don't know/No idea	128	42.4	9	4.5	59	29.5	0	0.0	196	21.7
7. Not applicable	0	0.0	20	10.0	20	10.0	0	0.0	40	4.4
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

5) Reasons for IA's Inactivity

Majority (537 or 59.3%) of the respondent-farmers think that their respective IAs perform an active role in actual water management. For those who think that the IA is inactive, among the reasons cited are: poor attendance during meetings, lack of funds to operate and maintain the facilities, incompetence of IA officers and schedule of water distribution not followed. Table below shows the distribution of the reasons given:

Reasons for being Inactive of the IA

Reasons	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. No proper care and maintenance of the system	4	7.7	5	11.9	6	8.2	17	13.7	32	11.0
2. Majority of members don't attend meetings	10	19.2	1	2.4	2	2.7	2	1.6	15	5.2
3. Lack of responsibility of IA Officials to perform duties	10	19.2	3	7.1	13	17.8	0	0.0	26	8.9
4. Unequal distribution of water	9	17.3	2	4.8	11	15.1	0	0.0	22	7.6
5. Lack of implementation of policy on water management	0	0.0	14	33.3	0	0.0	7	5.6	21	7.2
6. Lack of basic management skills	0	0.0	0	0.0	0	0.0	35	28.2	35	12.0
7. No IA leaders	0	0.0	0	0.0	17	23.3	0	0.0	17	5.8
8. No unity among members	0	0.0	4	9.5	0	0.0	11	8.9	15	5.2
9. Others	19	36.5	13	31.0	24	32.9	52	41.9	108	37.1
Total Samples	52	100.0	42	100.0	73	100.0	124	100.0	291	100.0

6) Suggestions to Strengthen Water Management

Respondents proposed the following measures to improve water management: re-organization of IA/ change of leadership, observance of water distribution schedule, strengthening of IA, NIA fund allocation for repair and maintenance and provision of training on water management.

Proposals to Improve the Situation of Water Management

Proposed Improvement	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Intensify strengthening of IA and reactivate membership	11	24.4	6	14.6	13	30.2	14	10.7	44	16.9
2. Conduct of seminars/trainings for IA Officers	0	0.0	7	17.1	0	0.0	28	21.4	35	13.5
3.NIA should allocate fund for repair and maintenance of irrigation facilities	0	0.0	1	2.4	0	0.0	27	20.6	28	10.8
4. Strict implementation of policies on water management	10	22.2	1	2.4	0	0.0	11	8.4	22	8.5
5. Follow schedule of water distribution/ improve water distribution	2	4.4	0	0.0	12	27.9	4	3.1	18	6.9
6. Reorganized IA	0	0.0	15	36.6	7	16.3	0	0.0	22	8.5
7. Others	22	48.9	11	26.8	11	25.6	47	35.9	91	35.0
Total Samples	45	100.0	41	100.0	43	100.0	131	100.0	260	100.0

Of the suggestions given by the respondents across all areas, they think, that intensification of the strengthening of IA and reactivation of the membership would play an important role to an improved water management, In Davao, they think that there should also be the conduct of seminars and trainings on water management; and the allocation of fund for maintenance of the system.

8) Key Factors for Successful Water Management

When asked about the most important factor in the implementation of better water management, farmer-respondents said that good irrigation facilities, sufficient water supply and strengthening of irrigators' association are of prime importance.

Most Important Factor in the Implementation of Better Water Management

Factors	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Good irrigation facilities	144	47.7	133	66.5	67	33.5	92	45.3	436	48.2
2. Sufficient water supply	100	33.1	32	16.0	95	47.5	49	24.1	276	30.5
3. Delegation of responsibility to farmers' organization	33	10.9	3	1.5	4	2.0	9	4.4	49	5.4
4. Strengthening of irrigators association	23	7.6	8	4.0	13	6.5	51	25.1	95	10.5
5. Others	0	0.0	3	1.5	1	0.5	2	1.0	6	0.7
6. No answer	2	0.7	1	0.5	0	0.0	0	0.0	3	0.3
7. Not applicable	0	0.0	20	10.0	20	10.0	0	0.0	40	4.4
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

(4) ISF Payments

1) Modes of ISF Payment

Almost half (422 or 48.8%) of the NIS farmers pay the ISF in cash while majority of the CIS farmers pay in palay. NIS farmers answered that it is for reason of convenience they pay in cash. Also, the collectors prefer to accept payment in cash. A big (189 or 20%) percentage, however, their payment is also partly determined by the prevailing price of palay in the market. If the price of palay is high, they sell it and pay the NIA in cash, but if the price is low, they pay in kind (palay) to the NIA.

Manner of Payment of Irrigation Service Fees in 1999

Manner of Payment	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. In-cash	140	46.4	141	70.5	122	61.0	39	19.2	442	48.8
2. In-kind	56	18.5	32	16.0	19	9.5	132	65.0	239	26.4
3. Both (case by case)	30	9.9	6	3.0	21	10.5	0	0.0	57	6.3
4. No payment	76	25.2	21	10.5	38	19.0	32	15.8	167	18.5
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

Reasons for Manner of Payment of ISF

Reasons	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. More convenient to pay cash	114	33.8	28	13.9	63	27.3	63	42.6	268	29.2
2. Depends on the prevailing price	50	14.8	127	62.9	1	0.4	11	7.4	189	20.6
3. Collector prefers cash	70	20.8	8	4.0	40	17.3	3	2.0	121	13.2
4. Regulation of NIA/IA	43	12.8	8	4.0	40	17.3	22	14.9	113	12.3
5. No payment due to crop failure	12	3.6	1	0.5	33	14.3	24	16.2	70	7.6
6. More convenient to pay palay/ easily available	9	2.7	18	8.9	2	0.9	15	10.1	44	4.8
7. There's discount if you pay cash	18	5.3	0	0.0	0	0.0	0	0.0	18	2.0
8. Others	7	2.1	5	2.5	23	10.0	10	6.8	45	4.9
9. No response	14	4.2	7	3.5	29	12.6	0	0.0	50	5.4
Total Samples	337	100.0	202	100.0	231	100.0	148	100.0	918	100.0

2) Conception of ISF

Majority (607 respondents or 70.4%) of the farmers view the ISF as a legitimate expense.

Understanding of ISF

Perceptions on ISF	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Legitimate expenses	139	67.5	184	89.8	110	48.5	174	77.7	607	70.4
2. Kind of levy or tax	60	29.1	9	4.4	48	21.1	33	14.7	150	17.4
3. Not to be paid	2	1.0	1	0.5	0	0.0	5	2.2	8	0.9
4. Others	5	2.4	0	0.0	69	30.4	12	5.4	86	10.0
5, Not applicable	0	0.0	11	5.4	0	0.0	0	0.0	11	1.3
Total Samples	206	100.0	205	100.0	227	100.0	224	100.0	862	100.0

3) Amount Paid in Dry Season

More than half (412 or 53.9%) of the NIS farmers said to have paid the ISF between PHP 501 to 1,000 per hectare during the dry season of 1999. Three fifths of them also claimed to have fully paid the ISF.

If in cash, Amount Paid per ha during Dry Season

Amount (PHP)	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. 500 & below	20	7.6	79	38.7	32	19.4	20	15.2	151	19.8
2. 501-1000	152	57.8	54	26.5	100	60.6	106	80.3	412	53.9
3. 1,001-1,500	46	17.5	54	26.5	3	1.8	6	4.5	109	14.3
4. 1,501-2,000	19	7.2	5	2.5	1	0.6	0	0.0	25	3.3
5. 2,001-3,000	15	5.7	5	2.5	0	0.0	0	0.0	20	2.6
6. 3,001-above	11	4.2	6	2.9	0	0.0	0	0.0	17	2.2
7. No payment	0	0.0	1	0.5	29	17.6	0	0.0	30	3.9
Total Samples	263	100.0	204	100.0	165	100.0	132	100.0	764	100.0

4) Perception of the Socialized ISF Rate

A large majority (700 or 77.3%) of the farmers across all areas think that the ISF is just on a reasonable amount and that the Socialized Irrigation Service Fee (SISF) is very beneficial for them.

Perception If ISF is Reasonable

Perceptions on ISF Amount	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Just reasonable level	234	77.5	172	86.0	139	69.5	155	76.4	700	77.3
2. Relatively high	65	21.5	10	5.0	36	18.0	43	21.2	154	17.0
3. Low level	3	1.0	8	4.0	0	0.0	2	1.0	13	1.4
4. No answer	0	0.0	10	5.0	25	12.5	3	1.5	38	4.2
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

Benefiting from the Socialized Irrigation Service Fee (SISF)

Item	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Yes	220	72.8	155	77.5	147	73.5	175	86.2	697	77.0
2. No	82	27.2	45	22.5	53	26.5	28	13.8	208	23.0
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

Among the benefits derived from the Socialized Irrigation Service Fee (SISF) are: reduced financial obligation and increased household income.

Perceived Result of SISF

Perceived Result	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Reduced financial obligation	229	50.2	169	83.7	111	50.5	133	54.3	642	57.2
2. Increased household income	180	39.5	27	13.4	56	25.5	87	35.5	350	31.2
3. Reduced revenue	41	9.0	2	1.0	4	1.8	24	9.8	71	6.3
4. Others	6	1.3	1	0.5	0	0.0	1	0.4	8	0.7
5. No response/No idea	0	0.0	3	1.5	20	9.1	0	0.0	23	2.0
6. Not applicable	0	0.0	0	0.0	29	13.2	0	0.0	29	2.6
Total Samples	456	100.0	202	100.0	220	100.0	245	100.0	1,123	100.0

When asked on the possibility of termination of SISF, an overwhelming 695 respondents (74.3%) said that they have no choice but to follow whatever the new policy will be.

Action to be Taken if SISF is Terminated

Possible Actions	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Follow new regulation	255	84.4	160	74.4	132	61.4	148	72.9	695	74.3
2. Protest through IA	32	10.6	23	10.7	36	16.7	40	19.7	131	14.0
3. Refuse to pay	13	4.3	6	2.8	3	1.4	10	4.9	32	3.4
4. Others	2	0.7	17	7.9	10	4.7	5	2.5	34	3.6
5. No idea	0	0.0	9	4.2	34	15.8	0	0.0	43	4.6
Total Samples	302	100.0	215	100.0	215	100.0	203	100.0	935	100.0

5) Opinions to Increase ISF Collection

The farmers also think that the following measures are most effective to increase ISF collection: imposition of penalties on non-payment or delayed payment, provision of incentives when paying, and improved water distribution. Farmers across all areas think that provision of incentives and discount to farmers could help a lot to motivate the farmers pay their ISF in the same manner that sanctions should be given to non-paying farmers.

Reasons Cited for Most Effective Measure to Increase ISF Collection

Reasons	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Provision of incentives and discount to farmers	94	31.1	72	36.0	51	25.5	77	37.9	294	32.5
2. Imposed penalty to non paying farmers	52	17.2	43	21.5	37	18.5	35	17.2	167	18.5
3. Increased production	89	29.5	32	16.0	43	21.5	7	3.4	171	18.9
4. Improved water scheduling and distribution	21	7.0	15	7.5	22	11.0	80	39.4	138	15.2
5. Give incentive to IA for collection of ISF	33	10.9	16	8.0	20	10.0	0	0.0	69	7.6
6. Proper maintenance of irrigation facilities	7	2.3	2	1.0	5	2.5	0	0.0	14	1.5
7. Others	6	2.0	15	7.5	19	9.5	4	2.0	44	4.9
8. No response	0	0.0	5	2.5	3	1.5	0	0.0	8	0.9
Total Samples	302	100.0	200	100.0	200	100.0	203	100.0	905	100.0

(5) Membership to Irrigation and Farmers Organizations

1) Majority of the household-respondents are IA members. Very few, however, are members of other farmer organizations.

2) The reasons cited for non-membership include the following: does not know that the association is existing in the area, not interested/no time, IA did not collect membership fee, not yet cultivating the land when IA was organized, farm not covered by the irrigation system, irrigation service does not reach farm, does not own the land and own pump.

(6) Expectations and Recommendations of the Beneficiary Farmers

1) Expectation on NIA Responsibility

Most of the NIS respondents mentioned the following expectations on NIA aside from performing its water management responsibilities: (a) introduction and training regarding new technologies, (b) coordination with other authorities to facilitate loans, (c) consolidation of marketing and transportation systems and (d) consulting services.

Expectation on NIA Responsibility Besides Water Management

Expectations	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Introduction and training of new technologies	133	36.8	152	79.6	67	33.3	146	40.4	498	44.7
2. Consolidation of marketing and trans. System	27	7.5	4	2.1	23	11.4	65	18.0	119	10.7
3. Coordination with other authorities to help us to get loan services	110	30.5	0	0.0	14	7.0	71	19.7	195	17.5
4. Not want the NIA intervention, because we can manage ourselves	5	1.4	1	0.5	13	6.5	0	0.0	19	1.7
5. Equipment rental services	28	7.8	4	2.1	25	12.4	1	0.3	58	5.2
6. Consulting services	38	10.5	0	0.0	0	0.0	59	16.3	97	8.7
7. Others										
8. No comments/No response	20	5.5	10	5.2	39	19.4	19	5.3	88	7.9
9. Not applicable	0	0.0	20	10.5	20	10.0	0	0.0	40	3.6
Total Samples	361	100.0	191	100.0	201	100.0	361	100	1114	100.0

2) Recommendations to Upgrade the Irrigation Facilities

The respondents mentioned the following recommendations: (a) provision of funds for repairs and maintenance of irrigation facilities, (b) joint monitoring of facilities and management of water distribution, (c) regular and proper maintenance of irrigation facilities, (d) conduct of training on modern farming practices including site visits to successful irrigation projects, (e) construction of additional canals and (f) concreting/ desilting of canals. Table below shows the distribution of the recommendations given.

Upgrading of the Operation and Maintenance of the Irrigation Facilities

Recommendations	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Repair desilting & maintenance of irrigation canals/construction of additional canals	86	22.1	72	47.4	0	0.0	16	7.1	174	19.8
2. Use of modern farming technology	37	9.5	18	11.8	0	0.0	88	39.3	143	16.3
3. Regular maintenance of irrigation facilities	94	24.2	9	5.9	0	0.0	11	4.9	114	13.0
4. Allocation of funds for repair & maintenance of irrigation facilities	78	20.1	5	3.3	2	1.8	16	7.1	101	11.5
5. Improved water distribution	26	6.7	2	1.3	0	0.0	33	14.7	61	6.9
6. Others	68	17.5	19	12.5	2	1.8	55	24.6	144	16.4
7. No comments	0	0.0	27	17.8	109	96.5	5	2.2	141	16.1
Total Samples	389	100.0	152	100.0	113	100.0	224	100.0	878	100.0

3) Increase of ISF Collection Efficiency

The following recommendations were stated by the respondents:(a) allocate incentives to IA, (b) improve water distribution and service, (c) reduce ISF rates, timeliness of collection, (d) improve collection strategy, (e) improve irrigation facilities and (f) continue to provide good service to IA and farmers.

ISF Collection Efficiency

Recommendations	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Encourage the farmers to pay ISF	24	7.8	35	19.1	0	0.0	51	17.5	110	11.4
2. Timeliness of collection (during harvest time)	23	7.4	21	11.5	0	0.0	0	0.0	44	4.6
3. Reduce ISF rates	13	4.2	68	37.2	0	0.0	25	8.6	106	11.0
4. Impose penalty to delinquent payers	0	0.0	2	1.1	0	0.0	12	4.1	14	1.5
5. Improve water distribution and services	53	17.2	11	6.0	0	0.0	82	28.1	146	15.1
6. Improve collection strategies	62	20.1	13	7.1	2	1.1	0	0.0	77	8.0
7. Support from the govt. to increase the selling price of palay	5	1.6	0	0.0	0	0.0	0	0.0	5	0.5
8. Close coordination between NIA, LGU and IA	8	2.6	0	0.0	0	0.0	5	1.7	13	1.3
9. Improve irrigation facilities	8	2.6	0	0.0	0	0.0	24	8.2	32	3.3
10. Amnesty for back accounts	0	0.0	0	0.0	2	1.1	8	2.7	10	1.0
11. Maintain provision of good service to IA & farmers	34	11.0	9	4.9	0	0.0	52	17.8	95	9.9
12. Grant incentives to farmers	0	0.0	0	0.0	3	1.7	26	8.9	29	3.0
13. No response	79	25.6	24	13.1	173	96.1	7	2.4	283	29.4
Total Samples	309	100.0	183	100.0	180	100.0	292	100.0	964	100.0

4) Recommendations for Water Management

To strengthen the water management system, the following recommendations were cited: (a) improve water supply and distribution for all areas, (b) proper maintenance and improvement of irrigation facilities, (c) concreting/ repair canal lining, (d) maintain cleanliness of canal, (e) improve present level of operation and (f) desilting of canal.

Water Management

Recommendations	UPRIIS Nueva Ecija		Nayom Bayto Zambales		Aganan Iloilo		Lasang Davao del Norte		Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
1. Improve water supply and distribution for all areas	57	18.9	88	48.6	3	1.7	7	3.0	155	17.3
2. Proper maintenance and improvement of irrigation facilities	30	9.9	19	10.5	0	0.0	24	10.2	73	8.1
3. Concrete/repair lining and maintain cleanliness	67	22.2	14	7.7	0	0.0	126	53.6	207	23.1
4. Strict implementation of policies on water management	8	2.6	0	0.0	0	0.0	10	4.3	18	2.0
5. Adopt modern farming technology through seminar and trainings	2	0.7	4	2.2	0	0.0	30	12.8	36	4.0
6. Improve present level of operation	0	0.0	0	0.0	1	0.6	18	7.7	19	2.1
7. Maintain provision of good services to NIA, IA and farmers	26	8.6	0	0.0	0	0.0	5	2.1	31	3.5
8. No response	97	32.1	56	30.9	176	97.8	0	0.0	329	36.6
9. Others	15	5.0	0	0.0	0	0.0	15	6.4	30	3.3
Total Samples	302	100.0	181	100.0	180	100.0	235	100.0	898	100.0

ATTACHMENT

Attachment III.1 Questionnaire to the Beneficiary Farmers

Questionnaire No. _____

Date: _____

THE STUDY
ON
STRENGTHENING OF NIA's MANAGEMENT SYSTEM

BENEFICIARY FARMERS' INTENTION SURVEY

INSTRUCTIONS

1. Encircle the letter in the Answer Sheet opposite the number correspondent to the number on the Questionnaire or fill up the blank according to the instructions, as per response of the respondent.

2. On descriptive questions, please explain/fully the questions and try to reflect the response of the respondent in the prescribed space.

3. Elicit maximum participation/cooperation of the respondent. Don't leave any numbers blank. All questions should be asked and the respondent should be encouraged to answer which best described his/her opinion to a specific question.

Name of Respondent:		
	Name	**Date**
Interviewed by:		on:
Edited		
a. on field by:		on:
b. final by:		on:
Encoded by:		on:

QUESTIONNAIRE TO THE BENEFICIARY FARMERS
ON
THEIR INTENTIONS TO IMPROVE THE IRRIGATION MANAGEMENT SYSTEM INCLUDING ISF COLLECTION

Questionnaire No. _____

Respondent : _____ *Month* *Day* *Year*
(Name of Respondent) Date : _____ / _____ / _____
Region : _____ Province : _____
City/Municipality : _____ Barangay : _____
IA Name : _____
Membership : _____ Member _____ IA Leader _____ Non-Member
Name of the Irrigation System :

SECTION I: GENERAL INFORMATION

Q1 **Sex:** a. Male b. Female

Q2 **Age:** _____ 2-1 Religion: _____

2-2 Language/ Dialect of daily use: _____

Q3 **Number of household members (dependents):**

3-1 Household members in the same house including the respondent and those living together. _____

SECTION II LIVING ENVIRONMENT AND FARMING CONDITIONS

Q4 **Total annual family income (in 1999)**

a. Farm income (1) PhP _____ / year
b. Non-farm income (2+3+4+5) PhP _____ / year
c. Total Income [a. + b.] PhP _____ / year

Notes: 1 Income from farming activities
2 Employment income
3 Remittance from family member
4 Business income
5 Others

4-1 How do you rate your social status?
a. Rich b. Middle class c. Fairly poor d. Very poor

4-2 Minimum required income to ensure a normal or average living for your family?
a. PhP_____per month b. PhP_____per annum

Q5 Land Tenure

Tenurial	1. Area (ha)			2. No. of parcels			3. Main crops planted		
	Irrigated	Non-Irrigated	Total	Irrigated	Non-Irrigated	Total	Irrigated	Non-Irrigated	Total
a. Owned									
b. Leased									
c. Amortizing									
d. Sharecropper									
e. Others (specify)									
Total									

Q6 If you are leasing land, how and how much do you pay to the land owner? (1999)
(for irrigated only)

a. Fixed amount per year : PhP _____ (wet) / PhP _____ (dry)
b. Annual amount per year : PhP _____
c. Payment in crop (share of harvest): _____% (landowner) vs. _____% (lessee)

6-1 If you are leasing land, what is the arrangement with the land owner regarding leasing terms and farming expenditure?

a. Term (in terms of): _____ years b. Unconditional

6-2 For other forms of ownership, state conditions for farming practices.

a. Owner provides all farming inputs
b. Both share the cost of farming inputs
c. You provide all costs of inputs
d. Others (specify): _____

6.3 Who pays the irrigation service fee?

a. Landowner b. Tenant c. Others (specify) : _____

SECTION III WATER MANAGEMENT AND OPERATION AND MAINTENANCE OF THE IRRIGATION SYSTEM

Q7 Are you satisfied with the water management (irrigation service) of *NIA-Irrigation System Office*? (For CIS, the underlined Italic phrase is to be omitted)

a. Very much satisfied b. Satisfied c. Slightly satisfied d. Not satisfied

7-1 What are the reasons behind your dissatisfaction? (For answers c & d)

a. Inadequate supply of irrigation water
b. Poorly maintained irrigation facilities
c. Lack of information dissemination
d. High irrigation service fee
e. Lack of responsibility and duties of the Irrigation System Office
f. Complicated procedure
g. Unjust policy in granting exemption
h. Weak organization of the Irrigation System Office
i. Others (specify): _____

7-2 Please select and post in order of the frequency or significance.

1	2	3	4	5	6	7	8	9

7-3 How is the training for IA by Institutional Development Officer?
a. Well conducted b. Fairly conducted c. Very poor/not yet conducted
a. Other (specify) : _____

Q8 What is the physical condition of the irrigation facilities in your area?
a. Adequately maintained b. Fairly maintained c. Poorly maintained
d. Not maintained at all

8-1 What problems are prevailing in your irrigation system? (Multiple responses)
a. Low embankment b. Silted canal bottom
c. Erosion in canal d. Problems in turnouts
e. Problems in checkgate f. No measuring devices
g. Lack of terminal facilities h. Others (specify): _____

8-2 From the above problematic causes, post in order of significance (a. to h.)

1	2	3	4	5	6	7	8

Q9 In what farming activity do you encounter water shortage? (Multiple response)
a. Saturation period b. Land soaking period
c. Land preparation period d. Normal irrigation period

9-1 In connection with the above question, write down briefly the difficulties you have encountered.
_____
_____

9-2 What is the flow of the irrigation water at the terminal point?
a. Always adequate flow
b. Inadequate flow during dry season
c. Very limited flow / no water available

Q10 Have you encountered damage resulting in low yield of palay in your area? (in the last 3 years)
a. Yes (causes): _____
_____

b. No

10-1 If yes, did you pay ISF even in such plight?
a. Full amount b. Partial c. No

Q11 How often have you been involved in conflict over the use of water?
a. Never b. Once c. Twice d. Many Times

11-1 If involved, what kind of conflicts have you ever been in? (Multiple responses)
a. Priority in the use of water
b. Schedule of water delivery
c. Lack of communication during time of water distribution
d. Problem on physical facilities
e. Lack of water
f. Drainage problem
g. Destruction of irrigation facilities (embankment, etc.)
h. Others (specify): _____

11-2 Please post the conflicts encountered from the above in the order of frequency.

1	2	3	4	5	6	7	8

SECTION IV IRRIGATION SERVICE FEE (ISF)

Q12 How do you pay irrigation service fees? (1999)

a. In Kind 1_____ cavans per ha in wet season
2 _____ cavans per ha in dry season

1 kg of paddy (NFA buying price): PhP _____ (as of (month & year)_____)
1 kg of paddy (farmgate price): PhP _____(as of (month & year)_____)
1 kg of paddy (market price): PhP _____ (as of (month & year)_____)

b. In Cash 1_____ pesos per ha in wet season
2 _____ pesos per ha in dry season

c. Both (case by case)

12-1 Concerning the above question (12), please write down the reasons.
_____
_____
_____

Q13 What is your understanding of the irrigation service fee? (Multiple responses)

a. Kind of tax or levy
b. Legitimate expenses for the operation and maintenance of the system
c. Not to be paid: because water is free
d. Others (specify): _____

Q14 What were your performance and attitudes about payment of irrigation fees (in last wet and dry seasons)?

a. Full payment b. Partial payment
c. No payment

14-1 What were the reasons for partial payment or non-payment? (Multiple responses)

a. Inadequate supply of irrigation water
b. Lack of delay of information in fee collection
c. Incomplete or unclear bills
d. No sufficient net income to pay irrigation fees
e. Delay of procedure for exemption from irrigation fees
f. No clear arrangement with landowner on payment of irrigation fees
g. Others (specify): _____

Q15 How reasonable is the irrigation service fee?

a. Relatively high b. Just reasonable level c. Low level

15-1 Average yield of palay (cavans/ha) in wet season (1999)

a. below 20 cavans b. 21 - 30 cavans
c. 31 - 40 cavans d.41 - 50 cavans
e. 51 - 60 cavans f. 61 – 70 cavans
g. 71 – 80 cavans h. 81 cavans – up

15-2 Average yield of palay (cavans/ha) in dry season (1999)

a. below 20 cavans b. 21 - 30 cavans
c. 31 - 40 cavans d.41 - 50 cavans
e. 51 - 60 cavans f. 61 – 70 cavans
g. 71 – 80 cavans h. 81 cavans – up

15-3 How much are you willing to pay at the maximum for the ISF?

1 In Kind (cavans/ha):

a. Wet season: _____
b. Dry season : _____

2 In Cash (maximum): _____

a. Wet season : PhP _____ b. Dry season : PhP _____

Q16 What do you think of the socialized irrigation service fee (SISF)?

16-1 Are you benefiting from the socialized irrigation fee system?

a. Yes b. No

16-2 What is the result of the SISF? (Multiple responses)

a. Reduce financial obligation for the small landholding farmers
b. Increase household income
c. Reduced revenue in ISO/PIO leads to poor maintenance
d. Others (specify): _____

16-3 The socialized irrigation service fee was put in force as temporary measure to help the poor farmers mitigate the effects of the latest Asian currency crisis, El Nino, etc. If this special arrangement be terminated, what do you do? (more than one answer to be accepted)

a. Follow new regulation
b. Protest through IA
c. Refuse to pay
d. Others (specify) _____
_____

Q17 Do you think that the payment of irrigation service fee is effective for Operation & Maintenance on *NIA's* irrigation system? (For CIS, the underlined Italic is to be omitted)

a. Yes b. No

17-1 If no, what is the reason?

_____
_____
_____

Q18 In your opinion, what is the most effective measure to increase ISF collection? (one answer only)

a. Incentives to IA/farmers
b. Penalties on non-payment / delayed payment
c. Improved water distribution
d. Others (specify): _____

18-1 Why?

_____
_____

Q19 Have you ever applied for exemption from payment of irrigation service fees?

a. Yes b. Not yet c. Don't know this regulation

19-1 What was the reason? (For those who answer a & b only)

_____
_____
_____

19-2 Did you ever avail of the crop insurance?
a. Yes b. No

For the answers to the above questions (19-2), please state the reasons.

_____
_____

SECTION V IRRIGATORS'/FARMERS' ASSOCIATIONS

Q20 Are you a member of IA?
a. Yes b. No

20-1 If not, what is the reason?

_____
_____

20-2 When was your IA established (year)? _____

20-3 How many members do you have in your IA? _____

20-4 In addition to the IA, are you (or have you been) member to any farmers' organization?

_____
_____
_____

Q21 Where is your Irrigators' Association (IA) located? (For CIS and NIS)
a. Upstream b. Midstream c. Downstream

Q22 How do you rate the performance of the Irrigators' Association in your area in the actual water management implementation? (one answer only)
a. active b. not so much c. inactive d. no comment

22-1 If not so much active or inactive, what are the reasons?

_____
_____

22-2 How do you propose to improve the situation?

_____
_____

Q23 Do you attend meetings on water scheduling, farming practices, etc. with NIA and/or other farmers?
a. Yes b. No

23-1 Attendance to meetings

Kind of meeting	Who conducts the meeting			Frequency of meeting (every month)		
	NIA	IA	CIS	NIA	IA	CIS

Q24 Under what type of contract is your IA with NIA-ISO?

a. Type I (maintenance) b. Type II (ISF collection) c. Type III (turnover)

d. Others (specify): _____

Q25 Share of ISF and Coverage of O/M

25-1 If there is an agreement existing for ISF collection between NIA-ISO and IA, what is the sharing scheme?

a. NIA-ISO _____% b. IA _____%

25-2 Is the ISF collected enough for O/M of IA?

a. Yes b. No

Cost of operation	Amount of Collection	% of Collection/Operation

Q26 Which of the following is the most important factor in the implementation of better water management? (one answer only)

a. good irrigation facilities
b. sufficient water supply
c. delegation of responsibility to farmers' organization
d. Strengthening of Irrigators' association
e. Others (specify):

_____

_____

f. no answer

Q27 Who takes care of the operations and maintenance of the facilities?

(NIA-ISO, IA or Individual farmer?)

a. Secondary canal	NIA	IA	IF	CIS
b. Tertiary canal				
c. Farm ditch				
d. Others (specify)				

Q28 Do you think that the accountability system of your IA is secured? (CIS and NIS)

a. Yes b. No c. don't know/no comment

28-1 Please state the reasons for the above answer (a. or b.).

_____

_____

SECTION VI EXPECTATIONS AND SUGGESTIONS

Questions to the IA Leader (For NIS)

Q29 What do you expect NIA to take a responsibility besides water management? (Multiple responses)

a. Introduction and training of new technologies
   a-1 O/M of the facilities
   a-2 Modern farming practices
   a-3 High Yielding Variety
   a-4 Others (specify) : _____
b. Consolidation of marketing and transportation systems
c. Coordination with other authorities to facilitate us to get loan services
d. Not want the NIA intervention, because we can manage ourselves
e. Equipment rental services
f. Consulting services
g. Others (specify): _____

Q30 What recommendations can you give in Strengthening of NIA's Management System.

30-1 Upgrading of the Operation and Maintenance of the irrigation facilities

_____
_____
_____

30-2 Increase of the ISF collection efficiency

_____
_____
_____

30-3 Water management

_____
_____
_____

SECTION VII Communal Irrigation System (CIS)

Questions to the Farmers in CIS

Q31 What kind of amortization is applied in your system?

a. 10% of construction cost and the remaining within 50 years
b. 30% of payment for construction and no more amortization
c. Others (specify) _____

31-1 In the above case (a.), How many years have passed since its construction
_____ years

31-2 Status of payment?
a. Fully paid b. up to date b. Partially paid c. Stop payment

31-3 Please state the reason. (For answers c & d)
_____
_____
_____

Q32 Irrigation facilities were turned over to IA?

a. Yes (turnover year): _____ b. No

Q33 The ISF collected is enough to cover the cost of operation and maintenance?

a. Yes b. No

33-1 What is the major reason of the above negative answer (b.)?
_____
_____

Q34 How much are needed for amortization and O/M in your area?

a. _____ cavans / ha for amortization
b. _____ cavans / ha for O/M

Thank you very much for your kind cooperation.

APPENDIX IV

SURVEY ON NIA CORPORATE CULTURE

APPENDIX – CHAPTER IV

SURVEY ON NIA CORPORATE CULTURE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

CHAPTER IV SURVEY ON NIA CORPORATE CULTURE

1. Objectives of the Survey

The NIA Corporate Culture Survey (NCCS) was undertaken to get a closer look into the cultural status of NIA corporation in comparison to the first "Organizational and Personnel Survey" conducted in 1990 by ADB Consultants. Results generated by the Survey provided useful data to understand the present conditions and change of NIA culture. Ultimately, this understanding will, among others, enable the JICA Team to formulate management improvement plans that will allow NIA to transform into a viable agency as envisioned in its Vision, Mission, Goals, Objectives, and Targets (VMGOT).

The NCCS aims to :

1) Gather relevant information about NIA's organizational climate/ conditions as experienced and seen by a sample of its staff (Heads of Offices are not included), and

2) Solicit ideas/opinions from the respondents on how to further improve NIA's organizational processes and the development of human resources.

2. Methodology

The NCCS is designated to complement results of the participatory meeting among Managers and other representatives. To facilitate retrieval of the questionnaire from the Regional Offices, a stamped return envelop was attached in each questionnaire (The questionnaire used in the Survey is given in Attachment IV.1). This is to ensure that respondents will immediately mail back the questionnaire in due time. The overall retrieval rate of NCCS was 52% (357 retrieved/ 693 distributed questionnaires) with the following breakdowns by office: (a) 66% (50 out of 76 questionnaires) from Central Office and (b) 53% (307 out of 573 questionnaires) from the Field Offices.

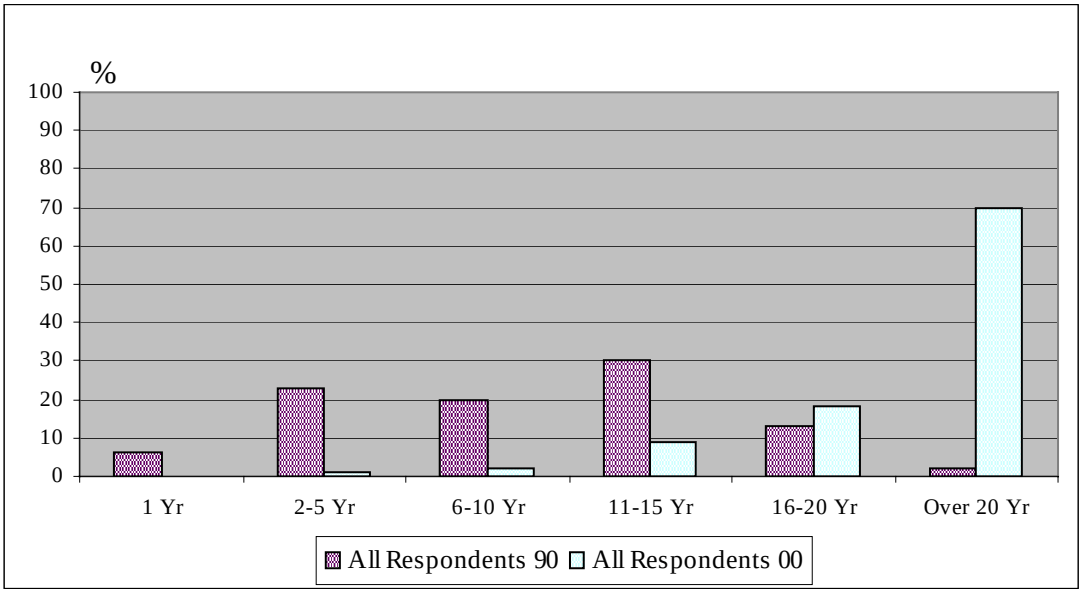
As a similar social survey, an Organizational and Personnel Survey was conducted in 1990 by ADB Consultants among 18,000 NIA personnel nationwide. In this survey, only 16% (about 2,880) were returned. The JICA Study Team attempted in this NCCS to revalidate the data gathered ten years ago to determine the changes during the decade. The NCCS is a follow-up of the 1990 questionnaire which will allow respondents to look into present issues and concerns. The results of comparative studies between ADB Survey in 1990 and JICA-NCCS in 2000 are summarized in Table IV.1.

3. Highlights of the Survey

(1) Length of Services in NIA

An answer to the question on the length of service in NIA revealed that a majority (70%) of the respondents has served NIA for over 20 years. In comparison, only 2% of the respondents in the 1990 Survey belonged to this category.

Length of Service with NIA (1990 and 2000)



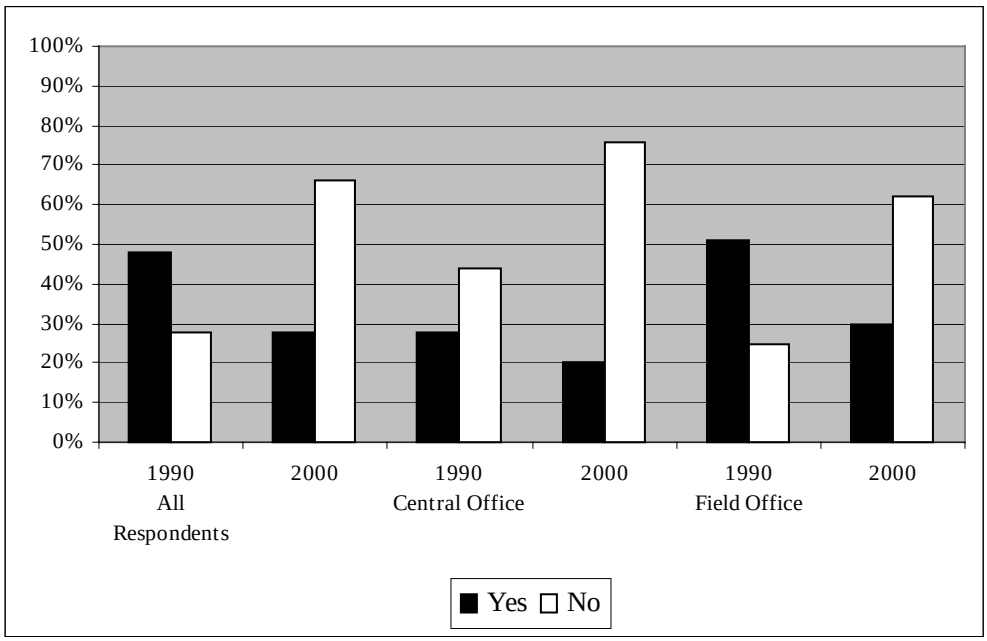
The above graph shows a relatively high percentage (70%) of the NCCS respondents in 2000 Survey belonging to the "over 20 years" service category. This is a natural result of the convergence of the respondents in the 1990 ADB Survey who were in the 6-10 years, 11-15 years, 16-20 years service categories.

(2) Human Resources Development

Generally, respondents from the CO and FO find the system of career development at the NIA is "inadequate" as evidenced by 20% drop in the affirmative answers and consequent rise in negative remarks by 38%. Both gender of respondents in the CO and FO are consistent in their answers – career development system is not adequate (see Table 7.6, Item No.13 for details).

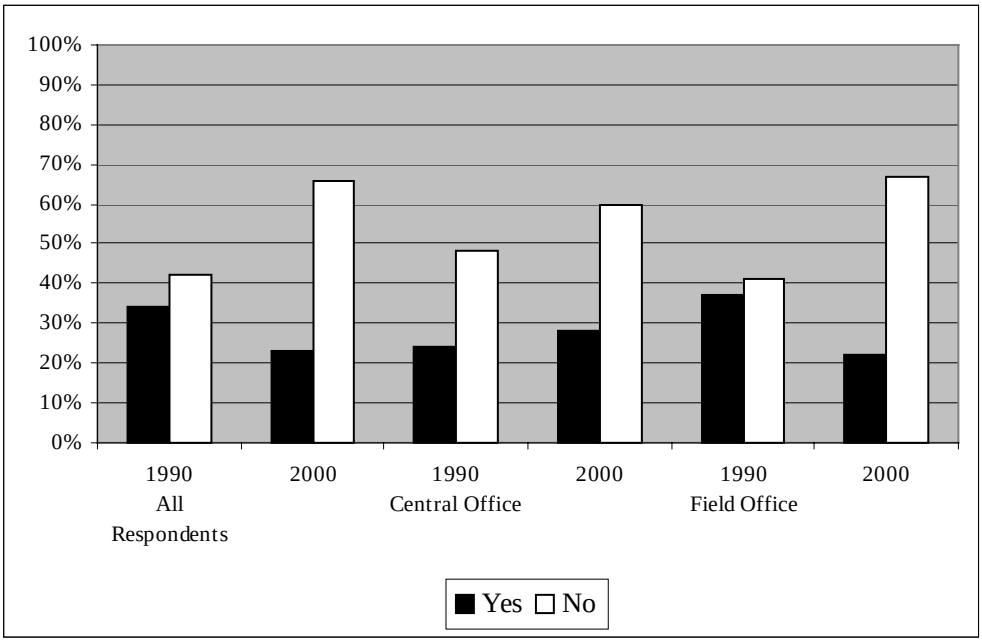
Among NCCS respondents in 2000 Survey, "yes" responses even significantly decreased, i.e., unavailability of personnel/ professional development (-14%), unfair performance appraisal system (-20%), unavailability of training opportunities (-14%), inadequate or absence of career development system (-20% points), and unfair promotion system (-11 %) (see Table IV.1, Items No.10, 11, 12, 13, and 14 for details).

NIA's Current Career Development System is Adequate ?



The following figure shows that a majority (66%) of the respondents in the 2000 Survey, both men and women from the CO (60%) and FO (67%), observes that the current promotion system is "not fair nor equitable".

NIA's Current Promotion System is Fair and Equitable ?

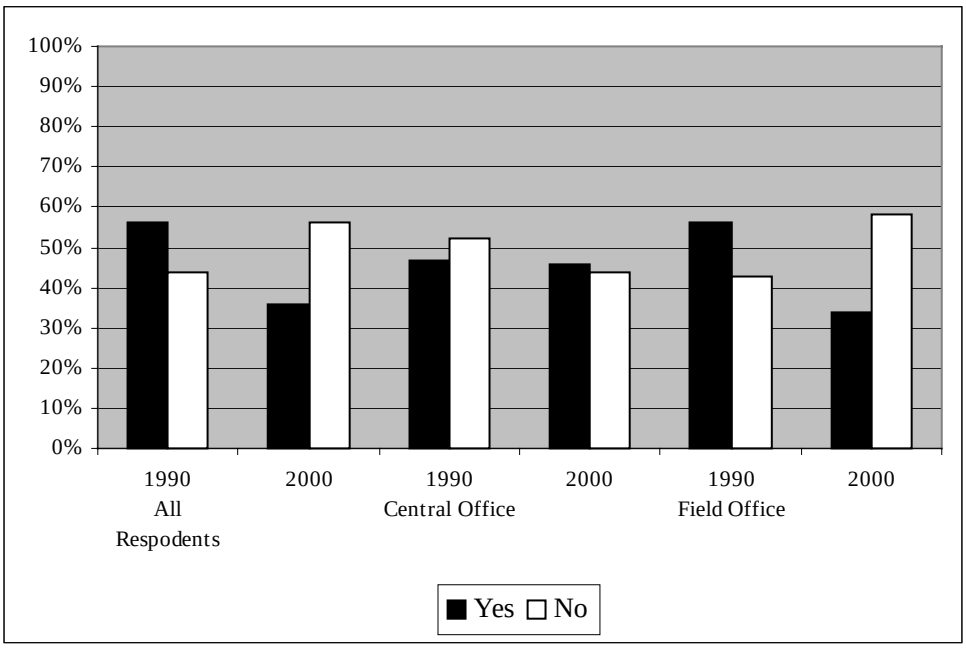


(3) Number of Skilled and Competent Staff

To the question : "Your work unit has sufficient number of skilled and competent staff to do assigned work ?", 56% of the respondents gave the negative (No) answers. The result of NCCS

in 2000 indicated the reverse outcome against that of ADB Survey in 1990, particularly contrast one in the Field Office, as shown the following figure.

Sufficient Number of Skilled and Competent Staff in Your Office ?

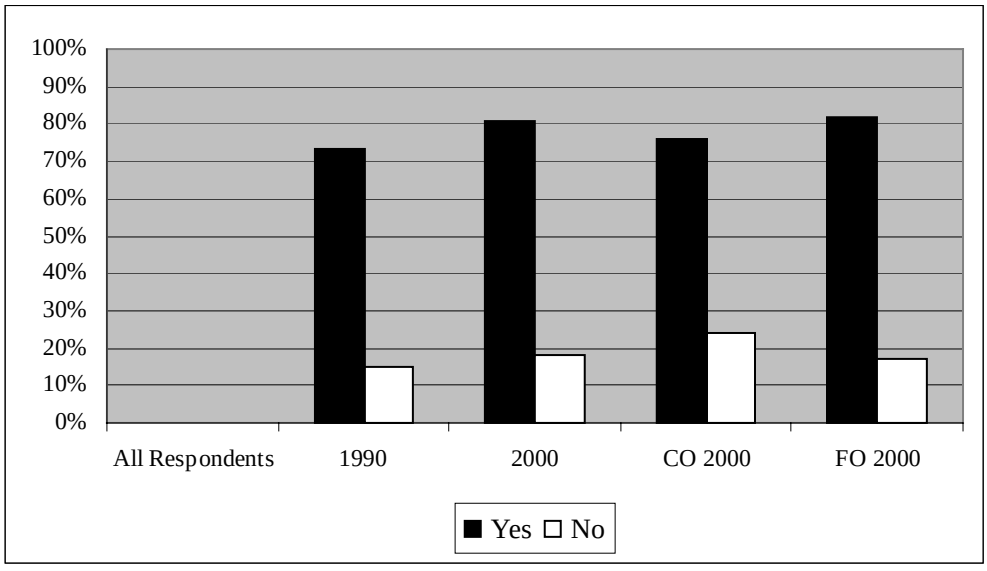


The Survey results indicate that NIA is experiencing brain-drain (-20%). Or, a number of competent staffs has already left the service.

(4) Employees' Attitude

A total of 81% respondents that shows an increase of +8% points from 1990 (73%), asserted that other units are conscientious and hardworking. There was 18% of "No" answers or with an increase of 3% points from 15% in 1990.

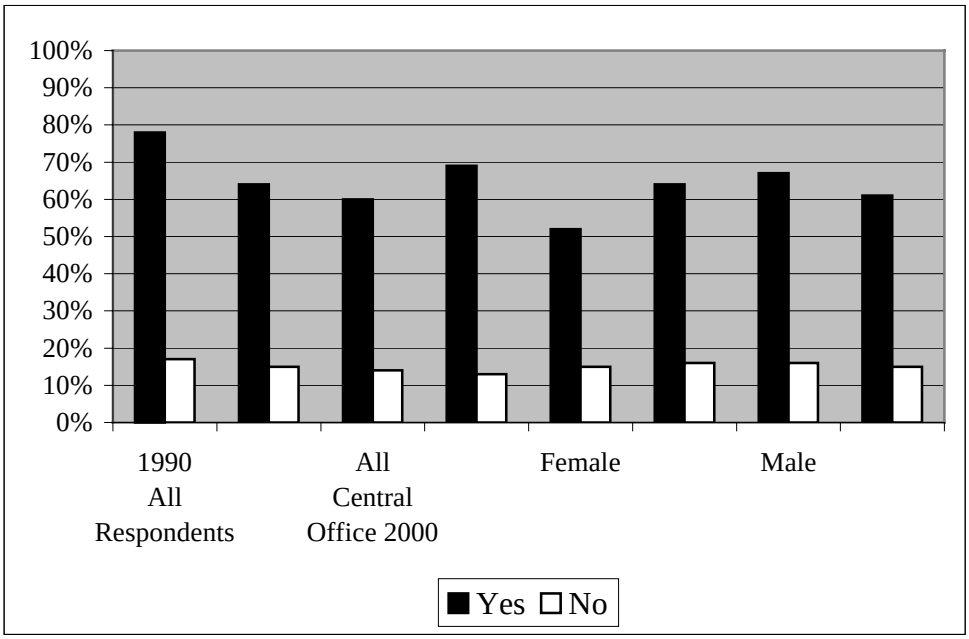
People with Whom You Coordinate in Other NIA Work Units are Conscientious and Hardworking ?



(5) Supervisors' Capability

In the 2000 Survey, 64% of the respondents made the positive responses that their supervisors are competent and considerate. This is, however, 14% lower than the outcome (78%) in the 1990 Survey.

Your Supervisor is Both Competent and Considerate ?

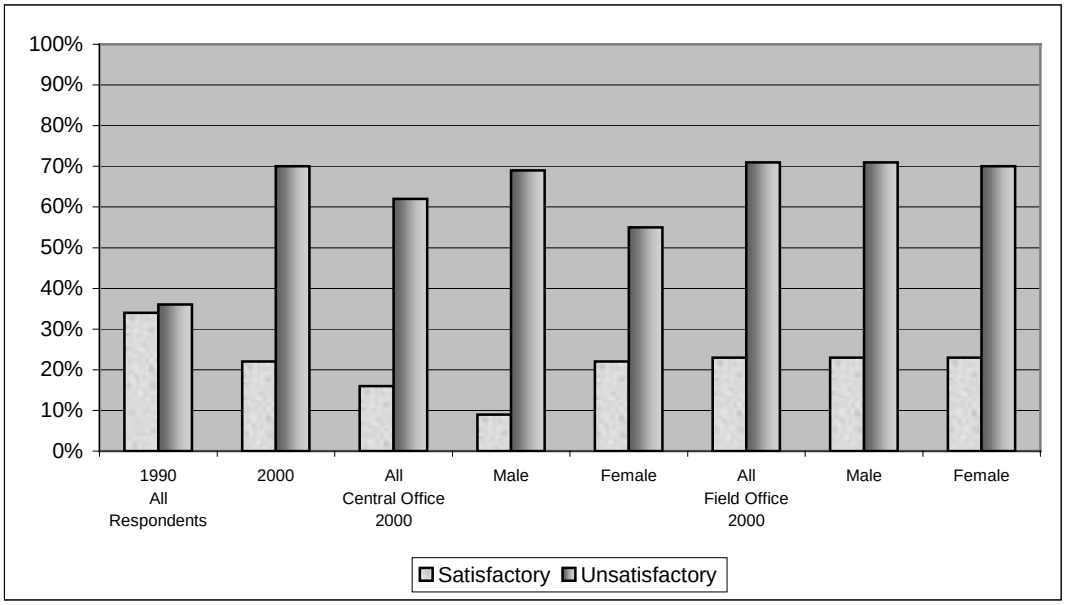


(6) Shortages of Equipment and Supplies

The 1990 Survey showed a low level (34%) of satisfaction in terms of equipment and supplies. This went much lower (22%) in the 2000 Survey. While it is apparent that most of the 1990 respondents were passive (only few respondents answered this particular item) in this area, 70% of the 2000 Survey respondents expressed their "dissatisfaction".

The employees stated that they are not only demoralized due to the above, but also has difficulty achieving his/her objectives due to unavailability of equipment and lack of office supplies.

Sufficient Equipment and Supplies Readily Available ?

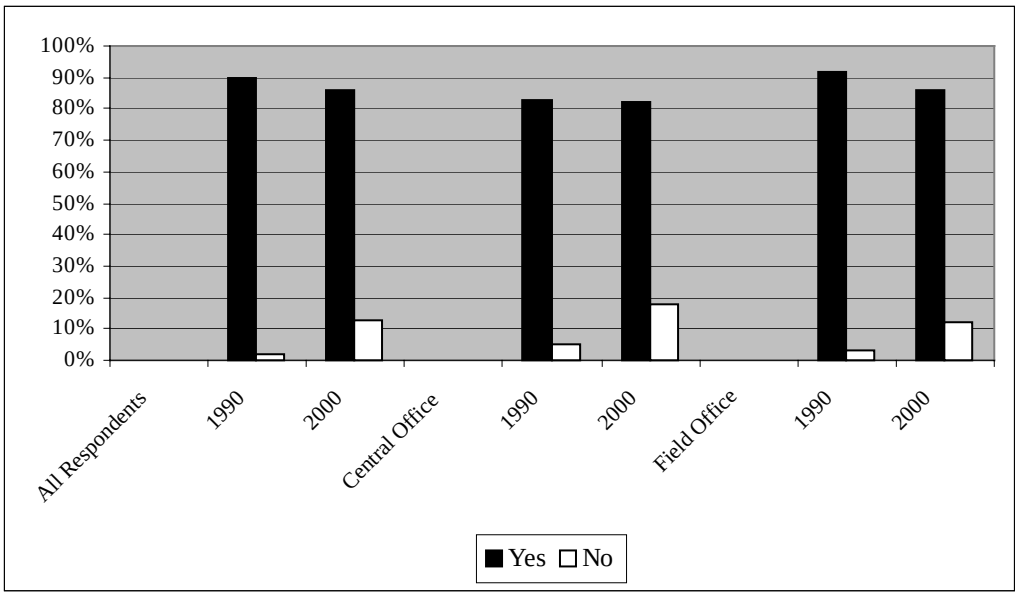


(7) Loyalty/ Pride

A great majority of the respondents from the CO (82 %) and FO (86 %) remain proud to be member of the NIA family, in spite of the increase of chagrined members from 2% (1990) to 13% (2000), respectively. In the 2000 Survey, there are more chagrined personnel at the CO (18 %) than the FO (12%).

As such kind of psychological factor among the employees seriously acts on the promotion of the restructuring plan, there is a need to take a serious look into their plight.

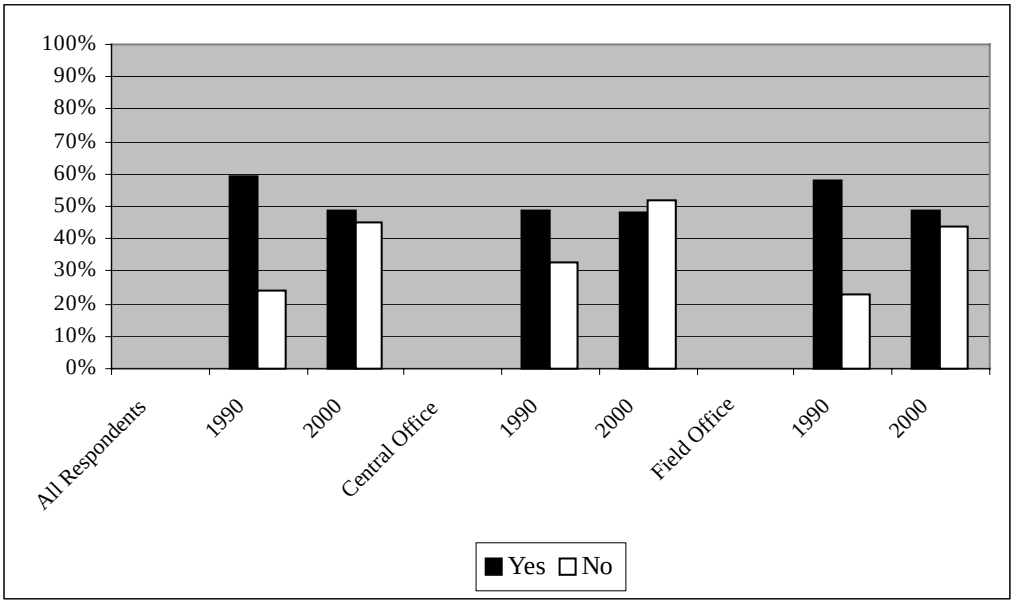
Are You Proud to be Member of the NIA Team and Prefer to Stay with NIA ?



(8) Dynamism/ Flexibility

Ten years ago, 59% of NIA personnel preferred to stay in their work units (NIA), as shown in the following figure. Today, they are lesser in number at 49%, and those who do not want to stay "fixed" have almost doubled (45%) against 24% in 1990. In both Surveys, FO personnel has consistently preferred to be where they are, while the CO personnel maintained their stance at the other side of the fence or unwillingness to go to parts other than what they are already used to.

Do you Accept Transfer to Other Job if There is a Chance ?



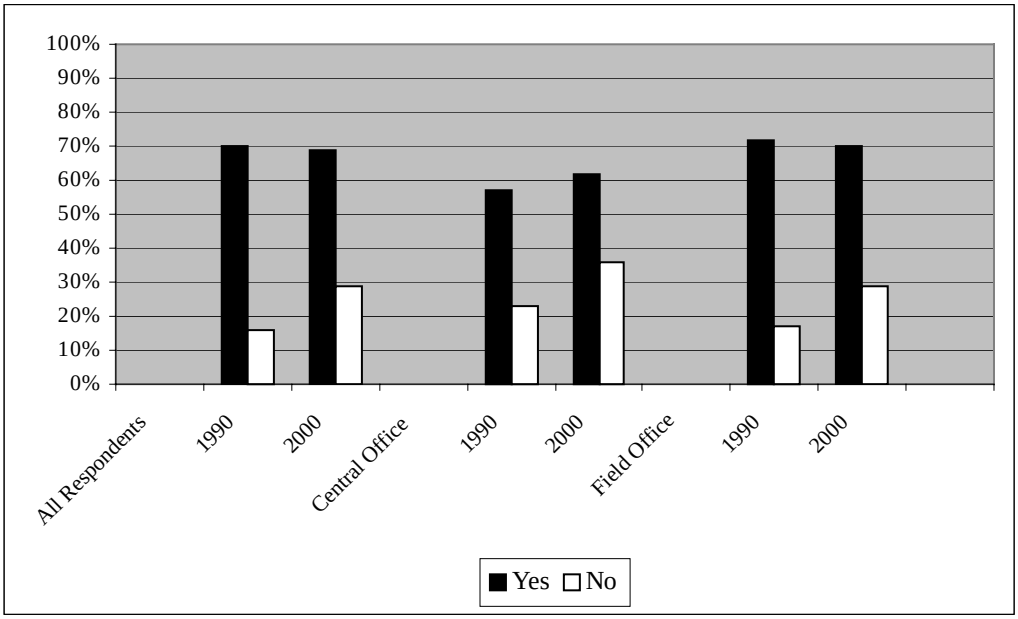
Employees would no longer like to be reassigned or transferred unless there is equivalent promotion, salary increase, and additional traveling allowance – this item also significantly decrease by 10% (refer to Table IV.1: Comparative Figures in Number of Respondents - ADB Survey in 1990 and NCCS in 2000).

(9) NIA's Reputation

In the 2000 Survey, 69% of the respondents agreed that NIA has very favorable reputation. However, this is 1% lower than in 1990 (70%). While positive responses from the CO increased from 57% to 62%, the "No" responses likewise increased from 23% to 36%.

As for the results from the FO, the number of employees who believe that NIA has favorable reputation decreased slightly from 72% to 70%, while non-believers went up from 17% to 29%.

NIA's Reputation in the Local Community is Very Favorable ?



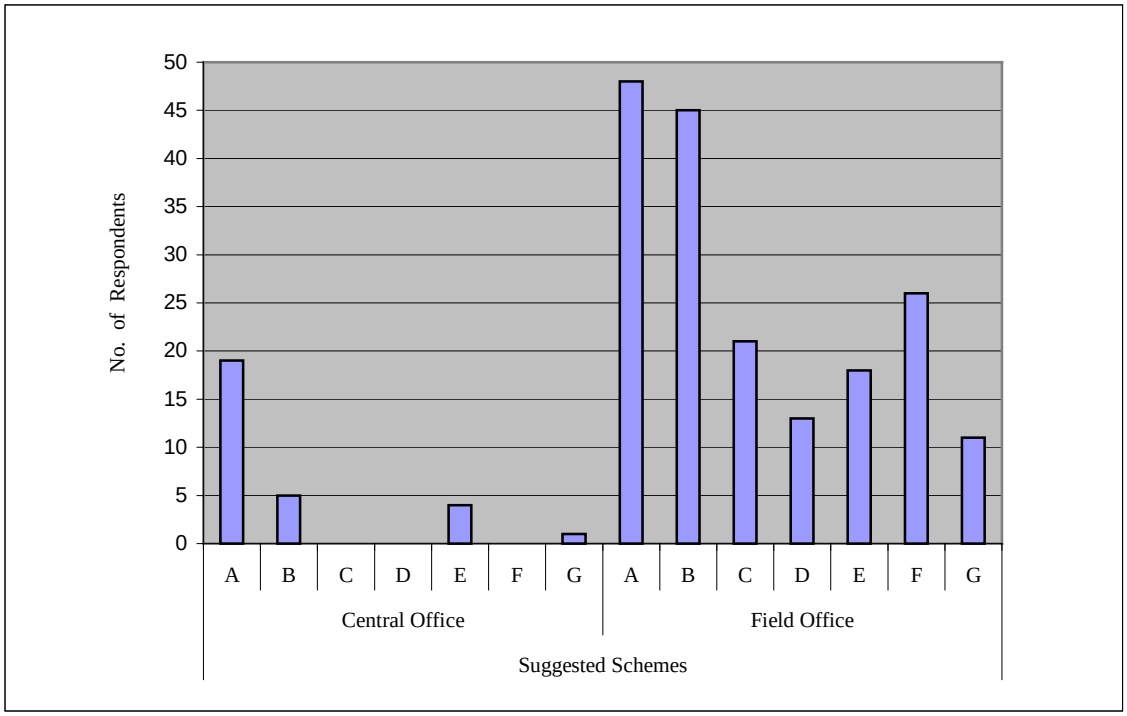
(10) Expected Conditions for Early Retirement

Eighteen (18) CO respondents suggested that NIA offer two (2) months of salary for every year of service.

As to opinions of FO respondents, forty eight (48) gave their expectations for every YOS: two (2) months of salary and forty five (45) for 2.5 months of salary, while twenty six (26) suggested to avail under RA 8291.

A total of 123 respondents or 60% (out of 357 retrieved questionnaires) are willing to avail of ERP on the condition that the package of benefits is attractive and paid immediately.

Should the Streamlining be Pushed through, What Early Retirement Would You Recommend?



Legend:

A – 2 mos./YOS
B – 2.5 mos. salary/YOS
C – 3 mos. salary/YOS
D – 1.5 mos./YOS
E – Avail of / under RA 1616

Any official or employee, appointive or elective, regardless of age and employment status is eligible to retire subject to the following conditions: (a) Must have rendered service prior to 1 June 1977, (b) At least 20 years of service in aggregate, (c) Last three years of service must be continuous, and (d) Gratuity benefits to be computed based on the highest salary received and number of gratuity months.

F – Avail of / under RA 8291

The retirement benefit, to be paid by the Government Service Insurance System, is either one of the following: (a) The lump sum equivalent to 60 months of the basic monthly pension payable at the time of retirement, plus and old-age pension benefit equal to the basic monthly pension payable for life, starting upon the expiration of the five-years covered by the lump sum; or (b) A cash payment equivalent to 18 times of the employee's basic monthly pension plus monthly pension for life payable immediately.

G – Graduated: Years in service = 1-3 months salary/YOS

1 to 5 YIS = 1 mo. salary/YOS
6 to 10 YIS = 1.25 mo. salary/YOS
11 to 15 YIS = 1.50 mo. salary/YOS
16 to 20 YIS = 2 mo. salary/YOS
20 YIS = 2 mos. salary/YOS
25 YIS = 2.5 mos. salary/YOS
30 YIS = 3 mos. salary/YOS

YIS – Years in Service YOS – Years of Service

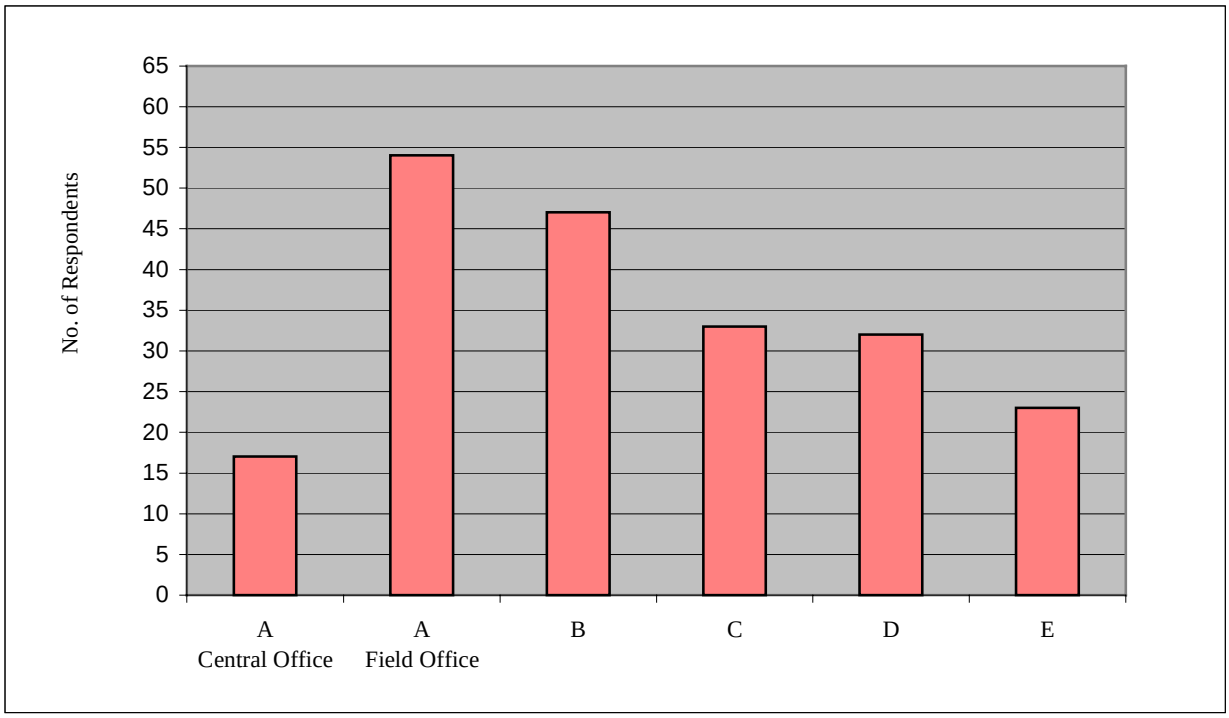
Notes:

- Above suggested schemes are not the same since each respondent has different suggestions.
- FO respondents contributed more suggestions compared to their CO respondents.

(11) Conditions for Relocation/ Reassignment

Among CO respondents, seventeen (17) said they will accept transfer if the Agency gives more benefits or increased salary/ allowances. Among the FO respondents on the other hand, fifty four (54) said likewise the item A, while forty seven (47) indicated such expectations as: if they get promoted, followed by thirty three (33) for salary increase, and thirty two (32) for preference to retire.

In Case You/ Your Position is Transferred to the Region or Provincial Office as a Result of the Streamlining, What Conditions/ Packages Do You Consider Favorable/ Acceptable for Both You and NIA?



Legend:

A – More benefits/increase salary/allowances
B – If promoted
C – Salary increased
D – I prefer to Retire
E – Present Position is also carried

Notes:

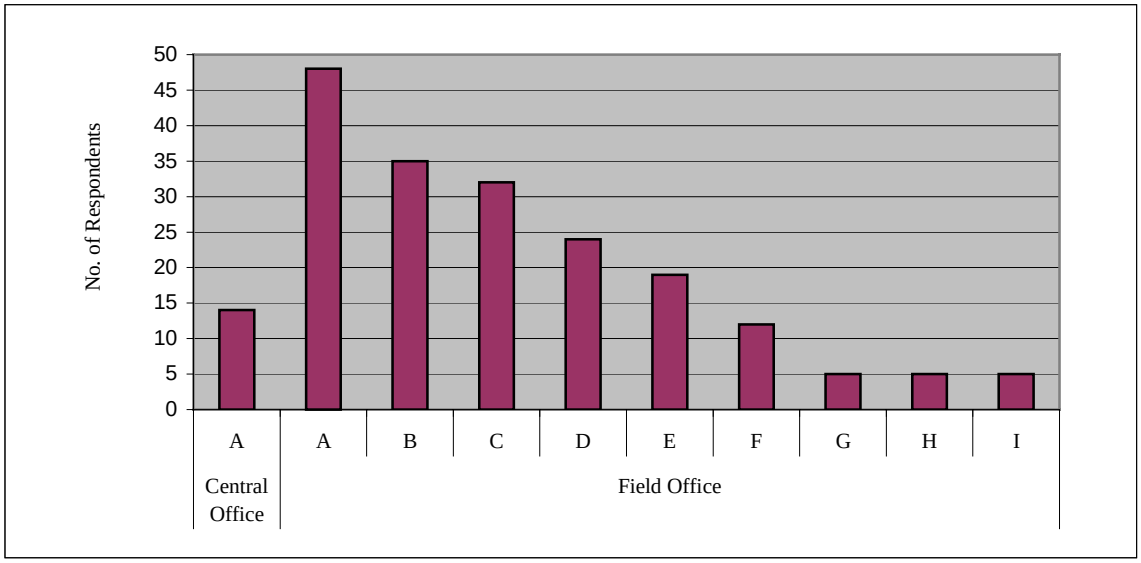
- Above suggested schemes are not the same since each respondent has different suggestions.
- FO respondents contributed more suggestions compared to their CO respondents
- Suggestions with 5 or more respondents are shown in the table.

(12) Suggestions on How to Strengthen NIA's Management

Among CO respondents, fourteen (14) suggested a combination of remarks such as "top management's honesty, sincerity, concern for the rank and file employees, love for the agency, guts and courage to fight political pressure/graft and corruption".

Several suggestions came from the FO respondents: Forty eight (48) said likewise indicated the item A, followed by thirty five (35) for "remove of corrupted officials", thirty two (32) for "payment of salaries/ benefits on time", twenty four (24) for "regular conduct trainings" and nineteen (19) for "request of more subsidy from national government".

Please give Suggestions on How to Strengthen NIA's Management System.



Legend:

A - Top Management's Honesty, Sincerity, Concern for the Rank and File Employees, Love for the Agency, Guts and Courage to fight political pressure/graft and corruption.
B – Remove Corrupt Officials
C – Pay salaries/benefits on time
D – Conduct Trainings Regularly
E – Request more subsidy from National Government
F – Give Attention to Employees' benefits/Listen to Employees
G – Remove Non-performers/Inefficient Employees
H – NIA Must Maintain its viability
I – Promotion Must Be Based on Merit and Performance

Notes:

- Above suggested schemes are not the same since each respondents have different suggestions.
- FO respondents contributed more suggestions compared to their CO respondents.
- Suggestions with 5 or more respondents are shown in the table.

(13) Conclusive Findings and Others

As a whole, respondents in the NCCS gave “negative” responses to the NIA’s current corporate issues, such as personal/ professional development, training opportunities, career development, promotion, supervisors competence and values, satisfaction on equipment/ office supplies, and even NIA’s reputation in the local communities.

Information gathered through this Survey revealed that a majority (70%) of the respondents are already of retiring age. In comparison, only 2% of the respondents in the 1990 Survey were retirables. The aging problem of NIA staff poses one of critical issues to be solved in preparing the restructuring plan. To upgrade and sustain its technical level and quality of service, it is apparent that engagement of the new competent staff needs to be considered subsequent to or even in parallel with implementation of the retirement program.

In addition, a significant number of respondents revealed that delay in payment of salaries and wages in the PIOs/ NISOs ranges from 2 to 9 months.

TABLES

Table IV.1 Comparative Figures Between ADB 1990 and NCCS 2000 Surveys (1/3)

(Percentage Increase or Decrease (+/-) 1990 - 2000)

No.	Questions	Number of Respondents						YES (%)									NO (%)								
		All		Central Office (CO)		Field Office (FO)		All Respondents			Central Office (CO)			Field Office (FO)			All Respondents			Central Office (CO)			Field Office (FO)		
		1990	2000	1990	2000	1990	2000	1990	2000	% pts. (+/-)	1990	2000	% pts. (+/-)	1990	2000	% pts. (+/-)	1990	2000	% pts. (+/-)	1990	2000	% pts. (+/-)	1990	2000	% pts. (+/-)
1.	NIA's vision, Mission, Goals, Objectives, and Targets are clearly stated (VMGOT)	2,424	352	290	50	2,033	302	94	94	M	92	88	-4	96	95	-1	5	6	+1	2	10	+8	2	4	+2
2.	Everyone in my work unit is knowledgeable about NIA's VMGOT.	*	350	*	50	*	300	NA	70	-	NA	67	-	NA	74	-	NA	29	-	NA	33	-	NA	35	-
3.	I understand my job, roles, and relationship with other personnel & functional units in NIA and other agencies.	2,439	354	Δ	50	Δ	304	97	100	+3	ND	100	-	ND	100	-	3	0	-3	ND	0	-	ND	0	-
4.	Everyone in my work unit understand his/her job, roles and relationship to other individuals and functional units in NIA & other agencies	*	353	*	50	*	303	NA	84	-	NA	80	-	NA	85	-	NA	15	-	NA	20	-	NA	8	-
5.	I have adequate knowledge, skills and/or experience to perform my duties.	2,432	355	Δ	50	Δ	305	96	100	+4	ND	100	-	ND	100	-	4	0	+4	ND	0	-	ND	0	-
6.	My immediated co-workers and other technical personnel in particular have adequate knowledge, skills and/or experience to perform their duties.	*	295	*	40	*	255	NA	65	-	NA	64	-	NA	65	-	NA	18	-	NA	16	-	NA	18	-
7.	I have a workload comparable to my co-workers	2,410	348	Δ	48	Δ	300	67	90	+23	NA	80	-	NA	91	-	23	10	-13	NA	16	-	NA	8	-
8.	My personal grade/salary is in accordance with the Salary Standardization Law.	2,418	350	289	50	2,067	300	56	90	+34	33	96	+63	47	89	+42	35	9	-26	45	4	-41	33	9	-24
9.	I have sufficient authority in my present position to do an effective job.	2,424	344	Δ	43	Δ	301	86	85	-1	ND	80	-	ND	87	-	11	13	+2	ND	13	-	ND	12	-
10.	Opportunities are available for personal/professional development in NIA	2,384	347	288	46	2,039	301	64	50	-14	33	96	-63	67	51	-16	25	46	+21	45	4	+41	23	48	+25
11.	NIA's current Personnel Performance Appraisal is fair.	2,400	197	290	50	2,052	147	52	39	-13	31	84	+53	53	30	-23	28	17	-11	35	16	-19	28	17	-11
12.	Training opportunities are available to all NIA employees.	Δ	306	286	44	2,052	262	44	33	-14	32	18	-14	57	43	-14	41	55	+4	52	68	+16	30	43	+13
13.	NIA's current Career Development System is adequate	2,382	329	287	48	2,038	281	48	28	-20	28	20	-8	51	30	-21	28	66	+38	44	76	+32	25	62	+37
14.	NIA's current Promotion System is fair and equitable.	2,392	325	290	44	2,044	271	34	23	-11	24	28	+4	37	22	-15	42	66	+24	48	60	+12	41	67	+26

Table IV.1 Comparative Figures Between ADB 1990 and NCCS 2000 Surveys (2/3)

(Percentage Increase or Decrease (+/-) 1990 - 2000)

No.	Questions	Number of Respondents						YES (%)									NO (%)								
		All		Central Office (CO)		Field Office (FO)		All Respondents			Central Office (CO)			Field Office (FO)			All Respondents			Central Office (CO)			Field Office (FO)		
		1990	2000	1990	2000	1990	2000	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.
15A.	My work unit has sufficient number of skilled and competent staff to do assigned work.	2,206	326	273	45	1,933	281	56	36	-20	47	46	-1	56	34	-22	44	56	+12	52	44	-8	43	58	+15
15B.	Overstaffed/Understaffed							(O) 6	2	-4	(O) 3	2	-1	(O) 7	2	-5	(U) 54	57	+3	(U) 46	48	+2	(U) 35	59	+27
16.	My immediate co-workers meet all the minimum requirements of their position	*	355	*	50	*	305	NA	86	-	NA	92	-	NA	85	-	NA	14	-	NA	8	-	NA	15	-
17.	My immediate co-workers are conscientious and hardworking	2,388	355	Δ	50	Δ	305	80	77	-3	ND	76	-	ND	77	-	12	23	+11	ND	24	-	ND	13	-
18.	My co-workers are honest & can be relied upon	2,403	354	Δ	49	Δ	305	78	78	M	ND	84	-	ND	78	-	13	22	+9	ND	13	-	ND	23	-
19.	Co-workers help each other when necessary	2,389	351	Δ	48	Δ	303	83	91	+8	ND	92	-	ND	91	-	14	8	-6	ND	3	-	ND	9	-
20.	Co-workers are authorized to assume my/others' responsibilities and continue processing work during my/ others' absence	2,393	352	Δ	20	Δ	302	73	79	+6	ND	90	-	ND	76	-	27	20	-7	ND	6	-	ND	13	-
21.	People with whom I coordinate in other NIA work units are conscientious and hardworking.	2,395	353	Δ	50	Δ	303	73	81	+8	ND	77	-	ND	82	-	15	18	+3	ND	23	-	ND	18	-
22.	My Superior values competence & high performance as she/he gives guidances, sets start and completion dates for work, and holds.	2,427	314	Δ	43	Δ	271	79	73	-6	ND	70	-	ND	73	-	16	15	-1	ND	16	-	ND	15	-
	- Periodic reviews of performance;	*	217	*	27	*	190																		
	& Regular section/division meetings	*	202	*	21	*	181																		
23.	My Superior is both competent and considerate as he/she;	2,434	281	Δ	37	Δ	244	78	64	-14	ND	60	-	ND	64	-	17	15	-2	ND	14	-	ND	16	-
	- Encourage me/us to use my/our initiatives	*	238	*	34	*	204																		
	- Gives recognition for good work;	*	190	*	30	*	160																		
	- Assistance whose difficulties are encountered;	*	223	*	30	*	193																		
	- Takes positive action on suggestions/complaints; and,	*	213	*	28	*	185																		
	- Reminds/reprimand us for our flagrant violations/shortcomings.	*	212	*	25	*	187																		
24.	We have sufficient equipment & supplies readily available (If No, pls. check, we have shortages of	2,235	326	284	39	1,951	287	(S) 34	(S) 22	-12	ND	(S) 17	-	ND	(S) 23	-	(U) 36	(U) 70	+34	ND	(U) 63	-	ND	(U) 71	-
	a. Equipment		229		35		194																		
	b. Supplies		184		28	156																			
	c. Equipment needing repair.		214		26	188																			

Table IV.1 Comparative Figures Between ADB 1990 and NCCS 2000 Surveys (3/3)

(Percentage Increase or Decrease (+/-) 1990 - 2000)

No.	Questions	Number of Respondents						Y E S (%)									NO (%)								
		All		Central Office (CO)		Field Office (FO)		All Respondents			Central Office (CO)			Field Office (FO)			All Respondents			Central Office (CO)			Field Office (FO)		
		1990	2000	1990	2000	1990	2000	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.	1990	2000	% pts.
25.	I get sufficient feedback from various sources to know the impact of my work on NIA's operation	2,371	342	Δ	46	Δ	296	60	68	+8	ND	64	-	ND	69	-	29	28	-1	ND	18	-	ND	18	-
26.	I am proud to be a member of the NIA Team. I prefer to stay w/ NIA	2,395	350	287	50	2,050	303	90	86	-4	83	82	-1	92	86	-6	2	13	+11	5	18	+13	3	12	-9
27.	I would readily accept transfer to other job if there is a chance	*	334	*	50	*	284	59	49	-10	49	48	-1	58	49	-9	24	45	+21	33	52	+19	23	44	+21
28.	I am satisfied with our working condition	*	339	*	49	*	290	NA	59	-	NA	66	-	NA	58	-	NA	36	-	NA	12	-	NA	17	-
29.	After working hours, NIA has a regular adequate social/recreational program for its employees other than Christmas/Corporate Anniversary celebrations.	2,340	350	Δ	50	Δ	300	29	31	+2	ND	42	-	ND	29	-	63	67	+4	ND	56	-	ND	59	-
30.	NIA's reputation in the local community is very favorable?	2,386	349	285	49	2,043	300	70	69	-1	57	62	+5	72	70	-2	16	29	+13	23	36	+13	17	2	+12
31.	Have your heard about NIA's Streamlining Scheme? If No, kindly share your thoughts/suggestions re: Realistic Streamlining Scheme.	*	338	*	46	*	292	Not asked in the 1990 survey except 35. These questions are open-ended.																	
32.	Is your Employee's Association responsive to the needs of the members? Kindly suggest on how to strengthen the Association.	*	306	*	39	*	267	Not asked in the 1990 survey except 35. These questions are open-ended.																	
33.	Should the streamlining be pushed thru, what Early Retirement Scheme would you recommend>	*	337	*	36	*	301	Not asked in the 1990 survey except 35. These questions are open-ended.																	
34.	In case you/your position is transferred to the Region or Prov'l. Office as a result of the streamlining, what conditions/packages do you consider favorable/acceptable for both you & the NIA?	*	271	*	29	*	242	Not asked in the 1990 survey except 35. These questions are open-ended.																	
35.	Please give your suggestions/on how to strengthen NIA's Management System?	ND	386	ND	22	ND	364	Enumeration of Respondents Suggestion																	

Abbreviations:

(O) - Overstaffed
(U) - Understaffed
U - Unsatisfactory
S - Satisfactory
NA - Not Asked
ND - No Data Showed in the 1990 Survey
* Not covered by ADB Organizational and Personnel Survey in 1990
? Not showed by ADB Organizational and Personnel survey in 1990
M % point maintained

ATTACHMENT

Attachment IV.1 Questionnaire of NIA Corporate Culture Survey (NCCS)

Position Title : _____ Sex: M ____ F ____ (Pls.√)
Section/Division/Department/Province/Region:_____
_____
Employment Status: _____ Years in Service: _____

Instructions:

For Central Office respondents: Upon completion, please return this questionnaire immediately to JICA Study Team, 2F IEC Bldg.

For Regional Office respondents: Upon completion, please mail back the questionnaire immediately using the self-address stamped envelop.

- Head/Chief of Offices may allow others willing to participate in the survey. Questionnaire may be photocopied for them.
- Use additional sheet of paper if necessary or use back of questionnaire to write your responses.

Please choose one appropriate answer:

Y : Yes
O : Often (Frequently/Most of the time)
N/Nt : No/Not (Pls. Explain briefly reason why)
NC : No Comment

_____ 1. NIA's Vision, Mission, Goals, Objectives, Targets are clearly stated.
_____ 2. I understand my job, roles, and relationship with other personnel and functional units in NIA and other agencies.
_____ 3. I have adequate knowledge, skills and/or experience to perform my duties.
_____ 4. I have a workload comparable to my co-workers.
_____ 5. My personal grade/salary is in accordance with the Salary Standardization Law.
_____ 6. I have sufficient authority in my present position to do an effective job.
_____ 7. Opportunities are available for personal/professional development in NIA.
_____ 8. NIA's current Personnel Performance Appraisal System is _____ fair; _____ understood by all employees' _____ regularly conducted; _____ performance standards are set;
_____ 9. Training opportunities are available to all NIA employees. The most recent I attended was in (date) : _____
_____ 10. NIA's current Career Development System is adequate.
_____ 11. NIA's current Promotion System is fair and equitable. My recent promotion was in (date): _____
_____ 12. My work unit has sufficient number of skilled and competent staff to do assigned work. (If No, please check, we are a:_____Overstaffed b_____Understaffed)
_____ 13. Everyone in my work unit is knowledgeable about NIA's Vision, Mission, Goals, Objectives, Targets.
_____ 14. My immediate co-workers and other technical personnel in particular have adequate knowledge, skills and/or experience to perform their duties:
_____Technical (Irrigation Devt.) _____Supervisors _____ Managers
_____Technical Standards/Specifications are established_____Co-workers
_____ 15. Everyone in my work unit understands his/her job, roles and relationship to other individuals and functional units in NIA and other agencies.
_____ 16. My immediate co-workers meet all the minimum requirements of their position.

_____ 17. My immediate co-workers are conscientious and hard working;
_____ 18. My immediate co-workers are honest and can be relied upon;
_____ 19. My immediate co-workers help each other when necessary;
_____ 20. My immediate co-workers are authorized to assume my/others' responsibilities and continue processing work during my/others' absence.
_____ 21. People with whom I coordinate in other NIA work units are conscientious and hard working.
_____ 22. My Supervisor values competence and high performance as he/she gives guidance, sets start and completion dates for work, and holds:
_____ periodic reviews of performance,
_____ regular section/division meetings.
_____ 23. My Supervisor is both competent and considerate as he/she:
_____ encourages me/us to use my/our initiatives,
_____ gives recognition for good work,
_____ assistance where difficulties are encountered,
_____ takes positive action on suggestions/complaints, and
_____ reminds/reprimand us for our flagrant violations/shortcomings.
_____ 24. We have sufficient equipment and supplies readily available.
(If No, please check (√),
we have shortages of a: ____ equipment
b: ____ supplies
c: ____ equipment needing repair
_____ 25. I get sufficient feedback from various sources to know the impact of my work on NIA's operation.
_____ 26. I am proud to be a member of the NIA Team. I prefer to stay with NIA.
_____ 27. I would readily accept transfer to other job if there is a chance.
_____ 28. I am satisfied with our working condition. (If No, with what aspect are you discontented? _____.
_____ 29. After working hours, NIA has a regular adequate social/recreational program for its employees other than Christmas / Corporate Anniversary celebrations.
_____ 30. NIA's reputation in the local community is very favorable.
31. Have you heard about NIA's Streamlining Scheme? _____. If No, kindly share your thoughts/suggestions re:. Realistic Streamlining Scheme. _____
_____.
32. Should the streamlining be pushed thru, what Early Retirement Scheme would you recommend? _____
_____
_____.
33. In case you/your position is transferred to the Region or Provincial Office as a result of the streamlining, what conditions/packages do you consider favorable/acceptable for both you and the NIA? _____
_____
_____.
_____ 34. Is your Employee's Association responsive to the needs of the members? Kindly suggest on how to strengthen the Association. _____
_____
_____.
_____ 35. Please give your suggestion/s on how to strengthen NIA Management systems.
_____