No.

Japan International Cooperation Agency(JICA)

National Irrigation Administration (NIA)
The Republic of the Philippines

THE STUDY

ON

THE IRRIGATORS ASSOCIATION STRENGTHENING PROJECT

IN

NATIONAL IRRIGATION SYSTEMS

MAIN REPORT

July 2003

Nippon Koei Co., Ltd.
Aero Asahi Corporation

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PREFACE

In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct the Study on the Irrigators Association Strengthening Project in National Irrigation Systems and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA dispatched a study team headed by Mr. Yutaka Murai of Nippon Koei Co., Ltd. to the Republic of the Philippines between March 2002 and July 2003.

The team held discussions with the officials concerned in the Government of the Philippines, and conducted field surveys in the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relationship between our two countries.

Finally, I wish to express my sincere appreciation to the officials of the Government and those concerned in the Republic of the Philippines for the close cooperation they have extended to the study.

July, 2003

川上隆朗

Takao Kawakami
President
Japan International Cooperation Agency

Mr. Takao Kawakami
The President of
Japan International Cooperation Agency
Tokyo, Japan

LETTER OF TRANSMITTAL

Dear Sir,

With much pleasure we submit herewith the report for "The Study on the Irrigators Association Strengthening Project in National Irrigation Systems" in the Republic of the Philippines.

The study was carried out by Nippon Koei Co., Ltd in association with Aero Asahi Corporation under contract with JICA. The contract period was 17 months from March 2002 to July 2003. The purpose of the Study was to formulate an action plan for strengthening irrigators associations (IAs) of the national irrigation systems (NISs) in the Republic of the Philippines. The study team conducted detailed field surveys and studies of 17 pilot IAs in six NISs selected from all 196 NISs with a service area of about 680,000 ha in total, and about 2,000 IAs. The study team adopted the project cycle management (PCM) participatory approach for conducting field surveys and studies to bring out the potential capacity of IA members and local staff of the National Irrigation Administration (NIA) and relevant local government agencies. The study team identified three issues upon which to frame the action plan, namely 'IA organizational strengthening', 'IA operation and maintenance strengthening' and 'IA financial performance'. Specific action plans were formulated by each of the 17 individual pilot IAs based on these three issues. The Team then integrated those individual plans into an overall action plan. The study report recommends the way for the implementation of the overall action plan that the plan will be implemented as a pilot project targeting the same 17 pilot IAs at first. Then the lessons learned from the pilot projects be reflected in the nationwide IA strengthening project.

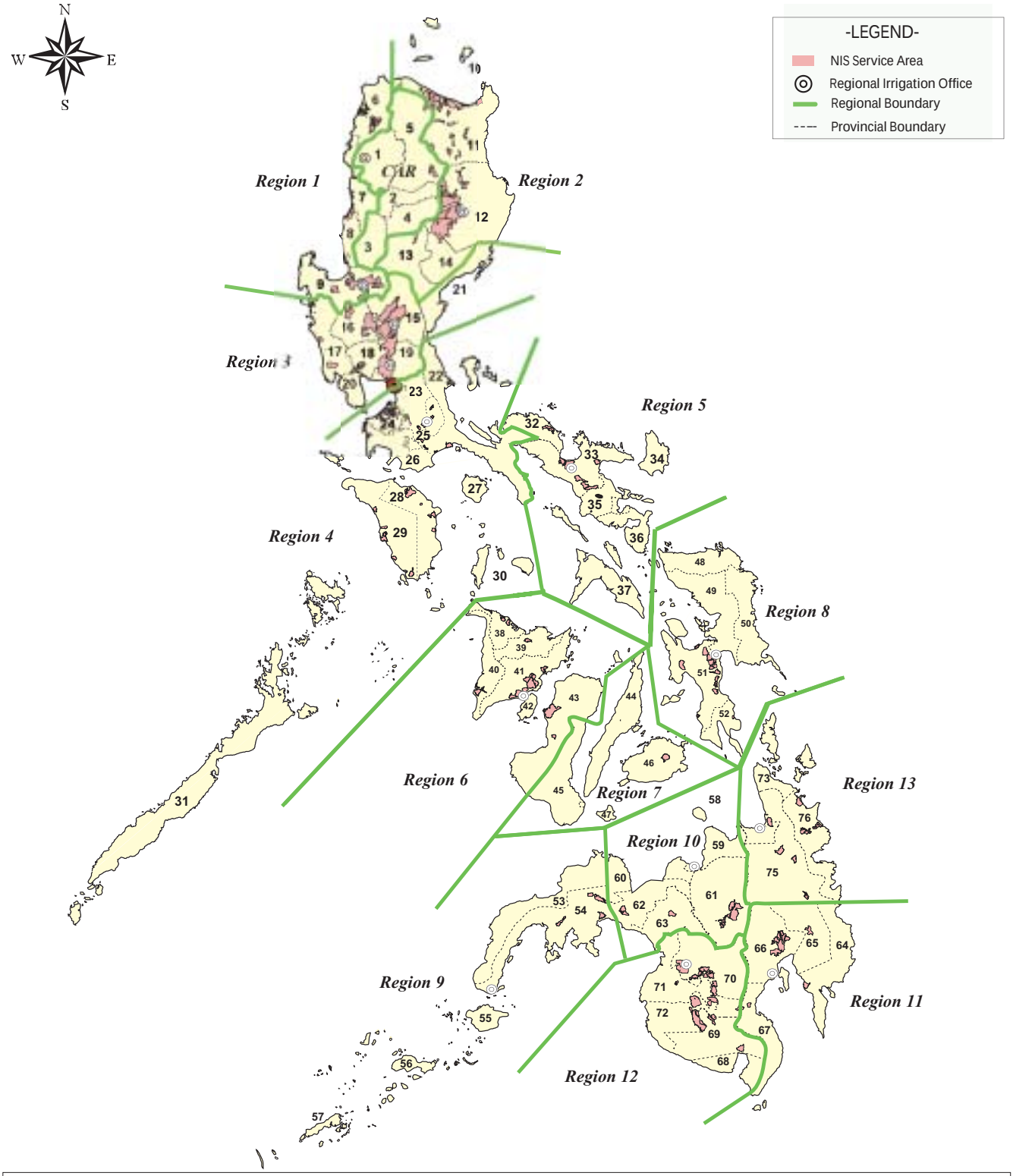
We hope this report will help to assist the achievement of sustainable irrigation development, accelerate the reforms of the Philippine Government's 'Agriculture and Fisheries Modernization Act' (AFMA), and we also help this report will contribute to fostering cordial relations and good-will between the nations of Japan and the Philippines.

Finally, we wish to express our deep appreciation and gratitude to the personnel concerned from your Agency. We also appreciate the personnel concerned from your office in the Republic of the Philippines, the Embassy of Japan in the Republic of Philippines, and NIA for the courtesies and cooperation extended to us during our field surveys and studies.

Yours sincerely,

村井 裕

Yutaka Murai
Team Leader
The Study on the Irrigators
Association Strengthening Project in
National Irrigation Systems



CAR (Cordillera Administrative Region)
1. Abra
2. Mountain Province
3. Benguet
4. Ifugao
5. Kalinga Apayao

REGION 1 - Ilocos
6. Ilocos Norte
7. Ilocos Sur
8. La Union
9. Pangasinan

REGION 2 - Cagayan Valley
10. Batanes
11. Cagayan
12. Isabela
13. Nueva Viscaya
14. Quirino

REGION 3 - Central Luzon
15. Nueva Ecija
16. Tarlac
17. Zambales
18. Pampanga
19. Bulacan
20. Bataan 21. Aurora

REGION 4 - Southern Tagalog
22. Quezon
23. Rizal
24. Cavite
25. Laguna
26. Batangas
27. Marinduque
28. Mindoro Oriental
29. Mindoro Occidental
30. Romblon
31. Palawan

REGION 5 - Bicol
32. Camarines Norte
33. Camarines Sur
34. Catanduanes
35. Albay
36. Sorsogon
37. Masbate

REGION 6 - Western Visayas
38. Aklan
39. Capiz
40. Antique
41. Iloilo
42. Guimaras
43. Negros Occidental

REGION 7 -Cental Visayas
44. Cebu
45. Negros Oriental
46. Bohol
47. Siquijor

REGION 8 - Eastern Visayas
48. Northern Samar
49. Western Samar
50. Eastern Samar
51. Northern Leyte
52. Southern Leyte

REGION 9 - Western Mindanao
53. Zamboanga del Norte
54. Zamboanga del Sur
55. Basilan
56. Sulu
57. Tawi-Tawi

REGION 10 - Northern Mindanao
58. Camiguin
59. Misamis Oriental
60. Misamis Occidental
61. Bukidnon 62. Lanao del Norte
63. Lanao del Sur

REGION 11 - Southern Mindanao
64. Davao Oriental
65. Compostera Valley
66. Davao del Norte
67. Davao del Sur

REGION 12 - Central Mindanao
68. Sarangani
69. South Cotabato
70. North Cotabato
71. Maguindanao
72. Sultan Kudarat

REGION 13 - Caraga
73. Surigao del Norte
74. Agusan del Norte
75. Agusan del Sur76. Surigao del Sur

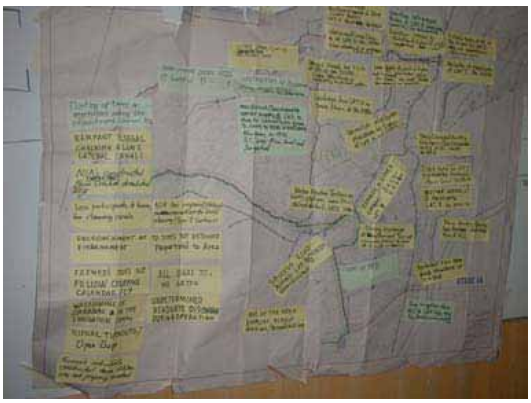
Map of the Republic of the Philippines

Participatory Rural Appraisal Survey in the Pilot IAs

Walk Through Inspection

Interview with Farmers Before Inspection

Walk Through Inspection



Result of Walk Through (Facility Status)

PCM Workshop

Problem & Objective Analysis by Farmers

Result of Analysis (Tree)

Presentation of Action Plans by Farmers

Action Workshop

Preparation of IA Policy

Approval in IA General Assembly

Distribution of Maintenance Tools

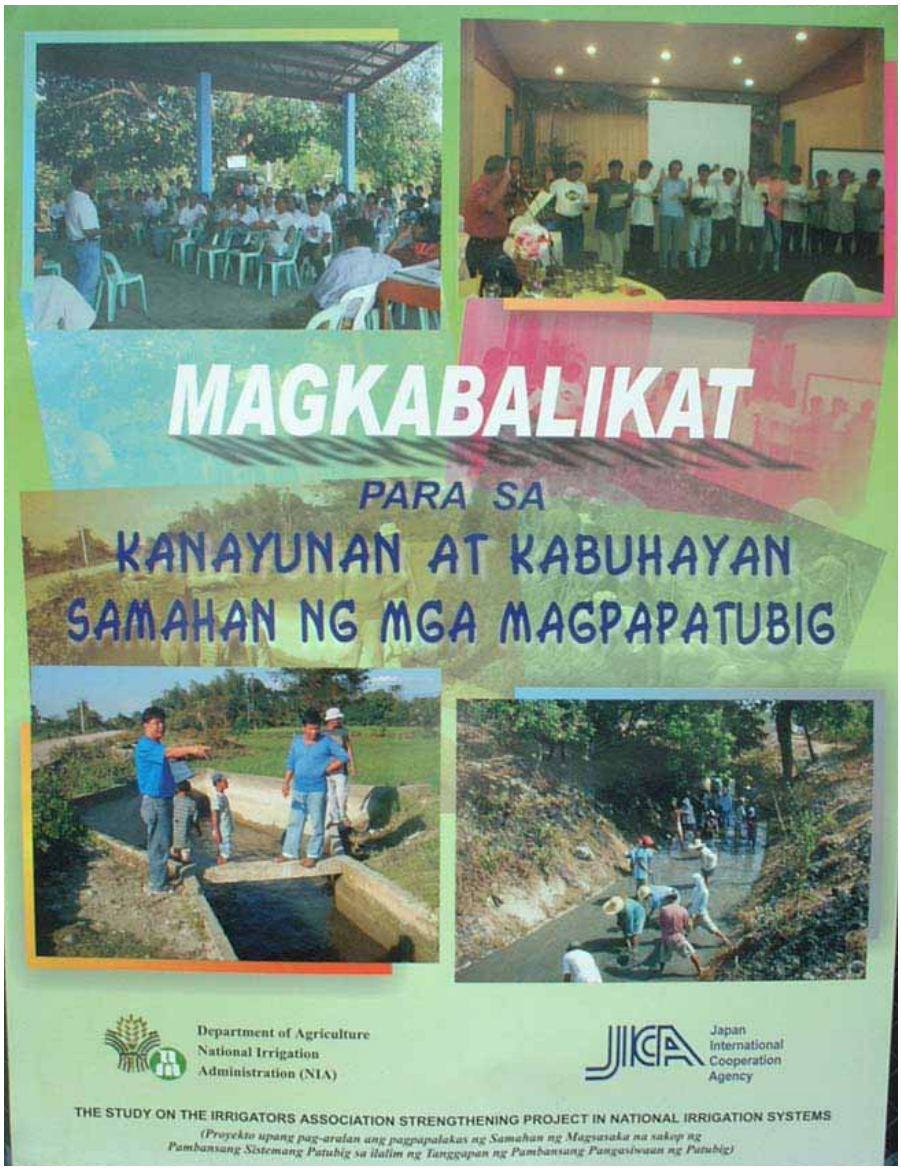
Maintenance Activities

Post Study Seminar

Opening by Deputy Administrator

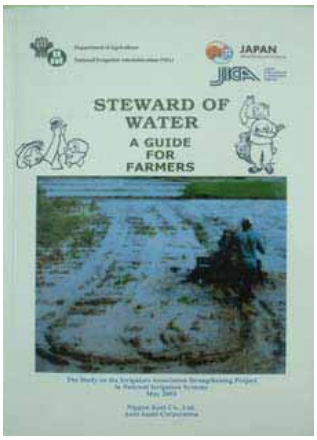
Seminar Presentation

Campaign Poster

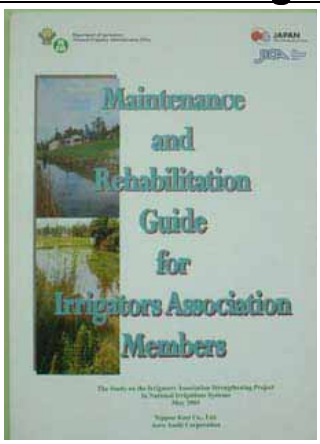


(Work Together for Community and Life)

Manuals for IA Strengthening



Steward of Water
A Guide for Farmers



Maintenance and Rehabilitation
Guide for IA Members

IA Strengthening Module
for Trainers Use

SUMMARY

1. Introduction

1.1 The Study on the Irrigators Association Strengthening Project in National Irrigation Systems (the Study) was carried out in accordance with the Implementing Arrangement (I/A) on the technical cooperation and the Minutes of Meeting agreed dated October 1, 2001 between the Republic of the Philippines represented by the National Irrigation Administration (NIA) and the Japan International Cooperation Agency (JICA). The objectives of the study are: (1) to formulate an Action Plan for strengthening Irrigators Associations (IAs) in National Irrigation Systems (NISs) aiming at efficient management of irrigation systems and achieving the objectives of IMT and (2) to transfer technology to counterpart personnel and IA members on planning procedures and methodologies relating to relevant fields of expertise.*(1.1.1)*

1.2 This report presents the process and results of the Study comprising Phases 1 and 2. The main activities of Phase 1 were to select six NISs associated with 17 IAs from 196 NISs and about 2,000 IAs, to set a framework of an Action Plan for strengthening NIS-IAs, and to incorporate the IAs' database into the existing GIS. In Phase 2, the Study Team conducted participatory based field surveys and studies in the 17 pilot IAs and assisted the pilot IAs in formulating their specific action plans. These specific action plans were finally integrated in a nationwide Action Plan for NIS-IAs strengthening. The GIS database system and manuals and campaign tools for IA strengthening were produced. At the end of Phase 2, the Study Team conducted a series of workshops and seminars, including two action workshops in the two NISs of San Fabian and Bago, GIS operation training and a post-study seminar.

2. POLICY FRAMEWORK ON NIS-IA STRENGTHENING

NIA's Streamlining Plan

2.1 The NIA released the latest version of its streamlining plan in January 2002, borne out of the recommendations of the JICA-assisted Study on the Strengthening of the NIA's Management System completed in October 2001. The DBM has completed its evaluation and recommendation and is waiting for an Executive Order to be issued by the President of the Philippines, subject to Congressional deliberation and approval. NEDA is closely monitoring the reorganization as this will have an impact on the processing of future NIA projects.

Irrigation Management Transfer (IMT)

2.2 The present IMT covers the transfer of only the management of the system's secondary facilities and does not allow the transfer of the assets to the IAs. The NIA compensates the IAs for services rendered in canal clearing and collection of the ISF. The rates are fixed for Type I and II contracts. In the case of the existing IMT/JSM contracts, however, the sharing of collected ISF between the NIA and IA is variable. It is normally decided bilaterally between the NISO and IA. The sharing may range from 50%-50%, 40%-60%, to 30%-70%. The IAs are obliged to do minor canal repairs using their share from ISFs, unlike in Type I contracts where the IA is paid by the NIA for canal clearing.

2.3 Foreign-funded projects, notably by the WB and ADB, are being implemented to accelerate IMT. The ADB-assisted SPISP promotes the rehabilitation of NISs with service areas of 3,000 ha and below, including the transfer of the facilities to the IAs. This practice is equivalent to CIS, where IAs are made to amortize the cost of rehabilitation. The government encourages cost recovery in small to medium-sized irrigation projects and allows the IAs to participate actively in the O&M of the systems. Institutional efforts are being exerted by these donor institutions to strengthen the capacities of IAs in sustaining O&M of system facilities.

3. IRRIGATION WATER ECONOMY AND LEGAL FRAMEWORK OF IA

Present Status and Issues on Cost Recovery and ISF

3.1 In 1974, the NIA established ISF rates to align with the type of irrigation scheme and crop planted so that corresponding O&M cost increases could be integrated. This scheme has been the policy for almost 30 years. The exception was in 1998 through the implementation of the so-called socialized ISF rate under AO 17. The scheme, however, led to rampant non-payment of ISF among water users which has badly deteriorated the NIA's cash flow. In 2001 the 1975 ISF rates were again re-imposed following the provisions of EO197 and EO218 allowing government corporations to raise their current fees to improve their revenues.

ADB's Study on ISF Alternative

3.2 The ADB study on the "Review of Cost Recovery Mechanism for National Irrigation Systems" completed in 2000 cited the following major recommendations: i) the full O&M recovery cost at NIS level is estimated at Php2,300/ha, ii) the appropriate annual ISF rate is 6.5 cavans/ha for diversion systems and 7.5 cavans/ha for reservoir systems, or Php3,325/ha and iii) the spread of Php1,025/ha should be used as a seed fund. The Study Team verified these proposals and concluded that the

proposed ISF rate of Php3,325 is ideal to recover the full cost of O&M given the huge increase in prices to date.

Legal Framework

3.3 By virtue of Republic Act (RA) 3601 and Presidential Decree (PD) 552, the NIA issued several MCs to direct the organization of the IA's. More recent laws such as RA 7607 and RA 8435 (AFMA) also emphasize the development and strengthening of the IAs to support the NIA's turnover of systems management. A review of sample IA by-laws reveals many provisions that limit not only their membership but also their effective and efficient operation. To make the IAs viable organizations and ensure the optimal use and sustainability of the irrigation systems, there is a need to review their policies and procedures and provide the necessary institutional development support.

3.4 The NIA adopted the IMT approach in the mid-1990s to strengthen its partnership with the IAs. The current IMT policy being adopted by the NIA, however, does not include transfer of ownership of system assets to the IAs. The issue of turning systems over to the IAs should consider not only the legal framework but also the capacity of IAs to assume responsibilities related to system management. The NIA may not be constrained from transferring system ownership to IAs if they had the capacity to assume full management responsibility for the systems.

4. IRRIGATORS ASSOCIATIONS IN NATIONAL IRRIGATION SYSTEMS

Overview of NISs

4.1 There are 196 NISs nationwide with total service area of 689,000 ha and 65% of the service area is concentrated in Luzon. In principle an NIS is defined as an irrigation system covering more than 1,000 ha. There are 65 NISs with a service area of less than 1,000 ha totalling 38,200 ha or corresponding to 5.6% of all the NISs. The NIA through its MC No.14 in 1989 promoted the takeover by IAs of such small NISs under Type III contracts. However, only four (4) contracts have been concluded since 1987.

4.2 The facility survey of system facilities conducted by the NIA in 2001 revealed that: (i) more than 60% of the length of main and lateral canals needed rehabilitation works mainly in desilting, reshaping and embankment heightening; and (ii) more than 50% of control structures provided on main and lateral canals are also in need of restoration and improvement, although most are not in a critical condition for system operation. The limited funds for O&M, basically provided by ISFs collected

from irrigation beneficiaries, resulted in poor maintenance and inadequate service. This has discouraged the beneficiaries from paying their ISF.

4.3 In 1997, the annual cropping intensity ranged from 130% in Luzon to 160% in Mindanao. The 1998 cropping intensity, however, drastically dropped, except in Mindanao, due mainly to El Nino. Cropping intensity in Mindanao was more than 150%, slightly higher than Luzon and Visayas, at about 130% and 140% respectively, due to stable weather and abundant rainfall.

4.4 The ISF collection efficiency in 1997 was 48.3%. The Socialized ISF implemented in September 1988 badly affected ISF collection. ISF collectibles were reduced by 30% from the previous ISF rate. As a result, collected ISF amount and collection efficiency in 1998 declined from the previous year. Allowing all government agencies to upgrade fees and charges in 2000 rehabilitated the ISF to the previous rate effectively beginning in July 2001. The effect of this revision, however, has not improved the collection performance.

Profile of IAs

4.5 Less than 1% of total IAs have membership of 60% of the potential members and above, reflecting the voluntary nature of membership participation. A typical member has an average farm size varying from 1.1 to 1.5 ha, while larger farmlands, above 2.6 ha, are held by 7% of members. Owner cultivators and certificated land transferees account for 56% of total members while tenants represent about 25%. Incidence of tenancy in IAs is thus high by normal standards. The average yield of paddy rice is relatively low. Only 7% of total IAs registered have a yield of above 100 cavans/ha during the dry season and only 1% during the wet season. The modal yield ranges from 70 to 90 cavans/ha.

4.6 ISF collection efficiency among IAs is generally low. More than 30% have collection efficiency below 50% and only 11% have attained 81% to 100%. More than 40% of total IAs had net worth of less than Php 20,000 in 2001, and only 4% have posted Php 100,000 and above. Almost 50% of IAs have both Type I and II contracts. IAs with only Type I contracts account for 13% while Type II contracts represent about 10%. Hydrological locations affect the intensity of implementing various O&M plans. Functional to moderately functional IAs in upstream areas generally implement cropping calendar, water delivery and distribution, repair and maintenance and ISF collection plans. Only 20-30% of total IAs, however, carry out these tasks. Non-functional IAs never bother to implement these plans.

Institutional Development of IAs

4.7 The NIA's participatory-based training packages suffer from: (a) limited innovative subjects; (b) limited upstream activities on water saving measures; (c) limited information on marketing and entrepreneurial activities; and (d) too much reliance on the NIA's IDOs instead of well trained IA leaders. The donors' assistance mitigates the above deficiency somehow. JICA introduced an in-country training method in early 2001. This method was a mixture of classroom discussion and cross visits to well-managed irrigation systems, research institutions and successful local IAs. The cross visit component is relevant as it opened the door of opportunities for IAs to learn from actual interaction with practitioners of successfully managed institutions.

IA Activities' Assessment from an Interview Survey of 200 IAs

4.8 The Study made a survey of 200 IAs, on an interview basis, to assess the O&M and other activities of IAs. The sample size of 200 was pre-determined, but selection was stratified according to (a) hydrological locations and (b) functionality of IAs based on the NIA's criteria. The results of the survey of 200 IAs are summarized in the following table.

IA Activities' Assessment

(1) Preparation of O&M Plan				
Description	IA Category	Implementing Rate	Highest	Lowest
1.1 Cropping calendar	Functional IA	14 - 44%	U/S	M/S
	Mod. functional IA Non-functional IA	15 - 30%	D/S	M/S
1.2 Water delivery and distribution	Functional IA	14 - 46%	U/S	M/S
	Mod. functional IA Non-functional IA	15 - 30%	U/S	M/S
1.3 Repair and maintenance	Functional IA	4 - 32%	U/S	M/S
	Mod. functional IA Non-functional IA	4 - 33%	D/S	U/S
1.4 ISF collection	Functional IA	11 - 35%	U/S	M/S
	Mod. functional IA Non-functional IA	7 - 29%	U/S	M/S
(2) Implementation of O&M Plan				
Description	IA Category	Implementing Rate	Highest	Lowest
2.1 Cropping calendar schedule	Functional IA	17 - 45%	U/S	M/S
	Mod. functional IA Non-functional IA	6 - 23%	M/S	D/S
2.2 Water delivery and distribution schedule	Functional IA	11 - 34%	U/S	D/S
	Mod. functional IA Non-functional IA	13 - 29%	D/S	U/S
2.3 Repair and maintenance schedule	Functional IA	8 - 25%	U/S	M/S
	Mod. functional IA Non-functional IA	9 - 20%	U/S	M/S
2.4 ISF collection	Functional IA	11 - 35%	U/S	M/S
	Mod. functional IA Non-functional IA	10 - 22%	U/S (both)	

Note U/S : Upstream area, M/D : Midstream area, D/S : Downstream area / Source : Study Team

(table continued)

(3) Conduct and Attendance in Meeting				
3.1 TSA meeting	Functional IA	Conduct 60% - rare Attend 80% - rare	U/S	M-D/S
	Mod. functional IA	Conduct 20 -45% Attend 75%	U/S	D/S
	Non-functional IA	Conduct 18 - 55% Attend 30 - 84%	D/S	M/S
3.2 BOD meeting	Functional IA	Conduct 16 - 90% Attend 80 - 90%	U/S	M-D/S
	Mod. functional IA	Conduct 20 - 40% Attend 90%	U/S	D/S
	Non-functional IA	Conduct 40 - 52% Attend 80 - 90%	D/S	M/S
3.3 General Assembly (GA) meeting	Functional IA Mod. functional IA	Conduct 70 - 75% Attend 65 - 90%	U/S	M-D/S
	Non-functional IA	Conduct 50% Attend 80%	U/S	M-D/S

Note U/S : Upstream area, M/D : Midstream area, D/S : Downstream area / Source : Study Team

The above table clarifies that IAs located in the upstream of the irrigation system are generally more active, while it denies a prejudice that those downstream must be the poorest.

Systemic Issues on IAs

4.9 The systemic issues on IAs identified in relation to the promotion of IMT and devolution of NIA's major function to IAs include defective membership structure; weak absorptive capacity; defective by-laws; conflict of interest in the NIA's IMT; inadequacy of training; and low financial resources. The resolution of these issues is crucial in strengthening the IAs.

5. IMT AND JOINT SYSTEM MANAGEMENT

Current Status and Performance of NISs under IMT and JSM

5.1 There are 44 NISs (17 IOSP II and 18 WRDP assisted by WB and 9 ISIP II by ADB) where IMT/JSM is intensively pursued. The IOSP II was completed in 2000, while the two latter projects are due to be finished in 2004. The performance of IMT in terms of ISF collection efficiency between the periods 1996 and 2000 has been generally mixed. With the exception of 11 NISs whose ISF records are incomplete, the performance of 8 NISs has been increasing while in 21 NISs it has been declining.

Findings in Four (4) IMT - IAs

5.2 The Study Team attempted to identify the impact and issues affecting the implementation of IMT through the site reconnaissance of four NISs: Balanac RIS, Sta. Maria RIS and Agos RIS in Region IV representing a group of smaller to medium scale of NIS, and MRIIS in Region II comprising a large scale irrigation

system. The findings may be summarized as follows: (a) agricultural production increased owing to improved water supply; (b) irrigation water can be delivered flexibly; (c) awareness among members has been enhanced; (d) officers and leaders were encouraged to participate owing to regular payment of incentive. The positive factors that may have brought favorable performance are: concrete lining of canals, intensive training and strong leadership believed to be an indigenous human relationship between big landowners and members

5.3 While signs of improved performance were noted, the impact of IMT is still inconclusive. The following observations may be advanced: (a) the perceived impact of IMT on MRIIS appears to be restrained due to conflict in objectives between reduced ISF income and inability to retrench redundant personnel; (b) the ISF collection efficiency in MRIIS has generally not increased, except for some CIAs; (c) there is no direct influence of IMT insofar as improvement in income and livelihood is concerned; (d) the socio-economic conditions of farmers remained unchanged; and (e) the incentive collected from the ISF is generally insignificant with respect to the cost of O&M.

Issues in IMT Contract Document

5.4 Several issues, crucial for sustainability of IAs under IMT, were identified in the IMT contract documents. These are: (a) lack of legal framework; (b) inadequate penalty and sanctions; (c) ambiguous responsibility sharing; (d) inappropriate ISF sharing scheme; (e) responsibility of renewing facilities. These issues necessitate the crafting of an "Irrigators Association Law" and formulation of a comprehensive IMT policy.

Volumetric ISF Pricing and Pilot-testing of Volumetric ISF in MRIIS

5.5 In 1966 the NIA launched a longer-term objective to move from the area-based billing to the volumetric pricing at the head of lateral canals, supported by the WB-assisted WRDP. With the successful pilot-testing of volumetric ISF billing and collection in the pilot area in MRIIS, the NIA encouraged, through the issuance of MC 64 in October 2002, the adoption of volumetric ISF pricing to all other irrigation systems with completed rehabilitation works and with existing IMT contracts. Volumetric ISF pricing has certain advantages such as: a) improved water use efficiency through farmers saving, resulting in expansion of irrigation service area; b) saving in the NIA's cost of handling the ISF collected in kind; and c) secure accountability of ISF transactions. On the other hand, some constraints have to be overcome to accelerate its implementation. The most crucial issue is to find an accurate and reliable measuring device. The next issue is the requirement of a

considerable fund for repair and rehabilitation of system facilities. In addition, the NIA has to establish a uniform volumetric pricing formula acceptable to both the NIA and farmers.

System Rectification for IMT

5.6 System rectification is the foremost pre-condition for IAs to enter into an IMT contract, particularly in meeting the demand to provide irrigation canals with full concrete lining. This is a crucial issue for the NIA which is being faced with a serious financial problem. Three factors that should be considered in system rectification include:

(1) System Responsibility Demarcation

Defined as the sharing of responsibility between the NIA and IA, considering technical and institutional limitations, the recommended system demarcations are:

- The NIA is responsible for operation and maintenance of the head structure (diversion dam, reservoir dam, pump station);
- The NIA is responsible for operation and maintenance of canals down to the point of a lateral headgate, the total service area of which is not more than 2000 ha; and
- The CIA and IA are responsible for operation and maintenance of the designated lateral in accordance with the IMT contract.

(2) System Rectification Process

All activities involved in the system rectification will be performed on a participatory basis to guide both parties to a satisfactory and reasonable agreement for IMT contracts. The process piloted in the implementation of IOSP II, supported by practical approaches obtained from the Study is recommended.

(3) Rehabilitation and Repair Works

Two categories of rehabilitation are necessary, lateral and main systems' rectification. Lateral system rectification will be limited to the essential work, sufficient for the IA to perform proper O&M. Main system rectification will focus on the repair and rehabilitation of main system facilities and include removal of deposited silt in canals, functional recovery and/or improvement of headwork, placement of control and safety structures, placement of measurement devices, and provision of roads for canal O&M. The provision of concrete lining for both lateral and main system rectification will be considered only in cases where full or partial concrete lining will protect canal facilities from heavy water leakage or serious soil erosion. The only

other justification for concrete lining is where it will provide remarkable improvement of the entire system efficiency resulting in expansion of service area, subject to technical and economic viability.

Legal Arrangement

5.7 Unlike provisions for cooperatives under the Cooperative Code and agrarian reform under the Comprehensive Agrarian Reform Law, there is no clear legal framework for IA organization and operation. There are several options to pursue this issue. In the immediate term, the NIA can execute MCs on: (a) mandatory membership (b) enhancement of internal policies, systems and procedures including by-laws; and (c) implementation of innovative schemes to consolidate IA activities to attain efficiency such as land trust arrangements and establishment of assembly markets for members' produce. Similarly, an explicit IMT policy should be introduced to clarify and strengthen the role of IAs in IMT. Existing IMT contracts between the NIA and IAs will have to be revised in accordance with the enhanced provisions of this IMT policy.

5.8 In the medium to long term the IAs may opt to evolve into more entrepreneurial organizations. The passage of a special law on IAs, for instance, can give a stronger basis for the organization and operation of IAs. The proposed legislation will clearly define the social role of IAs in food production and guide their involvement in the management of NISs. Specifically, the proposed IA law should highlight: (a) the purpose of organizing IAs; (b) IA roles and responsibilities; (c) benefits and privileges; (d) guidelines and procedures in IA organization and operation; and (e) institutional development mechanisms. However, effective and efficient IA operation cannot be ensured without support mechanisms in place. Thus, a comprehensive law on irrigation development is seen as a more sustainable legislation in the long run.

6. ASSESSMENT OF NIS AND IA

NIS-IA Classification

6.1 Statistical analysis shows that all the NISs can be characterized by six (6) indices: (i) level of NIS facilities, (ii) agricultural performance; (iii) farmers livelihood; (iv) sufficiency of water resources available; (v) market accessibility; and (vi) NIS O&M performance. The cluster analysis of these six (6) indices yielded five (5) Groups, with corresponding characteristics as shown in the next page:

Characteristics of Grouped NISs assessed by Statistical Analysis

NIS Group	Characteristics of NIS Assessed
1	Water Constraint Type NIS
2	Potential un-exploited Type NIS
3	Market-away Type NIS
4	Small Scale and Pump Type NIS
5	Urbanization affected Type NIS

6.2 The majority of the NISs are classified in Group 2 including the entire districts of UPRIIS and MRIIS. Group 2 NISs are generally unsatisfactory at all levels. However, this group has potential for enhancement of system performance by re-activation. Group 3 ranked second in terms of service area and number. The performance of NISs and IAs under Group 3 is relatively better than Group 2. The disadvantage of this Group is that most NISs are away from large markets. Group 1 ranked third in terms of service area and number and the majority lack water resources. However, system facilities are relatively well provided and maintained. NISs under Groups 4 and 5 having a rather unique nature of irrigation system are not nationwide models and hence were excluded from the selection of target NISs for the detailed survey and study in Phase 2.

IA Classification

6.3 A total of 1,665 out of 2,054 IAs were classified based on the results of the IA functionality survey and results of an inventory survey made by the JICA Study Team. The statistical analysis yielded four components that can best explain the characteristics of IAs, among which are: (i) poverty level, (ii) farming scale, (iii) degree of IMT development, and (iv) location relative to water source/intake. The cluster analysis showed that almost all the IAs could be statistically grouped into three groups. Interpreting the scale and combination of four components, the characteristics of the respective three groups of IAs are shown below.

Characteristics Assessment of IA Groups

Characteristic	IA Group		
	A	B	C
Farmers livelihood	Relatively higher	Relatively lower	Low
IA performance	Relatively higher	Relatively lower	Low
IA location	Upstream	Mid stream	Downstream

Note U/S : Upstream area, M/D : Midstream area, D/S : Downstream area / Source : Study Team

Selection of Target NIS-IA

6.4 The number of target NIS-IA groups was set at six. The basic concepts adopted in the selection of target NIS-IA groups were: (a) the target NISs represent the majority of NISs; (b) all IAs or selected IAs in a target NIS represent the majority of IAs; and (c) the selected NIS-IA has high potential for improvement in terms of

IMT implementation and enhancement of farmer's livelihood through strengthening of the NIS-IA system and institutional management. The six target NISs are shown below:

Selected Target NIS-IAs

Geographical Area	Region	NIS Name	NIS Group	Service Area (ha)	Nos. of IA	Aver. IA Area (ha)	Aver. IA Members
Luzon	1	San Fabian	Group 1	2,288	7	327	262
	3	Angat	Group 2	29,374	89	330	190
Visayas	6	Bago	Group 2	12,700	17	747	243
Mindanao	9	Lagangan	Group 2	3,195	2	1,597	769
	10	Pulangui	Group 2	11,415	17	671	394
	11	Mal	Group 3	2,613	15	522	107

Source : Study Team

6.5 Three target IAs were selected from each target NIS based on the following process and criteria: (a) the IA is located in a lateral canal due for lateral transfer under IMT; (b) the IA represents a distinct hydrological location; (c) the IA has enough members, not less than 100, and land tenure status of members is evenly distributed. A total of 17 IAs were selected as shown below:

Selected Target IAs

IA Name	Location	Service Area (ha)	Farm H. Hold
(1) Name of NIS : San Fabian (R-1) / Name of Lateral : MC-J			
Scientific Farming	Upstream	827	730
BGM	Mid-stream	361	377
San Juan Babasit	Downstream	245	455
(2) Name of NIS : Angat (R-3) / Name of Lateral : Lateral D			
Picaba	Upstream	494	754
Balucoc	Mid-stream	488	851
Josephian	Downstream	398	420
(3) Name of NIS : Bago (R-6) / Name of Lateral : Lateral E			
Atidu	Upstream	908	262
Amana	Mid-stream	942	580
Bunasabala	Downstream	1,099	597
(4) Name of NIS : Labangan (R-9) / Name of Lateral : MC and Lateral A			
Munchrist	Upstream	1,377	592
Sandata	Downstream	1,383	817
(5) Name of NIS : Pulangui (R-10) / Name of Lateral : Lateral G			
Paradise G5 & G6	Upstream	809	505
Kahugpungan	Mid-stream	1,025	420
Mad	Downstream	1,256	647
(6) Name of NIS : Mal (R-11) / Name of Lateral : MC Right			
Weslasufia	Upstream	130	153
Labakafia	Mid-stream	279	215
Malkaira	Downstream	121	104

Source : Study Team

7. PARTICIPATORY RURAL APPRAISAL (PRA) SURVEY

Present Condition of Selected NISs and NISOs

7.1 All of the six irrigation systems are diversion dam type with a gravity irrigation system. Rehabilitation of the systems has been rare, resulting in the need for canal

desilting works, and the malfunctioning or non-existence of more than half of the turnout gates. Of the six NISs, Mal is in the best condition, mainly because of the recent concrete lining of the canal and regular maintenance from member IAs. The worst is San Fabian where less than 20% of the facilities are functional.

7.2 There is unequal distribution of NIA staff among the NISOs. The average workload, represented by the service area covered by a single O&M staff member, varies from 250 ha to 650 ha. For institutional staff the workload varies from 2,600 ha to 11,400 ha. The NISO's budget allocation is always above the expenditure level, but in reality they can spend only up to their income level. The income is derived mainly from ISF collection and rental earnings from equipment. More than 50% of the expenditure is in salaries for personnel. Expenses under maintenance and other operating expenses (MOOE) consist mainly of travel, employee benefits, sundries, etc. Consequently the direct expenses for maintenance of irrigation facilities are minimal. For instance, Angat, the biggest system, spends a measly 1% of total MOOE reflecting virtually no funds available for maintenance of the irrigation facilities.

Socio-economic and Organizational Profiles of Pilot IAs

7.3 The mean landholding in 17 IAs is about 1.2 ha, ranging from 0.5 to 1.6 ha. The average yield of paddy rice is about 4.0 tons/ha for both the wet and dry seasons, while the cropping intensity is roughly 150% for all IAs. About 50% of total members are reported as owner-cultivators in all systems. However, this number is not reflective of the true situation. Owner-cultivators have actually delegated their cultivation rights to tenants, caretakers and/or hired farm managers, and register themselves as members in several IAs covering the land they own. Combining the tenants with the care-takers and transient owners, the proportion is about two-fifths of the total members. High incidence of tenancy is prevalent in Malkaira, Labakafia, Picaba and Sandata IAs, where tenancy ranges from 50% to 70%.

7.4 The predominant absentee-landowner land tenure structure affects the quality of participation in most IA activities. The tenants and caretakers seldom participate in IA activities like canal clearing and attendance at meetings. From an organizational standpoint, legitimizing caretakers and tenants as members of the IA is a further step in enhancing the base of the organization. A suggestion for dealing with the absentee landowners without necessarily diminishing their right and ownership status, is to introduce a land sharing arrangement (farmland trust) where they will entrust the custody of their land to the caretakers who have become members of the IAs.

7.5 The average rate of IA membership is barely 40% with a wide variation ranging from the lowest 20% in the old IAs to younger IAs at 80%. However, the master list of most pilot IAs has not been updated and the current practice by original members to delegate the cultivation of their farms to caretakers and tenants makes it difficult to distinguish genuine from pseudo members, as typically seen in San Fabian. The average service area per TSA is about 50 ha while the number of farmers is about 40. However, the reported sizes may no longer be the same, as there are plenty of illegal turnouts constructed by farmers to draw as much water as possible. This is one of the major hindrances in enforcing equitable water distribution and synchronous planting. The illegal sub-division of TSAs would need a manageable TSA scale that is both cost-effective and efficient to manage.

7.6 The functionality of 17 IAs has been rated from fair to poor with a few exceptions. Most IAs are dormant organizations characterized by poor governance. They have been unable to perform basic services required for their members. As for the IA leadership, the leaders are generally not good role models who can portray right behavior and this is caused mainly by the poor selection of leaders, often with politicians' involvement. Under these circumstances, it is common to note overstaying leaders whose interests have become parochial to the association. Various IA documents and records for administration, finance and water management are often missing and/or incomplete, primarily because of poor record keeping. The lack of good records has badly affected formulation and implementation of O&M plans and policies.

O&M Profiles of Selected IAs

7.7 Cropping calendars and water distribution plans are normally prepared. However, the execution of these plans is far from satisfactory. The upstream IAs draw more than the required volume with all sorts of illegal practices, thus competition for water becomes very keen among farmers within the same IA, particularly at the downstream IAs. The other issue is allowing non-members to use the water as long as they pay the ISF, and they have also been perceived as responsible for illegal practices. The System Management Committee (SMC) being formed in the individual NISs should have an important role for arbitrating conflict in water usage, but most are dormant. Besides, the preparation of water distribution and cropping calendar plans is essentially NISO-driven, which means that they are water supply based and hardly incorporate crop-water needs at all. Because of a communication gap between leaders and members the IA leaders are immersed in the plan preparation but members are not.

7.8 Most IAs are obliged to execute maintenance works under the Type I contract. When the NIA pays for services rendered to IAs on time, the IAs at least commit themselves to clean secondary canals. However, the NIA is often remiss in its obligation to pay on time. This has prompted IAs to abandon their responsibility in canal clearing and this results in dumping garbage, planting trees and wallowing water buffalo on canals and embankments, even allowing squatting on the embankments. The poor maintenance can be attributed to the lack of a sense ownership of the facilities and also to the problem of the significant proportion of non-members.

Financial Profiles of Selected IAs

7.9 The main source of revenue is remuneration from Type I and II contracts. Financial standing in Type I depends on the timely payment by the NIA. The Type II earnings are not favorable because of low ISF collection efficiency by IAs. The effective ISF collection efficiency for both the wet and dry seasons during 1999-2001 was barely 30-40%, with the only exception in two IAs in Mal and Labangan achieving above 50%. The dismal performance was enough to disqualify the IAs from participating, and worse, they cannot receive any commission because the ISF collection rate is below the threshold of 50%. Thus, the net incomes are negligible.

7.10 There is practically no activity involved in trading. Paddy rice is being sold directly to traders without the benefit of further processing, except for the IAs in Pulangui RIS, where 50% to 90% of production is sold as milled. The quality of paddy rice being sold cannot command the premium price because of high moisture content. Solar drying is done on multi-purpose pavements. During the wet season, however, solar drying is limited because of preponderance of rain. This puts pressure on the IAs to dispose of their produce immediately after harvest at a time that prices are unfavorable. This is the argument raised by IAs about the low income received from paddy rice production. Consequently, members postpone ISF payment.

System Profiles of Pilot IAs

7.11 The functionality of system facilities was measured by ratios (%) of: functional canals in length, and structures in quantity (number), obtained from the joint walk-through inspection in the Study. The system functionality ranged widely: canals evaluated in flow capacity from 30% to 60%, operable control gates from 0% to 80%, functional turnouts from 0% to 80%. The number of illegal turnout was also identified with a range of 7% to 480%, the latter observed in Angat. In general, San Fabian is the worst among the six NISs, as all of the earthen canals were clogged up with silt and most structures were deteriorated and non-functional. Angat and Mal

were observed to be in relatively good condition. However, the canals in Angat were used as a dumping ground for garbage and drainage for a sewerage system. Mal was well maintained except that it had insufficient canal capacity for the newly adopted rotational operation.

Framework for Action Plan

7.12 The NIA counterpart officers and JICA Study Team jointly prepared the framework action plan for IA strengthening based on the results of PCM workshops and studies undertaken. Three major areas of concern, namely; organization, O&M and financial performance were identified. For each concern, sub-projects were identified and nine sub-projects were considered a priority as follows:

(1) IA Organization
  1.1 Building Productive IAs (capacity and team building)
  1.2 Installing Management Competencies
  1.3 Providing Appropriate Assistance for IA's Organizational Strengthening
(2) IA O&M Activities
  2.1 Formulating Rational O&M Policy and Plans
  2.2 Implementing Effective O&M
  2.3 Providing Appropriate Assistance for IA O&M Activities
(3) IA Financial Performance
  3.1 NIA's Financial Management Strengthening
  3.2 Collection Enhancement of IA's Dues and ISF
  3.3 Assistance for IA's Capacity Building on Financial Management and other activities

Assessment of IA Action Plans

7.13 The Study Team guided the 17 IAs to prepare individual action plans covering five sub-projects under the three broad areas of concerns indicated below.

7.14 As regards Organization, the components of two sub-projects are summarized below.

Organization: Outputs Required by Selected IAs

Sub-project 1.1 Building Productive IAs		**Sub-project 1.2 Installing Management Competencies**	
Component/Output	NIS specifics	Component/Output	NIS specifics
1. Activation of members		1. Improvement of systems and procedures	
• Updated master list	excl. Mal	• Systematic record keeping and updated administrative records	
• Mandatory registration of water users/farmers		• Establishment of working/standing committee	excl. Mal
• Mandatory participation of farmers in all activities		• Reconfirmation of juridical status with SEC	
2. Improvement of leadership quality and functions		2. Setting-up networking system	
• Regular election of officers and TSAG leaders		• Formation of IA council(s)	San Fabian and
		• Establishment of linkages with NIA, LGUs, inter-IAs, etc	Labangan

(table continued)

• Regular meetings and establishment of functional committees		3. Training • Skilled/trained officers and leaders	
• Review of by-laws	excl. Mal	4. Infrastructure Support	
3. Reorganization • Re-delineation of service area based on hydrological feature	excl. Pulangui & Mal	• Establishment of a permanent office	Bago and Labangan

7.15 As regards O&M, the components of two sub-projects are summarized below.

O&M: Outputs Required by Selected IAs

Sub-project 2.1 Formulating Rational O&M Plan and Policy		**Sub-project 2.2 Implementing Effective O&M Plan and Policy**	
Component/Output	NIS specifics	Component/Output	NIS specifics
1. Improvement of skills in plan and policy formulation		1. Strict enforcement of O&M plan and policies	
• Written and practical O&M policies and regulation		• Effective and equitable water distribution schedule	
• Adoption of integrated cropping calendar	excl. Pulangui and Mal	• Preventive maintenance of irrigation canals and farm ditches	
• Adoption of water delivery and distribution schedule	excl. Mal	• Repair and rehabilitation of irrigation canals and roads	
2. Support mechanism to plan and policy execution		• Sanctions and penalties for O&M violations	
• Establishment of coordination among Inter-IAs	Bago, Labangan and Mal	• Shallow tube wells as supplementary source of irrigation water during dry season	San Fabian only
• Extensive application of Type I and II contracts		2. Rehabilitation of conflict and service committees	
• Mandatory/active participation of members in O&M		• Resolution of conflict between upstream and downstream IAs in water distribution	excl. Labangan
		• Activation of service committees and TSA groups for effective execution	excl. Mal

7.16 The components for the area of financial performance are summarized below.

Financial Performance: Outputs Required by Selected IAs

Sub-project 3.2 Collection Enhancement of IA's Dues and ISF	
Component/Output	NIS specifics
1. Improvement of collection systems and procedures	
• Formulation of sound policies and procedures on ISF collection and members' dues	
• Setting-up financial control – recording, budgeting and audit	
2. Improvement of Skills	
• Training of officers and leaders – bookkeeping, financial management, project preparation, etc.	
3. Establishment of market-related and other income activities	
• Fund raising project	
• Enhancement of CBU scheme	excl. Mal
• Extension/renewal of Type I and II contracts	Bago, Labangan and Mal
• Micro-lending (livelihood) assistance	
• Operation of assembly markets	Bago, Pulangui and Mal

Resources of Government Agencies and Agreement with IAs

7.17 The individual IAs' action plans were presented at the wrap-up workshop at each NIS in the presence of concerned government agencies, which have the potential resources to provide technical and financial support to the IAs. The workshop gave the opportunity for the concerned agencies to learn about their expected roles and a menu of possible assistance, among which are training, credit, marketing, para-legal and provision of a development fund for minor infrastructure.

8. ACTION PLAN FOR IA STRENGTHENING

8.1 The Action Plan is presented in a form of PDM, consisting of targets to be achieved, output and input requirements and finally the proposed program packages that support the implementation of the Action Plan. The implementation of the Action Plan is divided into two stages. The first to be implemented is for the six Pilot NIS - IAs and this is followed by the nationwide replication.

Action Plan for IA Organizational Strengthening

8.2 The targets to be achieved at the end of the project are:

(a) more than 75% of members are actively participating in meetings and O&M activities (Sub-project 1.1);
(b) 90% of IAs have strengthened administrative capacities capable of doing situation analysis, planning, implementation, monitoring and evaluation (Sub-project 1.2); and
(c) 90% of IAs have received appropriate technical assistance in organizational concerns (Sub-project 1.3).

In order to achieve the targets, the NIA and IAs are to implement action plans with the following outputs:

Outputs for IA Organizational Strengthening

NIA	• Registration and updating master list • Development of practical training schemes and organizational strategies • Formulation of a unified IMT policy • Activation of System Management Committee (SMC)
IA	• Activation of membership • Improvement of leadership quality and functions • Enhancement of Skills • Installation of systems and procedures • Establishment of essential coordination mechanism • Re-organization • Provision of infrastructure support

8.3 The input requirements for pilot implementation and nationwide replication are summarized as follows:

Inputs for IA Organizational Strengthening

NIA	**Inputs for Pilot NISs** • Budget for IDP activities • Original master list, parcellary map, and other records • Task force for IA organizational strengthening (central, region and field offices) • IDOs and Farmer Irrigators Organizer (FISs) • Consultation with IAs, RIOs, ISOs, other agencies • Study on organizational weaknesses , and present level of IA management skill • Study on IMT performance and IMT implementation guidelines • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • Nationwide replication program • Fund arrangement • Training program for NIA-IA • Monitoring and evaluation
IA	**Inputs for Pilot NISs** • Venues and technical preparatory works for meeting and training • Attendance of IA officers and leaders during meeting and training • Travel expenses for officers and leaders • Members' counterpart for food during meeting and training • Voluntary works of IA members • Fund for record and filing system, and establishment of an IA center • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • NIA-IA working teams at regional level • NIA-IA joint study and implementation for IA organizational strengthening • Monitoring and evaluation

8.4 To ensure the implementation of the action plan for IA organizational strengthening, six program packages are proposed: (a) updating of master list, (b) regular election of officers, (c) installation of systems and procedures, (d) farmland trust management, (e) training, and (f) legal amendment.

Action Plan for IA O&M Strengthening

8.5 The targets to be achieved at the end of the project are:

(a) more than 75% of members are effectively implementing O&M policies and plans (Sub-project 2.1);
(b) more than 90% of the IAs are distributing water equitably (Sub-project 2.2), and
(c) more than 90% of members have received appropriate assistance to sustain O&M activities (Sub-project 2.3).

In order to achieve the targets, the NIA and IAs are to implement action plans with the following outputs:

Outputs for IA O&M Strengthening

NIA	• Formulation of written and practical O&M policies • Establishment of Coordination System • Training • Strict enforcement of O&M policies and plans
IA	• Formulation of written, practical and rational O&M policies and plans • Establishment of coordination system • Training • Strict enforcement of O&M plans and policies

8.6 The input requirements for pilot implementation and nationwide replication are summarized as follows:

Inputs for IA O&M Strengthening

NIA	**Inputs for Pilot NISs** • Task force for IA's O&M strengthening • SMC and its meeting at NIS level • Budget for pilot activities including rehabilitation • Study on present level of O&M skills at NISO and IAs • NIA-IA joint study for preparing O&M policy and plans using; master list and parcellary map, layout map of irrigation, meteorological data, hydrological data, water requirement of crops • Study on rehabilitation plans and works jointly with NIA-IAs (hydrological data, map, engineering report, cost estimate) • Trainers training (Regional/provincial) and training packages (IA leaders and members) • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • Nationwide replication program • Fund arrangement • Training program for NIA-IA • Monitoring and evaluation
IA	**Inputs for Pilot NISs** • Active participation of IA members • Updated master list of potential leaders • Counterpart Resources (food, venue of training/workshop/meetings, etc) • Local materials for repair and maintenance • Voluntary labor for O&M • Small farm tools and equipment • Member training program by IA trainers • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • NIA-IA working teams at regional level • NIA-IA joint study and implementation for IA O&M strengthening • Monitoring and evaluation

8.7 To ensure the implementation of the action plan for IA O&M strengthening, six program packages are proposed: (a) re-activation of TSAG; (b) system rectification, (c) enactment of O&M policy, (d) operations improvement, (e) maintenance improvement, and (f) training.

Action Plan for IA Financial Strengthening

8.8 The targets to be achieved at the end of the project are:

(a) ISF collection efficiency of 75% to 100% and prompt payment of ISF share to IAs by the NIA (Sub-project 3.1);
(b) ISF collection efficiency of 75% to 100% and 100% collection of membership dues (Sub-project 3.2), and
(c) more than 90% of members have received appropriate assistance with financial concerns (Sub-project 3.3).

In order to achieve the targets, the NIA and IAs are to implement action plans with the following outputs:

Outputs for IA Financial Strengthening

NIA	• Improvement of ISF collection policies and procedures • Training
IA	• Improvement of internal ISF policies and procedures • Training • Systems and Procedures • Market-related and income projects

8.9 The input requirements for pilot implementation and nationwide replication are summarized as follows:

Inputs for IA Financial Strengthening

NIA	**Inputs for Pilot NISs** • Task force for ISF collection increase at the NIA • Task force for IA financial management strengthening with other agencies • Committee with IAs, DA, DA, DAR, DILG/LGUs, LRA on ISF collection • Budget for IDP activities for training and technical assistance • Skills training, hardware and software for computerized billing system • Market information network among IAs (NIS/CIS), traders, LGUs, etc. • Fund for IA's other service activities (livelihood, post-harvest facilities) • Post-harvest technician for IAs' marketing activities • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • Nationwide replication program • Fund arrangement • NIA-IA joint study and implementation for IA's financial strengthening • Training program for NIA-IA • Monitoring and evaluation
IA	**Inputs for Pilot NISs** • Working teams at concerned region and NISOs • NIA-IA joint study and implementation for ISF collection increase • IA task force per TSA for ISF and membership dues collection • Participation of wives of IA members in collection of members' dues. Attendance of IA officers and leaders during workshops and training program • Member training program by IA trainers • Local counterpart fund or donations for IA projects, training and O&M activities • Financial and technical assistance for IA livelihood projects from other line agencies • Members patronage to IA livelihood projects and business • Voluntary works of IA officers, leaders and members in the implementation of income generating projects • Monitoring and evaluation of pilot activities **Inputs for Nationwide Replication** • NIA-IA working teams at regional level • NIA-IA joint study and implementation for IA's financial strengthening • Monitoring and evaluation

8.10 To ensure the implementation of the action plan for IA financial strengthening, five program packages are proposed: (a) ISF billing and cost-effective collection, (b) seed fund, (c) CBU and livelihood activities, (d) assembling market, and (e) training.

Implementation Schedule and Arrangement for IA Strengthening Action Plan

8.11 The implementation schedule for the IA strengthening action plan is divided into two stages. The first stage is the pilot implementation covering the periods 2002 to

2005 and will include all activities envisaged for the six pilot NISs. The pilot implementation will provide a good learning process for the NIA staff to implement the second stage, the nationwide replication. The nationwide replication covering the periods 2006 to 2015 is targeted to cover 140 NISs involving about 445,000 ha and 1,320 IAs.

9. GIS SYSTEM DESIGN AND DEVELOPMENT

GIS Application System Design

9.1 A GIS database designed in the previous JICA-funded study in 2001 was reconfigured to include two batches of data named "IA Inventory Matrix" and "Facilities Status Survey". The new functions added to the existing GIS system are "Display" and "Query data relating to IA boundaries", and two new attribute tables for IA Inventory Matrix and Facilities Status Survey. To fully utilize the reconfigured GIS database, the NIA will assign a permanent database manager in each of the four departments and conduct essential training. The database manager will file and manage the different reports and maps that the respective departments produce on a regular basis, and shift from manual record keeping to computer-based systems. Training for the computer system will familiarize the users and enable them to learn the system even for very simple tasks. In addition, an alternative Arcview related software will be provided because of the limited function of the Arcexplorer viewer, and a system linking the Access software to the GIS database and Excel files will be worked out.

10. MANUALS AND CAMPAIGN TOOLS FOR IMT AND IA STRENGTHENING

10.1 The completed manuals were designed for trainers and IA members. These include: (a) IA Strengthening Module, designed specifically for trainers, (b) Steward of Water, A Guide for Farmers, intended mainly for members, and (c) Maintenance and Rehabilitation Guide for Irrigators Associations. Three sets of campaign video programs were also prepared. The first video produced in the Phase 1 field survey, "A Day in the Life of Mang Conrado", was used as a campaign tool in the Phase 2 field survey. The contents of the two other videos were designed to (a) enhance NIA-IA partnerships—the video was titled "Enhancing NIA-IA Partnership in Irrigation System Management"; and (b) strengthen IA capacities—the video was titled "Approaches to Strengthening Irrigators Association".

10.2 A campaign poster meant to persuade IAs to become strong organizations was designed for use at representative NISs and IAs during the second field survey. The

Study Team prepared three (3) alternative campaign slogans, and these were used as a campaign tool in the Phase II field survey. Based on the comments from NISs and IAs, the draft campaign poster was refined for mass production. The Study Team opened a homepage of the Study on the NIA web site (URL: http://nia.da.gov.ph) with the following schedule and contents.

(a) Year 2002

August	:	Background, objectives, approach, schedule and methodologies of the study
December	:	Study results on classification of NISs and IAs, and summary of Interim Report
January	:	Survey activities and findings at the model project sites for formulation of IA strengthening action plan

(b) Year 2003

February	:	Introduction of GIS and database systems on NISs and IAs
March	:	Introduction of Action Plan for IA strengthening

11. IMPLEMENTATION ORGANIZATION, COST ESTIMATE AND EVALUATION OF PILOT IA STRENGTHENING PROGRAM

Organization for Project Implementation

11.1 Appropriate organizational structures will be established at the central, regional and field offices to facilitate the execution of pilot project activities. At the central office, a PMO based at the IDD will be established primarily for overall technical and financial coordination. A steering committee is also envisaged to provide policy direction. At the regional and field offices, counterpart offices will be established. Staffing for the proposed offices will utilize existing NIA personnel. Appropriate authority will be delegated to the proposed offices to prevent unnecessary delays in project execution. The region and field offices will be given flexibility to program their budget, preferably from their own income supplemented by funds from the central office.

Project Cost Estimate

11.2 Total cost for the pilot projects is estimated at about Php183 million (US$ 3.7 million), consisting of Php82 million (US$ 1.7 million) for institutional development and Php101 million (US$ 2.0 million) for system rectification. Total cost for the nationwide replication is estimated at Php 22 billion (US$ 440 million) covering the existing service area of about 490,000 hectares.

Economic and Financial Evaluation

11.3 EIRR for the pilot projects was estimated at more than 50%. Given this figure, the expected contribution of the project to the economy is enormous, and thus it is economically justifiable to proceed with the implementation. Financially, increase in farmers' net reserve is significant ranging from 19% to 340%, particularly for

farmers who do not own land. Increase in farm income is slightly smaller varying from 2% to 20% due to the small size of farm landholding. The average increase in net farm income varies from Php1,700 to Php3,110/ha (pilot area) and Php520 to Php1,400/ha (non-pilot area).

12. CONCLUSION AND RECOMMENDATION

Conclusion

12.1 The Study has presented an Action Plan deemed essential in the strengthening of the IAs. The Action Plan involves cost-effective concepts and approaches to improve the modality of strengthening the IA organization, formulation and execution of O&M plans and financial performance. These new concepts will be implemented based on availability and adaptability of local resources.

12.2 Physical rehabilitation of the systems will be required, but on a selective basis, to improve irrigation efficiency. The IAs must be made to co-share the responsibility of restoring systems with the NIA. Legal changes and/or changes in NIA's policy will be needed to remove legal infirmities surrounding the juridical status of the IAs. It is deemed imperative that a clearer and unified policy be formulated relative to: (a) IMT contracts; (b) IA membership enhancement; (c) ISF pricing and incentives; and (d) water rights.

Recommendation

12.3 The NIA should immediately implement the action plan envisaged for the pilot NISs. This should provide a good learning process for the implementation of an IA strengthening program for replication on a bigger scale. The NIA, therefore, must provide the essential budget and logistic support for institutional development to commence essential groundwork.

12.4 The nationwide replication should be packaged as a separate project for external financing given the huge cost. Given the configuration, the NIA should explore a program-type loan so that a number of the institutional costs can be funded.

12.5 The NIA should also address the impending reorganization before it can embark on a nationwide replication. The reorganization will allow enough elbowroom to execute the strengthening program, particularly in the choice and recruitment of people at the field level.

12.6 NIA should pursue to draw up draft policy and legal frameworks, and allocate

adequately more inputs in terms of personnel and budget to its divisions and departments in charge of institution and system management, for enhancing partnership with IAs and for sustainable irrigation development.

THE STUDY ON
THE IRRIGATORS ASSOCIATION STRENGTHENING PROJECT IN NATIONAL IRRIGATION SYSTEMS

MAIN REPORT

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Summary

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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	=	about 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 31st May, 2002)

US$ 1 = Php 50

US$ 1 = JPY 123

ABREVIATIONS

(A)	ADB	Asian Development Bank
	AFMA	Agriculture and Fisheries Modernization Act
	AFMP	Agriculture and Fisheries Modernization Plan
	AMRIS	Angat-Maasim River Irrigation system
	AO	Administrative Order
(B)	BOD	Board of Directors
(C)	CAR	Cordillera Administration Region
	CARP	Comprehensive Agrarian Reform Program
	CBU	Capital Build-up
	CDA	Cooperatives Development Authority
	CDF	Countryside Development Fund
	CE	Collection Efficiency
	CI	Cropping Intensity
	CIA	Council of Irrigators' Associations
	CIS	Communal Irrigation System
	CLT	Certificate Land Transfer
	CO	Central Office (NIA)
	CORPLAN	Corporate Planning, NIA
(D)	DA	Department of Agriculture
	DAR	Department of Agrarian Reform
	DBM	Department of Budget and Management
	DENR	Department Environment and Natural Resources
	DILG	Department of the Interior and Local Government
	DOJ	Department of Justice
(E)	EO	Executive Order
(F)	FIA	Federation of Irrigators Association
(G)	GA	General Assembly
	GAA	General Appropriation Act
	GIS	Geographic Information System
	GOJ	Government of Japan
	GOP	Government of the Philippines
(I)	IA	Irrigators Association
	I/A	Implementing Arrangement
	IACC	Inter-Agency Coordination Committee
	IBRD	International Bank for Reconstruction and Development (WB)
	IDD	Institutional Development Department, NIA
	IDO	Irrigation Development Officer
	IFR	Irrigation Fee Register
	IMT	Irrigation Management Transfer
	IOSP	Irrigation Operations Support Project (WB)
	IRR	Internal Rate of Return
	IRRI	International Rice Research Institute
	IS	Irrigation Superintendent
	ISF	Irrigation Service Fee
	ISIP	Irrigation Systems Improvement Project (ADB)
(J)	JBIC	Japan Bank for International Cooperation (Ex-OECF & EXIM)
	JICA	Japan International Cooperation Agency
	JSM	Joint System Management
(L)	LBP	Land Bank of the Philippines
	LGU	Local Government Unit
	LUWA	Local Water Utilities Administration

(M)	MC	Memorandum Circular
	MIS	Management Information System
	M/M	Minutes of Meeting
	MOA	Memorandum of Agreement
	MOOE	Maintenance and Other Operating Expenses
	MRIIS	Magat River Integrated Irrigation Systems
	MTP	Management Transfer Program
(N)	NAMRIA	National Mapping and Resource Information Authority
	NCIA	National Confederation of Irrigators' Associations
	NEDA	National Economic and Development Authority
	NFA	National Food Authority
	NGO	Non-Government Organization
	NIA	National Irrigation Administration
	NIS	National Irrigation System
	NISO	National Irrigation System Office
	NWRB	National Water Resources Board
(O)	ODA	Official Development Assistance
	OECF	Overseas Economic Cooperation Fund (Japan – Present-JBIC)
	O&M	Operation and Maintenance
(P)	PCA	Principal Component Analysis
	PCM	Project Cycle Management
	PDD	Project Development Department, NIA
	PDM	Project Design Matrix
	PIM	Participatory Irrigation Management
	PIO	Provincial Irrigation Office
	PIS	Pump or Private Irrigation System
	PMO	Project Management Office
	POW	Program of Work
	PRA	Participatory Rural Appraisal
(Q)	QUEDANCOR	Quedan Corporation
(R)	RA	Republic Act
	RIO	Regional Irrigation Office
	RIS	River Irrigation System
	ROW	Right of Way
(S)	SEC	Securities and Exchange Commission
	SPISP	Southern Philippines Irrigation Sector Project
	SMD	Systems Management Department, NIA
	SOEM	Systems Operation and Equipment Management, NIA
(T)	TA	Technical Assistance
	TNA	Training Needs Assessment
	TOR	Terms of Reference
(U)	UPRIIS	Upper Pampanga River Integrated Irrigation Systems
(W)	WB	World Bank (IBRD)
	WRDP	Water Resources Development Project (WB)
	WRFT	Water Resources Facility Technician