DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

PROJECT PAPER

for a

Proposed Project to Establish the

PHILIPPINES SMALL SCALE IRRIGATION

P R O J E C T P A P E R

PHILIPPINES: SMALL SCALE IRRIGATION

Food and Nutrition Category

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PART I

SUMMARY AND RECOMMENDATIONS

General Summary:

This paper describes the initial phase of a project to convert an aggregated area of 66,000 hectares of land (the long term potential is approximately 1,000,000 hectares) from a single crop to at least two crops per year from the same land. Irrigators Service Associations are formed to set up and operate small irrigation systems (up to 100 hectares in size). The associations are the conduits for technical and financial services from various government and private agencies. They serve as pivotal centers of information, skills development, training for self-government and other cooperative endeavors geared towards bolstering the productivity and income of their members. Irrigation systems, improved farming methods, processing and marketing practices as well as innovative technology designed to maximize labor, capital and land utilization are introduced to strengthen the status of the association and in turn produce important beneficial effects to thousands of low income Filipinos living in rural areas.

The project utilizes an AID grant and loan input of $7,300,000 together with a Philippine input of $11,600,000 equivalent in Pesos for providing technical and management services and credit resources available to the Associations. The project targets on improving the income level of 64,000 small scale farmers living in non-contiguous areas outside the reach of National Irrigation systems.

1. Borrower and Executing Agency: The borrower is the Government of the Philippines (GOP). The executing agency is the Farm Systems Development Corporation (FSDC), a new agency created and incorporated by Presidential Decree No. 681 on April 4, 1975. The FSDC assumes all the functions of its predecessor, the Barrio Irrigation Service Association (BISA) Program.

The FSDC is under the direct supervision of the Office of the President for purposes of policy direction and coordination. The corporation is capitalized at ₱800,000,000 level with authority to negotiate loans from any source up to $250,000,000.

2. Guaranty: This section does not apply.

3. Loan and Grant

a. Project Costs

(Dollars or Dollar Equivalent in Millions)

Funding Category	Disbursement Period FY 76	FY 77	FY 78	Total Obligation
AID Loan Inputs				
Commodities (Fx)	1.4	-	-	1.4
Credit Program (LC)				
i. Pumpsets	0.7	0.7	-	1.4
ii. Rehabilitation	0.7	1.1	-	1.8
iii. Farm Support Systems	-	0.7	1.2	1.9
AID Grant Input				
Tech Assist.	0.2	0.3	0.1	0.6
Training (FX)	0.1	0.1	-	0.2
Sub-Total AID				7.3
GOP Inputs				
Credit Program*	1.6	2.0	3.5	7.1
A/E Services	0.1	0.1	0.1	0.3
Program Admin.	0.7	0.8	0.9	2.4
Farmer (Labor)	0.5	0.6	0.7	1.8
Total Project Cost	6.0	6.4	6.5	18.9

*This does not include annual recurring production credit inputs by GOP through Masagana 99 and related credit programs.

b. Amount of AID Assistance

Grant	
Technical Assistance	$ 630,000
Participant Training	170,000
Loan (FX 1.4) (LC 5.1)	6,500,000
(Terms: 40 years, 10 year grace, 2% during grace and 3% thereafter)	
Total New AID Obligations	$7,300,000

AID agrees to finance the foreign exchange component of commodity requirements for the new Farm Systems Development Corporation and 50% of the local currency credit requirements during the first three years of the program. The overall contribution by AID to the first three years total project costs will amount to approximately 37.5%.

The total ten-year program consisting of Stages 1, 2, and 3 developments is expected to require funding in the amount of ₱2,000,000,000 ($286,000,000).

A loan amount of $6,500,000 together with an AID grant in the amount of $800,000 is proposed to fund 38.5% of first stage activities only. Further consideration for assistance to this program will be contingent upon findings of the first formal project appraisal review.

4. Project Costs

Credit Program

The loan will provide ₱35.6 million ($5.1 million) to FSDC to be used in conjunction with ₱50 million of GOP funds for a total of ₱85.6 million to establish a line of credit to organized groups of small scale farmers for investments in irrigation, crop production, harvesting and marketing facilities. The principal elements of the credit program are as follows:

a. Pumping sets - 10 million pesos ($1.4 million) of AID funds and ₱31 million from GOP funds will be used to finance loans to Irrigators

Service Associations for installation of irrigation pumping sets. An average of ₱1000 per hectare will be available at 8% interest for 5 years with one year grace period. This will affect 27,500 farmers.

b. Irrigation Distribution System - 30,000 hectares of land under previously installed pumping systems will be rehabilitated by completion of terminal facilities for properly distributing and managing irrigation water. An amount of ₱12.6 million ($1.8 million) from AID funds will be used for this element and the terms of borrowing to the ISA's (Irrigation Service Association) are the same as for the installation of new pumping sets.

c. Farm Support Systems - consisting of production equipment and marketing facilities - ₱17 million ($1.9 million) AID funds in addition to ₱9 million from GOP funds will be available for soil tillage, plant protection, harvest and post harvest equipment and facilities. ISA's will obtain these credits at 5-8 years at 8%.

d. Construction of Gravity Systems - GOP will fund ₱10 million for ISA credit to build small gravity diversion irrigation systems. The average cost of these simple systems is estimated at ₱1500 per hectare.

Commodity Element

₱10 million ($1.4 million) will be used for direct procurement of selected commodities consisting of vehicles, motorcycles, surveying instruments, office equipment and steel pipe. These commodities will be purchased from AID Geographic Code 941 sources and will be used by FSDC for carrying out program activities in the provinces.

AID Grant Input - Technical Assistance

An amount equivalent to ₱4.2 million ($600,000) will be provided over a three year period for funding the services of selected specialists particularly in the fields of pump engineering, water use and water supply engineering, agricultural engineering, earth dams, and ground water development engineering.

Training Element

Short observation type training abroad for selected FSDC personnel in Agricultural development planning, irrigation systems operation and maintenance, rural institutions, and water management will be

scheduled. It is anticipated most of the training will be in third countries; however, selected personnel in key disciplines will be sent to U.S. for one year academic training. An amount of ₱1.2 million ($170,000) is estimated as sufficient for this element.

Program Administration

GOP will fund through general budget an amount of ₱16.8 million for FSDC operations over the three-year period of the project. ₱2.1 million will be budgeted for providing project monitoring by a local A/E firm under contract to FSDC.

5. Project Purpose: The project aims to hasten rural development by increasing agricultural production and income through the efficient utilization of water resources from small scale irrigation systems to be built, owned, operated, and managed by farmer organizations called Irrigators' Service Associations (ISA). Improved farming methods, processing and marketing practices as well as innovative technology designed to maximize labor, capital and land utilization will be introduced into the farm systems through the ISAs. Linkages with other institutions pursuing the same objectives will be established to maximize the functioning of the ISAs as conduits for rural development.

6. Project Description: The total FSDC program consists of three stages with each stage having several phases. The first stage of the program which is the subject of this paper is to be completed within three years and consists of the construction of small irrigation systems for an aggregated area coverage of 66,000 hectares under new pump irrigation systems, rehabilitation of 30,000 hectares of previously built systems, and provision of farm support systems consisting of production, harvest, and post harvest facilities and equipment. The project will improve the income levels of 64,000 small scale rice farmers. The project design calls for close monitoring, supervision, and evaluation of 20 subprojects (2,000 hectares) located in 4 selected provinces (La Union, Quezon, Capiz, and Camarines Sur) where appropriate baseline data is being developed. Further details can be found in Part II Section 3-B - Evaluation Plan.

7. Justification: Efficient irrigation service is primary among inputs for increased agricultural production since investment for additional inputs is only marginally profitable without it. The organization of ISAs provides a strong basis for efficient management and upkeep of the

irrigation systems. Furthermore, the ISAs will serve as channels for effecting improved farming methods, processing, marketing schemes, and innovative technology. Such small-scale irrigation systems as proposed in this program do not have the disadvantages of large-scale irrigation systems, namely, the large amount of financing required, the long periods of irrigation system construction before water is made available to the farmers, and the difficulty of winning the commitment of the end-users to adequately operate and maintain the system.

8. Linkages and Assumptions: The Program planners envision a series of causative linkages among the different elements of the program design. If expected results at one level are produced, then the results at the next higher level will also be achieved.

Given the following inputs: training programs, technical services and financial assistance, it is assumed that the planned outputs will be obtained. In turn, it is assumed that the generation of outputs, to mention the major ones: Irrigators' Service Associations (ISAs), Provincial Task Force (PTFs), Irrigation Systems (ISs), Post-Harvest Service Centers (PHSCs) and loans, would lead to the set of expected conditions at the end of the program. These conditions represent the achievement of purpose, i.e., to increase rice production and farmers' margins in marketing rice. Finally, the attainment of purpose is examined to appraise its contribution to reach the goal of increased income, more employment opportunities and a more equitable wealth distribution.

The implementors of the Program are cognizant of conditions which must exist if the ISA's are to succeed at each higher level and/or those over which they have little or no control. Hence these critical assumptions have been laid down:

a. The FSDC program will receive sufficient support from the national government and international donor agencies;

b. Communal irrigation systems, modern farm practices and facilities will increase rice production and farmers' margins in marketing rice;

c. Extreme seasonal variations, weather conditions, other natural calamities and pestilence will not occur in the project areas in time and scale such as to adversely affect production yields by significant amount;

d. Increased agricultural productivity will generate increase in rural income; and

e. Income growth, more employment opportunities and a more equal distribution of wealth will promote the total well-being of the rural folks.

9. Recommendation: It is proposed that the first phase donor requirement of $7,300,000 consisting of a $6,500,000 loan funds and $800,000 grant spread over three years FY 76, 77, and 78 be made available for this project. Subsequent contributions will be considered after findings and deliberations of a formal evaluation of lst year activities.

PART II - PROJECT PAPER

1. Project Background:

a. Small Scale Irrigation Project

(1) History and Development of Proposal

The original initiative for the project proposal came from the Administrator of the National Electrification Administration (NEA). He realized the potential of these small scale irrigation projects which could be rapidly executed with relatively low level technical input requirements for increasing food production and consequent small scale farmer income while at the same time providing a day time electric power use demand for the rural electric coops.

In response to the NEA Administrator's initiative the Director of the BISA program prepared a preliminary project description including budget requirements for financing small pumping projects totalling 8,000 hectares of Lanao del Sur province in Mindanao. This was informally presented to the Mission in September 1974. USAID's initial response was in the form of an investigation of the overall BISA, since changed to FSDC program and field inspections in two provinces where BISA projects had been installed. Lanao del Sur was one of the provinces inspected. Based on the findings of field investigations and the review and analysis of the country wide program USAID determined that a project for introducing a more systematic approach involving the adaptation of more modern techniques would be highly beneficial in resolving some institutional

and technical deficiencies found in the program. USAID submitted a Project Identification Document (PID) describing the Mission's rationale, for supporting this sub-sector activity and suggesting the areas for inclusion in the project proposal.

Upon receiving AID/W concurrence with the PID the USAID irrigation advisor in consultation with the BISA program office prepared a Project Review Paper (PRP) which was given conditional approval by the review committee subject to satisfying two issue questions, namely: (1) expansion of information supplied earlier in the PRO's section on beneficiaries, and (2) clarification as to whether the project targetted on rehabilitation of existing irrigation systems or the construction of new systems.* Subsequent to this AID/W approval, a joint task force group was organized and assignments made for preparing a project paper.

The joint task force group reviewed the areas of concentration suggested by the BISA Director for conformance to general requirements of the selection criteria screen. Final selection of areas for concentrating supervision and monitoring under the AID loan project omitted Lanao del Sur Province in favor of other areas.

(2) Prior AID Assistance in Related Areas

During the early 60's USAID provided the services of a BuRec team under a PASA for completing surveys, studies, and reports on seven major river basins namely; the Central Luzon (Agno and Pampanga), Cagayan, Bicol, Cotabato, Agusan and Ilog-Hilabangan River Basins. In addition hydrologic data gathering instrumentation and materials were supplied by USAID to NIA and to the Bureau of Public Works (BPW). Prior to that the USAID has assisted the GOP with a massive rehabilitation program on irrigation projects during the 1950's.

Recent direct assistance by AID for irrigation in the Philippines has been the financing of feasibility studies and consultancies for the Angat-Magat Irrigation Project, the Bicol River Basin Project, and Laguna De Bay project. In 1972, following the typhoon flood disaster AID provided a $50 million special grant for rehabilitation of a scheduled list of extensively damaged irrigation and flood control facilities.

*See Annex R

Other assistance to the irrigation subsector of the Philippines has been through assistance to agriculture projects such as projects for agricultural credit, cooperative development, land reform, agricultural education and research, fertilizer, and rice and corn production. The technology introduced through these various projects is fed through the extension system to farmers of irrigated land.

The FSDC project directly supplements AID's Small Farmer Income Project by providing an action oriented medium for coursing presently known as well as newly innovated and feasible practices to the farmer/tiller. It supports the principles of the AID Land Reform Project by urging advance attention of the Department of Agrarian Reform to scheduled FSDC sub-project areas. AID's Provincial Development Assistance Project has been to a large extent responsible for providing trained Provincial and Municipal Development Staffs which are the frontrunners in establishing and supporting the local institutionalization of the basic recipients.

The Rural Roads project has as one of its objectives the development of rural transport routes which serve as an important element of the marketing infrastructure necessary for optimizing production gains produced through this project.

The AID Rural Electrification Project is the most active supporter of the FSDC. Since the inception of the predecessor BISA Program, the rural electric cooperatives have been the most active promotional boosters at the local level. Moreover, in many areas, many of the members of the electric cooperative are also members of the irrigation associations. The pumping sets using electric motors as the driving power source for operating pumps provide a day time power use demand important to the electric coops attainment of financial viability.

The Bicol River Basin Project serves as a rich resource of planning information particularly for assessing social aspects, farm mechanization, farmer training, and economic analysis. Additionally, the province of Camarines Sur is one of the key areas for monitoring and evaluating project effectiveness.

FSDC and the above mentioned projects are mutually co-supportive and USAID believes the amalgam of outputs from all the projects serve to reach AID's principal intended beneficiary, the rural poor.

(3) Other Donor Assistance

Assistance in irrigation from other donors aggregates over $115 million. The preponderance or 71% of this comes from IBRD, 21% from ADB, 6% from the Japanese Government, and 2% from UNDP. None of this assistance is being used directly for small scale irrigation. However, the Spanish Government and the Danish Government have made contributions through small loans for diesel engines as well as the Japanese Government through the 17th Reparations Agreement also for diesel engines and small pumps to be used in small scale irrigation development. No other donor has assisted in project development for small scale irrigation. This AID project is the first donor effort targeted at systematizing the development of viable small scale irrigation projects in the Philippines.

(4) Host Country Activity in the Project

The BISA Program, the forerunner of the FSDC, was the brainchild of Executive Secretary Alejandro Melchor, and the result of a series of discussions among representatives of the National Electrification Administration (NEA), the National Irrigation Administration (NIA), and the Development Academy of the Philippines (DAP). On October 23. 1973, the sub-agreement creating the Program was signed by Col. Pedro Dumol of NEA, Dean Alfredo Juinio of NIA, Col. Gregorio Vigilar of PDAP, and Dr. Onofre D. Corpuz of DAP. These four agencies agreed among other things, to coordinate closely with the provincial governments and to develop and implement the Program in the provinces by means of financial aid and technical guidance.

Teodoro C. Rey, Jr. of the DAP was assigned as BISA Project Director and a National Project Team (NPT) was formed to supervise the implementation of the Program at the national level. Capiz was chosen as the pilot province where the irrigation program was initially tested. On the basis of the total hectarage of irrigable areas, four other provinces (La Union, Abra, Ilocos Norte and Pampanga) were selected to comprise the first batch of provinces covered by the Program.

However, continuing with a sharply expanded program in response to popular demand, necessitates donor assistance for the program's consolidation and expansion. Specifically, funding assistance is imperative in view of the following features of the Program:

(a) The program's accelerated projected area coverage requires much greater funding to ensure the consolidation of the present coverage and to anticipate new problems that could emerge in the programs' accelerated coverage.

(b) To ensure the ultimate objective of rural development, the program has been redesigned not only to provide the primary irrigation systems but also the necessary production innovation packages for the full utilization of the opportunities made available by the irrigation system. Those production innovation packages consist of production skills training, adaption of modern farm production inputs, and the utilization of modern farm implements. Institutional building will also be emphasized to consolidate and develop the farm systems covered by the Program.

By January 1974, the Program moved the Provinces of Camarines Sur, Isabela, Laguna and Lanao Del Sur; three months later, it also included Cavite and Iloilo. By the end of Fiscal Year 74, the BISA Program had an area coverage of 16,793 hectares, 113 ISAs and 7,777 ISA farmer-members in its first 11 provinces.

By July 1974 expansion areas of 6,000 hectares were identified in the provinces of Ilocos Norte, La Union, Isabela, Camarines Sur, and Capiz. Eight more provinces, namely: Antique, Cagayan, Davao del Norte, Leyte, Negros Occidental, Pangasinan and Sorsogon were considered for possible inclusion into the Program. These have a projected coverage of 12,900 hectares utilizing 148 ISAs to serve 6,450 ISA farmer-members. Bataan was later included as a special project upon the request of its provincial governor.

To date, the BISA Program covers 27,977 hectares in 20 provinces, has 256 organized ISAs and a mass membership of 13,989 farmers. Forty-four of its pumps are now operational, irrigating 6,474 hectares of agricultural land.

This continuous expansion of the BISA, now FSDC, Program to more and more project areas can be credited to the enthusiasm, interest and commitment of the various provincial governments, local officials and farmers.

(5) Studies Done

USAID in a cursory examination of the 1974 BISA program and field inspections of two provincial programs prepared reports of findings. While these studies did not go into all aspects of the program in exhaustive detail, they were sufficient to identify the most outstanding problem areas affecting progress in the program. These reports were useful in conceptualizing the type of project needed. The U.S. Mission during recent years has shown concern for the problems of irrigation agriculture in the Philippines. In January 1974, USAID sponsored a workshop for the purpose of determining the specific problem areas in the irrigated agriculture subsector. The consensus at the end of the workshop was that management of irrigation systems, or rather the lack of a workable management system constituted the greatest bottleneck to realizing profitable returns from investments in irrigation development. It was further determined that the best approach in mounting an attack on this problem would be through farmer associations of water users.

(6) Views of the Country Team

As a project directed exclusively toward some of the poorest elements of the rural farm community this project underlines the declared interest of the U.S. presence for supporting the Government's attempts to extend investment benefits out to the more isolated areas and hence ameliorate the disadvantages of this segment of the population. Mission Management has played a prominent role in the activities and discussions leading up to the project proposal. U.S. Country Team agrees with the overall concept of the project and no adverse comments have been received.

(7) Opinion of Other Donors

This project has been discussed in detail with the Asian Development Bank (ADB) staff, all of whom expressed accord with the FSDC/USAID approach to small (100 has) farm development. Also implied in the IBRD agricultural sector analysis is support for this type project but neither they nor the ADB are staffed to undertake the first several years of institutional building required to assure project success; however, later, when development and training becomes routine, we believe both will be interested in assisting the project.

2. Project Description:

a. Goals and Objectives

The project is designed to increase production of rice and other irrigated crops and raise income of the farmers within the project areas. Complementary goals include the generation of increased employment opportunities and the development of rural leadership.

Specifically, the Project aims to:

(1) organize and develop irrigation system-based farmer organizations called Irrigators Service Associations (ISAs) in technically and economically feasible project areas.

(2) set-up and operate electrically driven pump irrigation systems in areas covered by electric cooperatives, diesel-driven systems in other areas, and development of small gravity supplied systems where practical.

(3) provide production, processing, and marketing assistance in the form of selected farm implements and post-harvest equipment and facilities.

b. Project Concept and Justification

(1) Project Concept

The project is premised on the concept of agricultural development through irrigation system-based institutions. It also emphasizes institutional development through the organization of irrigation water users. The project stresses that as a complementary process to irrigation development, the commitment and involvement of the end-users themselves, the farmers, should be an important prerequisite to successful irrigation service. Furthermore, inasmuch as irrigation is seen only as an entry point to agricultural development, the Project envisions that once the associations become viable, they would serve as effective channels for other essential production, processing and marketing services. Finally, it sees government participation in the developmental process as merely that of a catalyst. Therefore, these associations, once effectively and economically federated regionally and nationally would eventually take the role of the government in the process and would

be able to sustain and even expand themselves.

(2) Justification

The problem of inadequate production of rice, which is the primary staple food of the Filipinos, has plagued the nation time and again. The low rice yield has not coped with the rapid increase in population and the level of demand is expected to rise even higher in the years to come. Among the inputs for increased agricultural production, e.g., high yielding varieties, improved farming practices, credit and market development, a steady and sufficient water supply through efficient irrigation service is primary inasmuch as investments for additional inputs is not highly profitable without it. Therefore, the key to the country's agricultural progress is a proper irrigation scheme, and the FSDC through the Irrigator's Service Association, is assisting in a vital part of this overall scheme.

The installation of pump irrigation systems is not entirely a new approach to the solution of the food production problem. Rather, it is an improvement on the usual small farmer irrigation scheme and offers brighter prospects for assisting this heretofore neglected group of farmers. The usual approach has been the construction of centrally-controlled, large-scale irrigation facilities. A noted drawback of such an approach is the huge amount of financing required by such grand scale projects. At the same time, it involves intensive planning and long periods of project construction before water is made available to the farms. Another major drawback is the failure to get the full commitment of the end-users themselves, the farmers. This failure usually results in the mismanagement and non-maintenance of irrigation systems.

Under the FSDC Program a new approach has been devised to effectively carry out irrigation practices through the immediate installation of irrigation systems to be built, owned, operated, and managed by the farmers themselves. The approach is made possible through the organization of farmers into Irrigators' Service Associations (ISAs). The ISA will also play the lead role in planning and implementing agricultural production projects which will provide other essential agricultural services to its farmer members.

The essential features of the ISA are: it is a non-stock, non-profit service organization; its objectives are pursued along

cooperative principles and traditional Filipino cultural practices; it is the channel for technical and financial assistance from the government and private institutions; and it is the pivotal center of information, skills development, and training for self-government and other cooperative endeavors. (See Exhibit 1 Annex M)

To establish the rights and guarantee the benefits of farmer-members, a set of by-laws has been formulated defining duties and responsibilities. The registration of the ISA with the Securities and Exchange Commission gives it a legal identity which will enable it to engage in loaning and other business activities. Organizational cooperation and equal responsibility are concepts which will guide the ISA to ensure the successful installation and management of an irrigation system.

Improved farming methods, processing and marketing schemes as well as innovative technology designed to maximize labor, capital, and land utilization will be introduced to strengthen the ISA. Linkages with other institutions pursuing the same objectives will be established to optimize the use of the association as a conduit for national development.

The Program will establish irrigation systems for small areas averaging in size from 50 to 100 hectares which have been found to be technically and economically feasible projects. In addition the farmers' cooperation and commitment sought by the Program in the possible project areas will become the social foundation of Program implementation. As envisioned, the ISAs will be entirely composed of farmers and would serve as the unit cell which would pool the production potentials of the farmers in line with the national effort to attain food sufficiency.

Development Stages

For purposes of implementation, the Project has been divided into three stages, each stage subdivided into a number of developmental phases. In the actual implementation, the stages or phases overlap in the time scale as a continuum. (Annex L Exhibit 1)

a. Stage 1 - On-farm development of Primary Level Institutions

During this stage, associations are organized and strengthened

at the farm level. Irrigation and other essential agricultural services for on-farm development are introduced and implemented. This stage is the one to be assisted by the AID loan and grant.

b. Stage 2 - Area (Provincial/Regional) Development of Secondary Level Institutions

During this stage, the strengthened and viable ISAs will be organized into provincial or regional federations, services, e.g., operation and maintenance of systems, skills development, marketing and pools for economies of scale.

c. Stage 3 - Development of National Union of ISA Federation

During this stage, the federations would be organized into a National Union of ISA Federations. This union would take on all the functions of the Program Office.

Stage 1 Phases and Components

Stage 1 has three (3) phases and is designed for three years. The Project is so designed that each phase is inter-linked with the succeeding phase in implementation. That is, phase 2 is initiated and undertaken even before the completion of all phase 1 activities; similarly, phase 3 is initiated and undertaken even before the completion of all phase 2 activities.

Discussed below are the specific components and packages of Stage 1 phases. The schedules of activities of the phases of Stage 1 are discussed in greater detail in Part II, Section C - Project Implementation.

PHASE I

Phase 1 is geared toward providing the following two initial entries into the existing agricultural systems: (1) the organization of farmers into ISAs; and (2) the installation of farmer-built, owned, operated, managed, and maintained irrigation systems.

Through the institutionalization of the ISA, inputs in the form of irrigation systems, better farming and marketing skills and other essential agricultural services can be effectively channeled to the agricultural system.

The setting up of irrigation systems, on the other hand, present a concrete benefit that farmers can avail of by their participation in the ISA. It is also the most important input required to increase productivity.

Possible project areas are identified, investigated and subjected to initial project inclusion criteria (see technical analysis). Institutional and technical work will then be conducted in included projects, leading to the organization of the ISAs and the setting-up of the irrigation systems.

PHASE 2

Phase 2 involves: (1) Intensive education and training of ISA officers and committee members on organizational and irrigation system management; (2) Installation of organizational systems and procedures of the ISAs; (3) Evaluation and refinement (debugging/perfection) of the irrigation system; and (4) Introduction of production and post-harvest packages.

During the first cropping utilizing the irrigation system, the Association officers and potential members will undergo a training program for association and irrigation management. Specific and intensive training courses are given to the Board of Directors, the Finance Management Committee, the Audit and Inventory Committee, the Education and Training Committee, the Grievance Committee and the Irrigation Management Committees.

Operating systems and procedures of the Association, e.g., accounting and collection, water distribution, information and communication procedures, are installed and debugged for one cropping season. Moreover, the irrigation systems will be evaluated and necessary construction work, (i.e., lining of canals, construction of checkgates, installation of measuring devices) will be undertaken to optimize its performance. During this period and another two more cropping seasons, the program office provides adequate maintenance and repair services through the operation of mobile repair shops. Cost for construction and maintenance services are to be provided through commodity and financial loans and service contracts.

Second cropping activities would also include the introduction of the production and post-harvest packages. These are the following:

a. production skills training

Extensive training for improved rice farming practices will be conducted by the Program Office as well as through institutional link-ups

with other government agencies extension workers. An improved communications package utilizing printed matter as well as audio-visual media (through mobile filmequipment) will be used. A demonstration plot 250-500 square meters will also be set-up for testbed activities.

b. Credit program for production loans

The ISAs are to be linked-up to other government food production programs, notably, the Masagana 99 Program, using the Association as the channel and guarantor. Supervision requirements for the link-up would be provided by the Program Office of FSDC and extension workers.

c. Financing program for farm implements and post-harvest equipment.

Farm implements (weeders and sprayers) and post-harvest equipment (threshers and dryers) will be provided through the association. Owned by the association through commodity and financial loans, these implements and equipments will be rented out to farmer-members by the Association.

PHASE 3

Phase 3 further strengthens the institutional base through the continuous implementation of innovation packages utilizing the resources of the ISAs and provides project development training. Specifically, this phase consists of the (1) introduction and implementation of the marketing package; (2) the introduction and implementation of crop diversification and/or multiple cropping and livestock production.

During the fourth cropping after the completion of the irrigation systems, the marketing package will be introduced. This consists of the setting-up of warehouse and milling facilities, the provision of market information and linkage to market outlets. Operating systems and procedures are then installed and debugged during the next two cropping seasons. Construction and equipment costs are to be provided by way of commodity and financial loans.

Crop diversification and/or multiple cropping and a complementary livestock production program will be introduced and implemented. Project feasibility studies are conducted before suitable commodity and financial loans are provided for the purpose. This would not only optimize the

utilization of the irrigation system and the mill but would also provide additional income to the Association (see financial analysis).

3. Project Analysis:

a. Economic Analysis

General

The project will improve living standards and raise rural incomes of farmers affected. The primary quantifiable benefits from the project will come from increased rice production and higher farmers marketing margins.

The introduction of irrigation alone will increase annual palay production from 60,800 metric tons to 169,600 metric tons by FY 1977-1978, assuming an increase from the 38 cavan per hectare (National average for rainfed areas) for 1 cropping season to 53 cavan per hectare for each of 2 cropping seasons. The incremental gross annual revenue of the additional rice due to irrigation is worth ₱108.8M.

The production-innovation package is expected to further raise seasonal yields from 53 cavans per hectare to a conservative estimate of 70 cavans per hectare due to the use of recommended farm practices and loss minimizing processing equipment. This ultimate and very practical goal will increase the total annual production from 169,600 metric tons to 224,000 metric tons by FY 1978-79, worth ₱54.4 M.

Income Effects

About 64,000 farm families will benefit directly from this first FSDC project. Increase in income due to the different packages for a farmer tilling 1.5 hectares are summarized below and detailed in Annex 2.

NET DISPOSABLE INCOME

	₱	$ equivalent
Before project	1,555	222
With irrigation package	3,701	529

	₱	$ equivalent
With production package added	6,361	909
With marketing package also added	6,728	961

Since the average family has 7-9 members, the per capita income will increase from ₱197 to ₱468 with the irrigation system, and further to ₱805 and ₱852 with the production and marketing package respectively. Income to landless laborers would likewise rise due to the additional demands for crop planting and harvesting labor.

Beneficiary

The three-year FSDC/AID project expects to directly benefit some 64,000 small rice farmers. These constitute the greatly disadvantaged farmers whose economic productivity have been hampered by the complex interplay of exploitation by landlords, moneylenders and middlemen, the lack of technical expertise and other inadequacies in production and marketing requirements. These are the farmers who are often exploited by landowners because they are inadequately schooled and who are easy subjects to the manipulation of middlemen because they are disorganized.

The history of Philippine agricultural development is replete with experiences where assistance intended for disadvantaged farmers have instead served to benefit more the already affluent ones.

The FSDC is cognizant of such experiences. Thus, its program has been designed to insure that program benefits reach their intended beneficiaries. An important consideration is the establishment of linkages with the Department of Agrarian Reform so that farmer participants of the FSDC program be given top priority in the issuance of land title certificates or conversion to leasehold. This will enable the farmer to obtain sole possession or effective tenure at fixed rental of the land he tills and its produce; thus the benefits resulting from improving the land's productivity will be substantially his.

The concept of organizing farmers into association revolves around the principle that cooperative effort can accomplish far more than they can, individually, in their production and marketing activities. The

association facilitates the entry of production inputs and much needed capital. Furthermore, their being organized strengthens their position in the market and other sectors in the community.

The FSDC program invests heavily on training programs for efficient farm management and improved production techniques so that these farmers can optimize their productive potential.

Thus, while increasing his productivity, the FSDC program also aims to liberate the underprivileged farmer from his subserviency to landlords, moneylenders and middlemen and free him from the deprivation of economic opportunities and the lack of production capital.

Of course, benefits, both direct and indirect, will accrue to most of the other local commercial interests and the community as a whole as a result of increased production and marketing activities. It is assumed that social benefits will stem from the farmer's graduation to a viable economic producer from the level of subsistence farming. This is important to the relatively isolated farm communities encompassed by the FSDC program who have no foreseeable possibility to otherwise improve their situation.

Employment Effects

FSDC estimates that as a result of double cropping, labor requirements could potentially be increased by more than 100% or 5,024,000 man-days per year for rice farms. This would theoretically generate employment for 10,080 men every year and perhaps be provided to a large extent by landless families.

Moreover, the additional output from rice will create further employment opportunities in transport, milling, processing and supply of inputs.

Likewise construction has a large employment generation potential as it is labor-intensive.

Economic Rate of Return

The result of the base economic analysis of some of the original BISA projects in the four areas selected for bench marks in the monitoring

program: namely, Capiz, Camarines Sur, La Union and Quezon show an estimated internal rate of return (IRR) of 138.36, 127.86, 146.80 and 106.7, respectively for the whole package of irrigation and farm support systems. The economic desirability of each package is summarized below and detailed in Annex H.

IRR OF PROJECT COMPONENTS

	Capiz	Cam. Sur	La Union	Quezon	Average
Irrigation Package	143.27	133.14	164.20	709	137.39
Production Innovation Package *	102.10	102.10	102.10	102.10	102.10
Marketing Package *	102.61	102.61	102.61	102.61	102.61
Total Program	138.36	127.86	146.80	106.7	129.93

Sensitivity Analysis

The total package (i.e. irrigation, production innovation, and marketing package) was subjected to different changes of assumptions so as to examine the economic effects on the whole program. However, for practicability purposes, base analysis computed for the province of Camarines Sur was chosen in comparison with other sets of assumptions since this province is assumed to be representative of the 4 provinces.

Various price levels of a cavan of palay, increase in construction costs, and changes in palay yield were established to test the sensitivity of the whole program. The following is the summary of the sensitivity analysis:

(1) Construction Cost:

An increase by 20% in construction costs lowers the internal rate of return for Camarines Sur from 127.86% to 102.48%.

(2) Price of Palay Rice:

Reduction by 10% of the price of rough rice (palay) decreases the IRRs to 78.30% while increase by 10% of the price of rough rice also increases the IRR from 127.86% to 149%.

*These common economic rates of return are based upon common assumptions as to costs and benefits/ha. See Annex H.

(3) Yield of Palay Price:

The same effect in 10% decrease in palay yield is observed as in the 10% decrease in palay price. The IRR is lowered to 81.81%, while increasing the palay yield by 10% produces higher IRRs, an increase to 149.30%.

SENSITIVITY ANALYSIS
FOR CAMARINES SUR

BASE ANALYSIS IRR 128%

CHANGES IN ASSUMPTIONS	INTERNAL RATE OF RETURN
1. 20% increase in construction cost	102
2. 10% increase in palay price	154
3. 10% decrease in palay price	87
4. 10% increase in palay yield	154
5. 10% decrease in palay yield	87
6. Lengthening by one more year the construction period	111%

Balance of Payment Effect

The Philippines has been a net importer of rice for many years. Last year and the preceeding year the Philippines imported 166 and 336 thousand metric tons of rice, respectively, worth $39 million and $45 million. It is expected that by FY 1978-79, the increase in production will be sufficient to almost cover the present deficit.

b. Technical Analysis

1.0 Description

The technical staff of the FSDC program which is in charge of all technical activities, (i.e., conducting topo-surveys, field investigation, installation of pumping stations, construction supervision of the

irrigation system, operation and maintenance of the entire system) is composed mostly of registered engineers (i.e., Civil, Mechanical, Agricultural, and Geodetic). Engineers employed in this program are selected on the basis of their field of specialization, experience, capacity and capability to do their assigned task. In line with the objectives of the program, the technical people are provided with a series of training courses to develop their skills in designing, operation and maintenance of the irrigation systems, water management, farm land development as well as on-farm management practices needed for upgrading overall efficiency. Depending upon their expertise the engineers are assigned in each province.

The FSDC program has developed an organizational scheme geared towards implementation of all technical aspects. The attainment of the objectives of the project, therefore, hinges basically on organizational structure. Sponsoring agencies committed to render technical assistance are the National Electrification Administration (NEA), National Irrigation Administration (NIA), and Provincial Development Assistance Program (PDAP). USAID will assist particularly in training field engineers and in related institutional development of FSDC. A three-year grant funded technical assistance is built into the project design to address the most critical staff development needs.

2.0 Erection and Installation

2.1 Site Preparation and Installation

The FSDC field engineers initiate the conduct of all technical activities from preliminary investigation of the identified irrigable area up to the test-running of the irrigation system. After the preliminary investigation, the field engineers topo-survey the areas. The topographic surveys are handled by topo-survey teams of the FSDC Task Force composed of direct hire personnel and equipment obtained by the program and/or contracted to a competent private surveying team. The topo-survey involves data gathering, reduction or computation of these data, and plotting of topo-map. The purpose of the survey is to provide data on area topography to serve as the basis for intensive study in determining; (1) the extent of irrigable area, (2) water conveyance and management as well as (3) selecting design to be adopted to suit the irrigation need of the area. The study and planning of irrigation canals are done using the topographic map.

FSDC personnel make all feasibility studies, designs and cost estimates. Only sub-projects showing an internal rate of return greater than 20% will be undertaken. The cost estimates are then broken down for loan application described in the Technical Manual of Operation, (Exhibit 2-C(28) Annex H) and (Exhibit 1, 2 and 3 Annex I).

2.2 Irrigation System

The components of the irrigation system are:

a. Water supply system which consists of the following:

- pump (diesel engine or electric driven motor) or gravity diversion structure
- pipes and accessories (e.g., suction and discharge
- pipes, elbows, foot valve and nipple
- pumpsite structures (e.g., pump foundation, motor shed, forebay inlet works, stilling pool, and pipe supports).

b. Distribution and Conveyance System which consists of the following:

- canals (main, lateral and farm ditches)
- canal structures (headgates, checkgates, turnouts, flumes, siphones, drops and chutes).

The pump and motor foundation serve to stabilize the pump and motor systems. They are designed to minimize vibrations and prevent sinking or any lateral displacements of the system. The pump sump is an enclosure at the suction side of the pumping system to prevent foreign materials from clogging the footvalve strainer and also minimize silting. The stilling pool is the structure where the pumping system discharges water and is primarily designed to check water turbulence. It also stores water that may be used for priming the pump. It is also used to facilitate measuring water discharges from the system.

The motor shed and pump house protect the motor and pump equipment from the effects of weather.

The design of irrigation canal networks to be used, the scheme of water conveyance, structures and location of the pumpsite are prepared based on the topo-map. The canal layout and alignment are determined according to land ownership pattern to optimize the number of farms with service. Cross-sectioning of the water source and measurements of supply are also taken at the pumpsite. From the data obtained from river cross-section, actual pump, motor and accessories requirements are determined.

2.3 Organization of Farmer (Exhibit 1 Annex M)

Farmers must organize into Irrigators Service Associations (ISA) as the first requisite of the program to be eligible for loan financing. In its short span of operation, the Association has been successful in the recruitment of members with at least 85% of the farmers in the target areas joining an association. The qualifications for membership are prescribed in the ISA by-laws. As soon as the ISA is organized they elect five (5) members to a Board of Directors. A set of officers composed of the President, Vice-President, Secretary-Treasurer, and the Systems Superintendent are then designated as the Chairman of the Education and Training Committee, the Financial Management Committee, and the Irrigation Management Committee, respectively. A Grievance Committee is also created, the members of which are elected by the general assembly. The five (5) standing committees are each composed of one (1) chairman and two (2) members. Finally, the ISA is registered with the Security and Exchange Commission.

2.4 System of Farmers Commission

Evidence to date indicates the ISA has a strong membership. All members interviewed were well-informed about their rights and privileges as well as their duties and obligations to the association. The association provides a forum for collective decision-making and action in which all members participate based upon the principles of cooperation and mutual responsibility. Decisions made by the organization normally are well supported and members pay their irrigation and semestral fees promptly and regularly.

Since members are well-informed and are kept involved in the various undertakings of the organization, they can be mobilized into

work groups (i.e., construction crews to work on the irrigation system or to represent ISA for negotiations) when needed with a minimum of problems. They are also eager to learn modern and effective irrigation and farm practices.

Irrigation, a basic input for increased production has been recognized as economically profitable, leading to the adoption of new farm practices and irrigation schemes. Farmers are trained on cooperative commitment through the ISA. Members are also trained in technical aspects such as improved production methods and cultivation practices. Basic operating principles and techniques, maintenance procedures and water management are part of their training. The ISA is linked with existing institutions for production, credit, processing, marketing, farm to market infrastructure and extension services and facilities.

3.0 Procedure of application for water rights and source of water

After completion of the topo-survey irrigation designs and registration of an ISA, an application for water rights is submitted to the district office of the Bureau of Public Works (it is contemplated that this responsibility will be transferred to the National Water Resources Council). A copy of the ISA registration certificate, and Article of Incorporation, a location map of the irrigable area and a publication fee of P100.00 are submitted together with the water rights application. The FSDC field engineer helps the ISA member prepare and file this application by providing the technical information needed in the application.

The primary source of water is surface water from streams, rivers or lakes. Streamflow measurements are undertaken to determine amount of water supply. The water suitability for irrigating purposes is determined with assistance from the Bureau of Agricultural Extension Office.

4.0 Operation and Maintenance of the System

The Irrigation Management Committee (IMC) is responsible for the operation and maintenance of the system. This Committee is responsible for proper use and distribution of water and maintenance of the irrigation system. The members of the IMC are given periodic training in procedures, techniques and maintenance of the system including water management on the farm.

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Project Selection Criteria

One of the first steps in the development of a subsector loan for irrigated agriculture development is the undertaking of a study to analyze pre-determined criteria which the proposed development should meet.

The key elements of this activity appear to be:

(1) Profitability in terms of return on investment

Factors = (a) Soil and land capability

(b) Water supply sufficiency and quality

(c) Access to markets

(d) Installation cost of irrigation system

(e) O & M cost of irrigation system

(f) Availability of credit and reasonable terms

(g) Degree of land fragmentation

(h) Assured market at forecast price

(2) Social and cultural environment -

Factors = (a) compatibility of farm families in project areas

(b) willingness to commit resources to development, motivation for self-help

(c) potentials within community for entrepreneurship/management

(d) willingness to provide mutual guarantys and encumbrances

(3) Implementation capability

Factors = (a) Provincial capability to support project

(b) Municipal support

(c) Barangay support

(d) National Program Support, i.e., Production, Marketing, Financing agencies of Government.

Criteria:

1- System Benefit/cost ratio must exceed one.

2- All production inputs must be available - credit, fertilizer, plant protection materials, seed, extension, and technical know how. These must either be available or be able to be made available.

3- There must be a market available for the crops at the price forecast.

4- There must be strong bank or alternative credit agency capacity to assume successful loan implementation.

5- There must be potential for a strong organization and farmer willingness to participate in and contribute to the project.

6- Project area must not only be irrigable but also drainable.

7- Water supply must be available and sufficient both in quantity and in quality.

8- The area must be accessible.

9- Right of way guarantee.

10- Area must be free of litigation re land disputes.

c. Social Analysis

This section includes an analysis of the possible impact of the project on the socio-cultural tradition and values of the people in the areas covered by the Project. Particular emphasis is given to the role of women in the Project and its possible impact on the women in the areas.

The role of women in rural development has long been recognized by local social science researchers. For example, Bustrillos (1961), in her study of food management practices of homemakers in the rural areas, found that the wife usually acts as the rural family's main decision maker. As such, she can be a potent sub-agent of change. The researcher suggested that in introducing any innovation in the rural areas, fieldworkers might get faster results if they work through the wives of farmers.

Feliciano's (1965) findings confirm the active participation of the wife in decision-making regarding farm operations. Majority of the farmer-respondents said they make decisions in the farm with prior consultation with their wives.

Succeeding studies further support earlier findings on the role of women in farm decisions. Guerrero (1966) noted that buying land, borrowing money for the farm, and decision on what to plant are regarded more as joint husband-wife rather than husband-only decision.

Madigan (1969) in his study on why farmers resist change, found the housewives among the factors which contribute to this resistance. This made him suggest that fieldworkers should take into consideration the housewives when seeking support for community development programs, even where these programs are intended for husbands.

Castillo (1969) explained that "the pervasive influence of the Filipino wife in farm-business decision derives from her role as uncontested family treasurer with facilitative or veto power on expenditures."

Considering the role played by women in farm decision making, they can help a lot in setting regularly the financial obligation of the Irrigators' Service Association members. Perhaps women can serve as efficient treasurers in the associations, since this is the type of job that they are so used to even in their homes.

Involving women in the Associations will make them real partners of farmers in agricultural development. This will give them also the chance to become leaders of these associations. Consequently, this may liberate them to develop fully their potential and contribute more to rural development.

The project is relatively new, hence it might be too early to assess its impact on the socio-cultural traditions and values of the people in the area. However, if we can piece together some studies on the consequences of irrigation system, we might be able to see some of the possible socio-cultural impact of the Project.

A study of irrigation in Ilocos Norte revealed that the zangjeras (irrigation system) were important political force. The backing of several irrigation systems or zangjeras could widen and extend the scope and effectiveness of a politician's alliance system. Thus the irrigation societies of Ilocos Norte provides at least some political support together with a high degree of voter predictability (Lewis, 1969).

Thornton (1968), in his intensive research on the different kinds of irrigation systems in India and Sudan, observed that the provision of irrigation water to farmers entail a complete revolution of his way of life. Even if the water is to be used only to increase the food supply for a growing population, irrigation implies not only a change in food crops grown but a major change in the length of the growing season and pattern of work. It also implies new relationships with authorities in water regulation and collection of dues.

Coward (1969) believes that organizational changes in irrigation system will provide rules and roles that (1) are more congruent with the physical facilities of the irrigation system, (2) will identify and diffuse new information and knowledge, and (3) will provide positive incentives to the water users by rewarding preferred water-management practices.

Earlier studies on communal irrigation systems reveal the minimal existence of a sense of community responsibility and the virtual absence of established operation procedures for maintaining and managing the system and distributing water. Communal irrigation systems operate in at least three ways:

1. By tradition or inheritance someone is assigned the honorary position of being in charge of the irrigation system, and people look up to him for leadership.

2. Where there are constant disputes among the farmers themselves over water use, they seek the assistance of an authority figure outside their group, that is, a policeman, a mayor, or a landlord, to help allocate water and assign maintenance functions to different members of the community.

3. The person in the worst position with respect to the water supply takes the initiative in calling the farmers together for the periodic cleaning of canals, water distribution, and so on.

Thus earlier irrigation systems existed on an ad hoc basis. Whenever necessary, farmers can be mobilized immediately for group action. But sustained, regular and systematic management is hard to find in these so-called communal irrigation systems (Ongkingko and Castillo, 1969).

Coward (1968) concluded that "improved organization is more significant for agricultural reform than is transfer of ownership". He noted that the preliminary data presented for the Rizal irrigation cooperatives, in addition to the evidence on the zangjera systems, suggest that farmer-owned organization can be viable. What is needed, he said, is extended training of both government water authorities and the water users. The training program should deal with the technology of water management and the social-know-how of assisting attempts by water users to develop rules and roles to improved water management.

The project will also encourage farm mechanization. Experiences in other countries have shown that farm mechanization can result in social dislocations. These are anticipated by the FSDC Program and alternative solutions are now being planned.

The introduction of loans for acquiring farm machinery might drive the ISA members to buy machines without making any long-range plan of mechanization or without making a careful plan of repaying their loan. For example, in Niiki Mura, Takamatsucho, some financial help for farm mechanization had driven each household to acquire small machines and equipment; large-scale mechanization, however, was not realized.

Farm mechanization might also dislocate traditional leadership pattern in the areas covered by the FSDC Program. For instance, in Japan, when the village accepted the mechanization project, farmers who had a keen interest in production for market evolved as leaders.

A shift in leadership might consequently lead to the abolition of the traditional leadership system. There can be a shift from a "boss system" to a "group leadership system." For instance in Japan this process even lead to the alteration of the social order. The once pyramid structure even became flat.

As farm mechanization advances, dependence on family labor may become less and less. This will relieve the women and the old as more and more machines are introduced. This will allow women to shift to non-farm activities, such as cottage industries, and leave farming to their husbands.

Farm mechanization is also likely to bring some changes in farm operators. As observed in Japan, when farm mechanization started, the young came to hold the leadership and replaced the old. This was because plowing by power cultivators became too difficult for the old, who then went to some lighter and less important work. When machines were brought in, buffaloes were disposed of, the basic ground of the old people's right of management was shaken.

Anticipating some of these consequences of farm mechanization, the FSDC Program emphasizes institution building activities with a built-in progressive stage and continuing training program for the ISAs. Other

activities responsive to the impact of farm mechanization will be introduced to absorb causal displacements.

The evaluation plan will attempt to measure the overall social impact of the program. Social progress indicators identified in the evaluation plan constitute an extra measurement beyond those required for determining the degree of progress toward achieving stated project objectives.

d. Policy Analysis

Rice Policy

The price of rice is a political as well as an economic factor due to its being a wage good which is a major determinant in the cost of living. The share of cereal and cereal products, the majority of which is rice, averaged 37% of food expenditures and 20% of total income in 1971; therefore any increase in the price of rice has an immediate impact on the cost of living of low income people. Thus, there has been a consistent GOP national policy towards controlling the price of rice to urban consumers.

On the other hand, the government has also realized that increased production is necessary if large imports of rice are to be avoided. Thus, there has been an effort to support the price for producers at a high enough level to be conducive to increased production. These two policies are often in conflict resulting in either low profit margin for the producers or low margins for the processing and distribution of rice.

The current method of implementing these policies has been to impose a price ceiling at the retail level on rice and subsidized inputs to the farmer. However, because of the extreme inflationary pressure on the input side, the subsidy is now insufficient to insure a return to these inputs and their use is declining. The holding of a constant price for rice during inflationary periods means that the real price of rice is declining, thus producers, millers and retailers are caught in a classic cost-price squeeze.

In the long run, production must continue to increase at the rate of 2-3% a year just to maintain the present position. The latest analysis of demand indicates a very low negative income elasticity.

Because of the importance in the diet, rice is also price inelastic (about .5). That is, small changes in output create large changes in price. There are investments being made in agriculture such as irrigation and infrastructure but it is not likely these will result in long run increases of greater than 3%, thus, price levels are likely to be maintained at current real price levels or more. However, output and variation due to weather will cause variation in this price level.

GOP Incomes and Employment Policy

Overall National Objectives and Income Targets (Four-Year Development Plan 1974-77)

The GOP sets forth the following objectives in the current Development Plan:

1) promotion of employment

2) maximum economic growth feasible

3) more equitable income distribution

4) regional development and industrialization

5) promotion of social development

6) maintenance of acceptable levels of price and balance of payments stability

The GNP (at constant 1967 prices) is targeted to increase by 7% in FY 1975 and 76, and 7.5% in FY 1977. Assuming a population growth rate of 3.0 percent, per capita GNP will expand by 3.8% per year from 1974-77. The agricultural sector growth target is 4.8% per year. In order to attain these targets, investment will have to increase by an average rate of 9.8% per year.

Essentially, the basic development approach calls for raising rural incomes and achieving self-sufficiency in food production. These are to be attained mainly through the implementation of food production and land reform programs, both complemented by the development of cooperatives and infrastructure, particularly irrigation and feeder roads in the rural areas. The Government has followed and will likely

continue to follow a policy of keeping the basic price of rice low. Subsidies on farm inputs and credits will be used to maintain and improve farm incomes.

Simultaneously, in the industrial sector, the thrust will be towards the promotion of employment opportunities through the encouragement of labor-intensive methods of production, the expansion of manufactured exports, the strengthening of industrial linkages, and the intensification of efforts at regional development. Special attention shall be given to the development of export-oriented industries and rural medium-and small-scale industries.

The overall development is to be supported and sustained by infrastructure development which will provide for the setting up of an efficient network of roads, portworks, railways, airports, as well as power generating, telecommunications, and water resource facilities.

Employment

Although the Four-Year Development Plan contains a separate Chapter on employment, the whole plan itself is attuned to the goal of employment generation. Accordingly, all programs in the Development Plan are directed towards generating more employment opportunities.

The present unemployment problem can be traced to three main factors, namely: the rapid rate of population growth which is directly related to the growth in the labor force, the educational system which has not adapted itself to development needs, and policies which have encouraged growth based on capital-intensive methods at the expense of labor.

The employment program therefore aims at correcting these causes through the vigorous implementation of the family planning program, the restructuring of the educational system, and the redirection of policies towards the goal of employment generation. Unemployment of the labor force was reported at 6.9% in 1972. Underemployment, measured by people wanting additional work constituted 14.2% of total employment. Unemployment is considerably lower in the rural farming areas. However, with the traditional one-cropping of rice per year, there is strong seasonal underemployment. Over the 4-year plan period, the economy is faced with the task of generating jobs for about one million currently jobless workers and about 2 million entrants to the labor force (14.2 million total labor force in 1972). The national

employment targets include a 4.5% increase from FY 1975-77. Accordingly, at the end of this Plan period, the unemployment rate shall have been reduced from almost 7 percent in 1972 to not more than 3 percent in 1977. The growth in employment is expected to come mainly from the stepped up economic activities since there is a close tie-up between the labor absorptive capacity of the economy and production growth.

Some selected measures and policies to increase employment include:

1) Presidential Decree No. 92 which defines incentive for potential investors, also incorporates a provision for deduction of labor training expenses from the taxable income to encourage the upgrading of the productivity of unskilled labor.

2) The Board of Investment has built into its Priorities Plans provisions for generating greater employment by highlighting labor intensification as a criterion for approving projects.

3) Special export incentives encouraging labor intensive manufactured goods.

4) Employment oriented labor laws.

5) Labor intensive government projects, e.g., rural work brigades for infrastructure development.

6) Land reform programs and its effect on raising productivity and incomes of small farmers.

7) National manpower and incomes of small farmers and its accelerated program for vocational training among out-of-school youths.

8) Regional development and expansion of the cooperative movement.

9) Expansion of the tourism industry which is highly labor intensive.

The national rice and corn production programs (Masagana) have effects on increasing labor use on farms. The package of technology,

which is financed by non-collateral credit, requires more care and labor in application of fertilizer, agro-chemicals and on use of high yield varieties which require more weeding.

These two programs (rice and corn) presently cover about a third of rice and corn farmers. Planned expansion of the programs will bring the total participation to over half of the farmers by 1977.

Rural Development and Popular Participation

Current GOP policies are strongly canted in the direction of rural development. Substantial land reform has already occurred, with all rice and corn estates above 24 hectares broken up; propsects are good that the program will soon be extended downward to 12 or even 7 hecatres, ultimately benefiting between some 400,000 tenants.

Infrastructure policies include road building, which provides substantially increased services between rural and urban areas, and stepped-up activities in the construction of farm to market roads. (AID currently is financing a rural road program). The importance of irrigation, whose direct benefits are entirely designed to promote rural development, has just been dramatized by the opening of the biggest man-made structure in the Philippines, the Pantabangan Dam, which irrigates 77,000 hectares. Meanwhile government lending agencies have been instructed to look favorably on financial assistance for irrigation systems all the way to the village level.

The government is firmly committed to increased emphasis on regionalization as a means towards increased rural development. The National Economic Development Authority now has regional offices to help promote such activity, and the Board of Investments offers financial incentives to those desiring to start businesses in the rural areas.

Popular participation, so far as the rural areas are concerned and judged on the basis of real rather than symbolic activity, has increased since martial law, though it is still marginal. In place of periodic political rallies where farmers mostly voted as the landlords' representatives dictated, regular meetings of farmers are held in which they are indoctrinated in the basic tenets of effective cooperative activity. The campaign is based on top/down strategies which emphasize discipline and responsibility during the early stages but are designed to create the institutional and attitudinal groundwork for expanded popular participation at later stages.

The Deparment of Local Government and Community Development (DLGCD) promotion of the pre-cooperative, Samahang Nayon, has created the beginnings of an effective national cooperative system, while the rural barangay (smallest political sub-unit) despite the top/down quality of its promotion, has encouraged greater popular participation than in the past practice if not the theory, of the old barrio (now called barangay) council. The DLGCD has carried on most of this organizing activity through community development personnel who are true believers in popular participation.

e. Financial Aspects

Eligible projects. Eligible for financing by the Corporation are:

(1) Farm Support Facilities and Equipment

(a) Irrigation systems, including pumps and engines.
(b) Storage facilities.
(c) Sprayers, grain driers, threshers and miscellaneous attachments.

(2) Farm Mechanization

(a) Tractors, including implements and associated equipment.
(b) Power tillers, including attachments.

(3) On-Farm Transportation Equipment

(a) New trucks, jeep and trailers
(b) Reconditioned trucks, jeeps and trailers with warranties of not less than 10,000 kms. or 6 months.

(4) Modernization and expansion for restoration, improvement or enlargement of the above facilities and equipment.

Qualification and eligibility of Borrowers. The following are qualified:

(1) Irrigation associations existing with a minimum of 5 farmer-members and covering an area of at least 30 hectares of agricultural land.

(2) Other farm-based associations, cooperatives, corporations duly registered with the Securities and Exchange Commission or DLGCD with agricultural projects and/or agricultural lands to be developed or improved or intending to render direct agricultural production services.

Loan Limits.

(1) The amount of the loan shall be based at an average of ₱1,000.00 per hectare, varying according to the needs of the project and area hectarage covered by the borrower in its operations.

(2) The amount of the loan to be granted will depend on the needs of the project, and the borrower's paying capacity and credit worthiness. A debt-equity ratio of 90:10 shall be maintained. The borrower's equity contribution can take the form of cash, construction materials or labor inputs.

Terms of the Loan.

(1) Interest - The loan shall accrue interest at 8% per annum on the principal amount outstanding or such other higher rates as may be prescribed by the Board. Such interest shall not be collected in advance.

(2) Repayment Period - The repayment period will be based on the expected cash flow generation of the project not exceeding the economic life span of the asset financed. The following are the imputed economic lives:

(a) Farm Support Facilities
Pumps and Engines - 5 years
Threshers, Grain Driers, Sprayers, etc. - 5 years

(b) Storage Facilities - 8 years

(c) Farm Transport Equipment
Light - 5 years
Heavy - 8 years

(3) Repayment Schedule - Amortization of the principal and interest may be made quarterly, semi-annually or annually. Repayment shall commence one year after the start of normal operations. A one year grace period may be granted when justified.

Collateral Requirements. The loan shall be secured by any or a combination of the following:

(1) Chattel mortgage on the assets acquired from the proceeds of the loan.

(2) A deposit of a given number of cavans of palay, a corn, or the agricultural produce, the value of which is equivalent to the amount of one amortization, in a bonded warehouse with warehouse receipt duly endorsed in favor of FSDC.

The FSDC may advance the insurance premium on the collateral, such advances to be charged to the account of the borrower subject to prior notice. Such advances shall not be financed out of the proceeds of the loan and shall therefore fall under a separate arrangement.

Loan Application and Processing. FSDC shall make loan service arrangements with the various Rural Banks and Electric Cooperatives through the National Electrification Administration (please see attached process flow chart for alternative arrangements).

(1) All applications for loan shall be made by submitting a properly accomplished application form prescribed by the FSDC together with the necessary documents, required to support such application. Applications shall be filed with the nearest Electric Cooperative or if such is inexistent in the area, the Rural Bank in the locality.

(2) Within two (2) weeks from date of receipt of the loan application, the Rural Bank or Electric Cooperative whichever is the case, shall immediately conduct a credit investigation, verification of the project to be financed and the collateral offered.

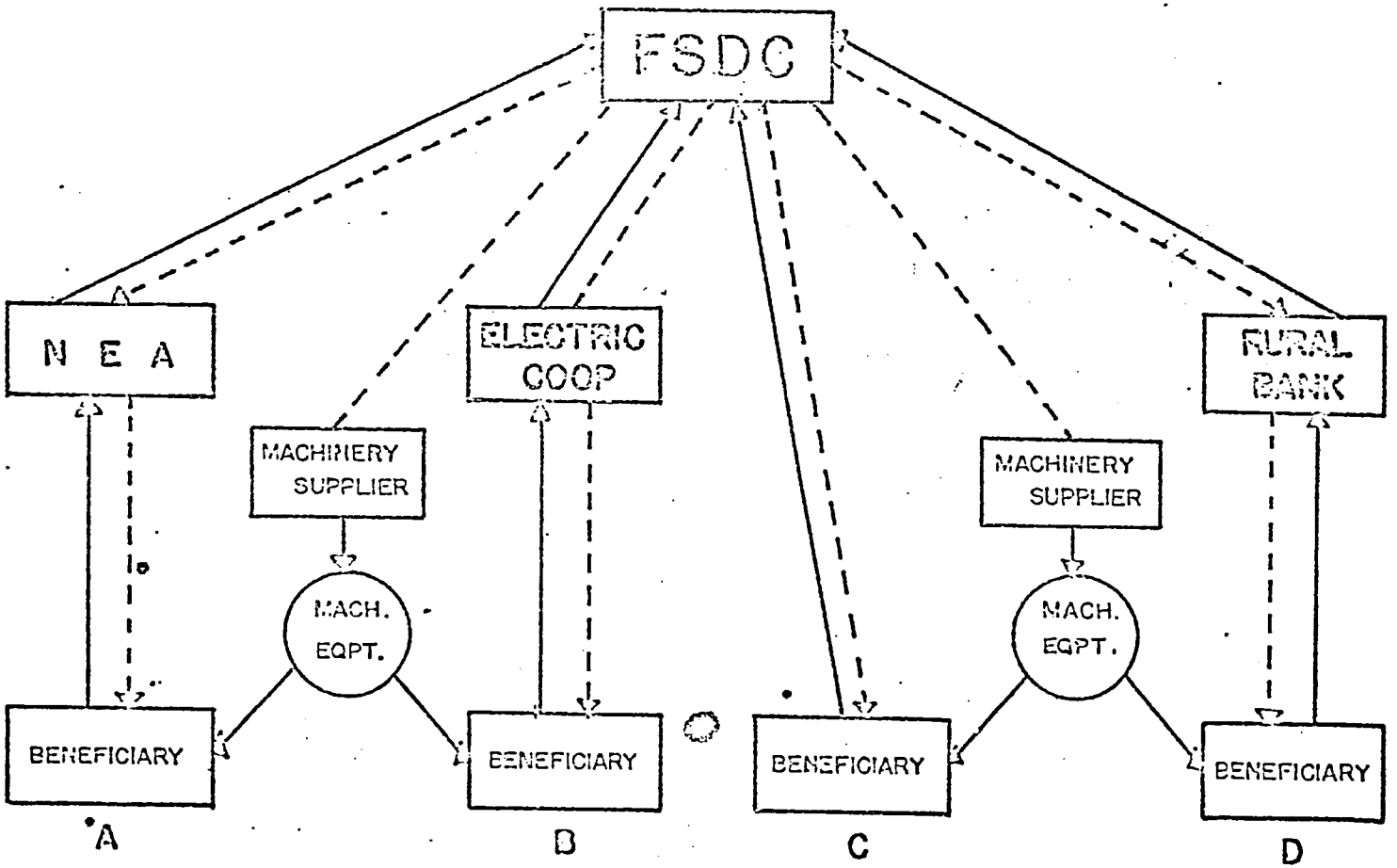
(3) The application, together with the credit report and supporting documents must then be forwarded to the FSDC for further evaluation, processing and decision. FSDC shall act on the application within two (2) weeks from date of receipt.

(4) Upon approval of the loan application, the Electric Cooperative or the Rural Bank and the applicant-borrower are informed.

Loan Release.

(1) Loan releases may be made in full or in a staggered manner depending on the needs of the project. Releases will be made only upon compliance of certain requirements, e.g., formalizing mortgage contracts, putting up equity participation, etc.

(2) It is preferred that farm facilities and equipment to be financed by FSDC shall be procured under a "linkage" arrangement with suppliers who have active accounts with the Development Bank of the Philippines (DBP) or under a medium-term deferred payment plan with payments to the supplier guaranteed by FSDC.



ALTERNATIVE ARRANGEMENT FOR LOAN PROCESSING AND LOAN RELEASE

Legend:

——→ Application, processing and collection of loan.

------→ Loan Releases

Extension Period.

In cases of default on the service of the loans arising from fortuitous events or in other cases justified in the opinion of the Administrator, the FSDC may grant the borrower a reasonable extension period subject to the approval of the Board.

Loans in Litigation.

There shall be collected from the borrower in addition to the interest, an attorney's fee equivalent to 10% of the unpaid balance which shall in no case be less than one hundred pesos (₱100.00) and costs of the suit.

Procurement of Farm Implements and Equipment.

Procurement of Agricultural Machinery and Equipment, including irrigation system shall be limited to dealers who agree to provide the necessary training in the proper operation, care and upkeep of the machinery and equipment purchased, and who shall have immediately available, should the necessity arise, spare parts and technical men at strategic places for repair and replacement of the agricultural machinery and equipment.

Assessment of Capability of the Rural Banking System to Process Loans.

The Rural Banking System (created under R.A. 720 in June 6, 1952) whose main objective is the extension of credit to farmers for agricultural purposes has proved its capability of processing such loans.

As of 1973 rural banks have been established across the entire country with total resources amounting to ₱1,382.6 M. In 1973 alone, a total of 750,000 borrowers were granted loans totalling ₱1,073.7 M. The loans which registered an increase of ₱288.5 M or 367% from that of 1972, were extended for agricultural (91.0%), commercial (6.4%), industrial (1.9%), and miscellaneous (0.7%) purposes.

Rural banks are regulated and supervised by the Monetary Board through the Department of Rural Banks and Savings and Loan Associations (DRBSLA) of the Central Bank.

Assessment of Capability of National Electrification Administration Cooperatives to Process Loans.

The NEA (created by P.D. 269 with an authorized capital stock of ₱1 B) is capable of processing loans since it is basically a lending institution directed to grant to public service entities, especially cooperatives, loans necessary for the construction, operation, and maintenance of power generating systems for supplying electricity to the countryside.

As of June 30, 1974 NEA electric cooperatives have actually served 788,000 people in 122 municipalities and 225,000 residents in 7 cities. It has organized 31 electric cooperatives covering 201 towns and 129 cities in almost every province of the country.

Below is a summary of the NEA Loan Operations as of June 30, 1974:

Projects Funded by EA/NEA Loans

Types of Projects	Number	Approved Loan Amounts	Loan Releases
Cooperatives	61	₱ 739,795,611.00	₱ 141,443,046.00
Private Franchises	43	15,736,069.00	12,258,654.00
Municipalities	152	20,787,378.00	15,045,699.00
	256	₱ 776,319,058.00	₱ 168,747,400.00

Loans Approved, Released, and Collected

Item	FY 1973-1974	Cumulative
Loans Approved	₱ 93,004,036.00	₱ 776,319,059.00
Loan Releases	93,286,208.00	168,747,400.00
Loan Collections		
Principal	215,601.00	1,200,793.00
Interest	224,124.00	1,874,006.00
Surcharge	141,724.00	756,500.00
Total	₱ 581,453.00	₱ 3,831,299.00
Loans Outstanding		₱ 167,546,608.00

f. Administrative Analysis (Institutional Capability)

The Farm Systems Development Corporation (FSDC), a public corporation created under Presidential Decree No. 681 on April 4, 1975, has overall responsibility for the execution and administration of the project. It is directly under the Office of the President for purposes of policy direction and coordination.

The FSDC assumes all the responsibilities of its predecessor, Barrio Irrigator's Service Association (BISA) Program. Since transitory provisions have been made to effect the turnover of the BISA Program to the FSDC and since the majority of the FSDC Board of Directors were the policy-makers of the BISA program, the administrative or institutional capability of the BISA program, as proven in its formation of 256 ISA's with 44 fully operational irrigation systems in 20 provinces, will be acquired by the FSDC.

All the powers of the corporation are vested in and exercised by the Board of Administrators composed of the following: the Executive Secretary to the President of the Republic of the Philippines who is Chairman of the Board, the National Irrigation Administration Administrator, the National Grains Authority Administrator, the Development Academy of the Philippines President, the National Power Corporation General Manager as regular members and the FSDC Administrator as ex-officio member. The Administrator executes and administers the policies, plans and programs and the rules and regulations promulgated by the Board of Administrators through its Board Secretariat.

Under the office of the Administrator are the following staff units: (1) the Corporate Auditor's Office which is responsible for the auditing needs of the FSDC; (2) the Operations Control Officer in charge of overall monitoring and management of the FSDC's projects; (3) the Research and Evaluation Office which undertakes all research and evaluation needs; (4) the Special Services Office which undertakes all informational and communication needs; and (5) the Corporate Planning Office which undertakes loans negotiations from foreign entities; studies assumptions regarding political and socio-economic conditions and corporate resources; and analyzes plans, corporate goals, and strategies of implementation.

Also under the Office of the Administrator are the following five departments: Plans and Programs, Engineering, Finance, Operations, and Administrative.

The Plans and Programs Department consists of the Agricultural Projects Development Section which supervises the development of the FSDC's agricultural projects such as the introduction of innovation packages into the ISA's and the Management and Organization Development Section which supervises the training for management and organization of the FSDC staff and of its other units (PITs, MITs, and ISAs).

The Finance Department with overall responsibility for all of the FSDC's financial activities consists of the Financial Feasibility and Evaluation Section; the Financial and Loan Accounting Section; and the Financial Planning and Programming Section.

The Engineering Department supervises the engineering activities of the FSDC and its projects, i.e., topo-survey of proposed service area, design of pumping and water distribution systems, estimates of construction cost, procurement of pumps and other project equipment requirements, supervision of construction of pump site structures, water diversion, and distribution systems; supervision of the installation of pump, motor and other required accessories; final testing of pump and water distribution system; training in technical aspects of water management; installation of post-harvest facilities and services; grading and standardization of products.

The Administrative Department is in charge of the FSDC's general corporate accounting, legal and documentation requirements, personnel and general services, cash management, property management, and library/records management.

Aside from responsibilities in special projects the FSDC may undertake, it is the main function of the Operations Department to undertake the actual execution of the small-scale irrigation systems Project through the Project's Provincial Task Forces which directly implement the Project in the target areas.

Organizational Chart of the FSDC is in Annex K, Exhibit 1. Staffing pattern of the FSDC is in Annex F. Table of activities indicating administrative responsibilities, including the functions of non-FSDC units, is in Annex K, Exhibit 3.

The PTF's to be established in each project province are composed of: (1) an Institutional Development Group (in charge of ISA organization and other related activities, (2) a Technical Group to supervise construction of the

irrigation systems and other engineering activities, and (3) an Agricultural Extension Group (in charge of the rice production program in the project site as well as introduction of other innovation packages into the ISA's). Actual construction of the irrigation systems will be contracted to private firms by the PTF's. The PTF is supported in each project site by the Provincial Irrigation Team (PIT) and the Municipal Irrigation Team (MIT) composed of the representatives of the local government and other national government agencies.

The PTF in each project site is supported by the Provincial Irrigation Team (PIT) and the Municipal Irrigation Team (MIT) composed of heads (or their representatives) of local and national government agencies and involved private firms. Specifically, the PIT and the MIT conduct pre-organizational training of the ISA members. The MIT also assists in the preparation of articles of incorporation and by-laws and the registration of associations with the Securities Exchange Commission (SEC). The PIT is usually composed of the following: (1) the representative of the Office of the Governor, (2) the provincial Agriculturist of the Bureau of Agricultural Extension, (3) the Provincial Irrigation Engineer of the National Irrigation Administration, (4) the Provincial Information Office of the Department of Public Information, (5) the provincial development offices of the Department of Local Government and Community Development, (6) the Provincial Engineer, (7) the Provincial Plant Pest Control Officer of the Bureau of Plant Industry, and (8) the manager or president of the electric cooperatives (representing the private sector).

The MIT is usually composed of the field technicians of the above agencies. These are the farm management technician, the municipal development officer, the water tender, a representative of the Office of the Mayor, and local leaders. The team is coordinated by the municipal mayor.

Since the above administrative system for the implementation of the project (from PTF's to the ISA's) is an adaptation from the predecessor BISA program's system, FSDC's capability for undertaking the Project can be said to have been field-tested.

4. Project Implementation

a. Implementation Plan.

(1) Loan

The following implementation schedule is within the range of reasonable expectations:

Loan Authorized (AID/W)	June 30, 1975
Loan Agreement Negotiated and signed (GOP/AID)	July 31, 1975
Conditions Precedent to opening letters of commitment met (GOP/AID)	Sept. 30, 1975
Letter of Commitment opened (GOP/AID)	Oct. 15, 1975
Request for S. L. C. (GOP)	Oct. 15, 1975
TD for disbursement request	Sept. 30, 1977

Procurement and Disbursement Procedures. The A. I. D. loan funds will be disbursed as follows:

The loan funds used to procure commodities using foreign exchange will be disbursed through standard AID Letter of Commitment and Letter of Credit procedures. The amount of direct foreign exchange from the loan is presently estimated at $1.4 million.

The remaining loan funds to be allocated for local currency credit will be disbursed as follows:

1 - GOP initially first will use its own funds to extend credit for operations;

2 - Whenever PSDC has disbursed amounts aggregating not less than ₱1,750,000 ($250,000) but no more often than once a month, it will provide documentation to AID in a form to be agreed upon.

3 - AID will open or amend a "Special Letter of Credit: in a dollar amount corresponding to the peso amount disbursed by PSDC. The Special Letter of Credit will be opened in a U.S. bank to be designated by GOP, and can be used to finance any imports from the U.S. against presentation to the bank of invoices indicating the U.S. as country of origin

and Bills of Lading evidencing shipment from a U.S. port. No other documentation is required and the usual AID procurement rules do not apply.

Since all of the commodity elements of the loan will be indented for at about the same time, it is contemplated that there will only be one letter of commitment issued for all commodities imported.

The AID grant funds will be allocated over a three-year period (FY 76, 77, and 78) and will be used for: (1) acquiring the services of selected U.S. technicians to work with FSDC, and (2) paying the costs of training for selected FSDC personnel in third countries and some in U.S.

(2) Project

An implementation plan for Stage 1 of the Project designed for April 1975 to June 1978 is in Annex L, Exhibit 1. The plan determines the schedules for the different activities of phases 1, 2, and 3 of Stage 1. Flow chart of these activities is in Annex L, Exhibit 2.

Activities for all phases are classified into the following three main aspects: (1) institutional - all activities relating to the organization, orientation and training of ISA farmers as well as communication and information endeavors; (2) technical - all activities leading to the actual setting up of the irrigation system which consist of area surveys, preparation of designs, estimates, feasibility studies, construction of power lines and physical irrigation systems structures, and water rights application; and (3) financial - all activities such as loaning, credit, marketing processes, agri-business and all other economic ventures.

The provinces to be covered by Stage 1 of the Program are divided into two sets for purposes of implementation. The first set of provinces consists of Abra, Camarines Sur, Capiz, Cavite, Ilocos Norte, Iloilo, Isabela, Laguna, Lanao del Sur, La Union, and Pampanga. The second set consists of Antique, Bataan, Cagayan, Davao del Norte, Leyte del Norte, Negros Occidental, Pangasinan, Quezon, and Sorsogon.

Preparatory activities consisting of the setting up of the program's national office and negotiations for the financial support of the national office, will be undertaken from April 1975 to October 1975.

All Phase 1 activities for the two sets of provinces have been initiated under the former BISA Program and prior to the creation of the FSDC. For Set 1 provinces Phase 1 is to be completed by June 1975; for Phase 2, by December 1975. New areas to be covered by the FSDC outside the two sets of provinces will undergo Phase 1 from mid-August 1975 to July 1976.

Implementation schedules for Set 1 provinces are:

(a) Phase 2 institutional activities: April 1975 to June 1978;

(b) Phase 2 technical activities: July 1975 to October 1975 with one activity (mobile repair support) extending to September 1976;

(c) Phase 2 financial activities: mid-January to April 1975; and

(d) Phase 3 activities: January to June 1978.

Implementation schedules for Set 2 provinces are:

(a) Phase 2 institutional activities: July 1975 to June 1978;

(b) Phase 2 technical activities: January 1975 to April 1976 with one activity (mobile repair support) extending to March 1977;

(c) Phase 2 financial activities: June 1976 to December 1976; and

(d) Phase 3 activities: July 1977 to June 1978.

Present Coverage (Under BISA Program)
1st Set of Provinces

	# ISA's	Hectarage
Abra	9	1955
Camarines Sur	18	1430
Capiz	43	3225
Cavite	3	330
Ilocos Norte	8	480
Iloilo	16	1685
Isabela	9	1426
Laguna	3	221
Lanao del Sur	15	1050
La Union	8	1240
Pampanga	7	2816
		15,908

2nd Set of Provinces

Antique	15	1319
Bataan	5	455
Cagayan	15	1270
Davao del Norte	11	1850
Leyte del Norte	16	1525
Negros Occidental	11	1495
Pangasinan	20	1260
Quezon	9	516
Sorsogon	5	451
		10,141

(3) Reporting Requirements

Reports will be required from FSDC on quarterly basis:

1 - Progress reports on the ISA's organized. Each report will indicate chronologically the number of institutional development steps completed as well as the number of technical activities completed for each ISA in the project. The report will indicate the area covered, name of the ISA, its geographic location and the expected date for inaugurating the irrigation system.

2 - Reports on the Credit Program

Each report will indicate, by geographic area and type of credit, the number and amount of credits granted during the period.

3 - Annual Reports

In addition to the quarterly reports an annual report indicating status of completion for prior and present years activities, and projected program targets for ensuing year. These reports will include detail on number of ISA's organized, number operational, area covered, locations, number of farmers served and cost details.

(4) AID Monitoring Responsibility

AID will monitor the progress of the Project closely during the disbursement period. Monitoring activities will include the following:

1 - Approval of:
   a. lending criteria
   b. technical criteria
   c. subproject selection criteria
   d. engineering design standards
   e. technical assistance types
   f. operation and maintenance plans

2 - Follow-up on FSDC administration of Program

3 - Advise FSDC and other GOP on matters pertaining to irrigated agriculture and AID financing and procurement procedures.

4 - Follow-up on fulfillment of conditions precedent.

5 - Follow-up on FSDC reporting requirements.

6 - Assist FSDC in the preparation of schedules and agenda for joint evaluation meetings and be prepared to participate in such evaluations and take any necessary action jointly agreed to.

b. FSDC Program Evaluation Design

(1) Introduction

Evaluation is considered a vital component in the administration of the FSDC Program. Evaluation results will permit key program personnel to see, at certain points in time whether program targets and goals are being met, and if not, whether the program or targets need to be changed. For cooperating agencies, evaluation results also will justify whether a program extension of additional technical or financial inputs should be supported.

All too often the evaluation function is thought to end with the grading of the program in terms of effectiveness or efficiency. Even in the most highly successful program there are bound to be weaknesses. The evaluation office, being most heavily exposed to feedback from the program is in the best position to identify operational problems, perhaps propose solutions and field-test proposed solutions prior to their incorporation into the program at large. The foregoing tasks suggest an aggressive research and evaluation program to complement the implementation of the FSDC program, and an equally strong research office to carry it out. To these, FSDC is quite responsive.

The built-in evaluation component of the FSDC program will dwell largely on a continuing refinement of program strategies and methodologies, but the ultimate concern will be to determine whether the program has reached its intended beneficiaries and whether or not the intended benefits have been realized. This internal evaluation awaits to be designed. This document will deal with the external evaluation that is necessary to check on the objectivity of the FSDC evaluation system and the fidelity in the implementation of the FSDC program.

(2) Evaluation Framework

The evaluation system is based on a logical framework matrix which has been developed to clarify the program design and to obtain a common frame of reference on the variables on which the program is going to be evaluated. The evaluation system will seek to analyze the causative linkages among the different evaluation variables classified into goal, purpose, outputs and inputs. The process of analysis follows the vertical progression of the project:

(a) If adequate inputs are provided, then planned outputs are produced.

(b) If the outputs are produced, then purpose will be achieved.

(c) If purpose is achieved, then a planned degree of progress towards a higher goal will be attained. .

(A comprehensive listing of program inputs, outputs, purpose and goal, indicators, means of verification and assumptions is attached as logical framework, Annex D.)

Assessment of Program Effectiveness. A sound criterion for evaluating the success of the program is to compare the accomplishments of the year with the year's targets. Once the problem of measuring inputs, outputs, purpose and goal have been solved, the measurement of effectiveness will be a simple matter of dividing performance over targets. The most important single measure of effectiveness is the one that is cast in terms of the program's overall goal, namely the increase in farmers' income.

For evaluation purposes, the program will be considered ineffective if it fails to achieve 65% of its targets in any given year. A target achievement of 65-75% will be considered moderately effective and upwards of 75% will be considered very effective.

Assessment of Program Efficiency. The program will be considered efficient if it realizes a benefit/cost ration of at least 1.5.

Assessment of Social Impact. While ideally, the program should not be evaluated on factors over which it does not have substantial control, FSDC will attempt to assess the impact of increased income on the social life of the farmer-beneficiaries. This attempt to assess the improvement of the quality of life of the farmer-participants of the FSDC program will utilize the set of social indicators recently developed, tested and validated by the Development Academy of the Philippines. This set of basic Philippine concerns include:

(a) Health and Nutrition
(b) Learning
(c) Income and Consumption
(d) Employment
(e) Non-Human Productive Resources

(f) Housing Utilities and the Environment
(g) Public Safety and Justice
(h) Political Values
(i) Social Mobility

A comprehensive benchmark survey will be conducted at the start of Year 1, against which measurement will be made after Year 3 and Year 5 of the program.

(3) FSDC Monitoring and Reporting System for Program Evaluation

Framework

(a) The Monitoring and Reporting System outlined below is for the purpose of collecting information for external evaluation only. It is not a complete Management Information System dealing with information gathering on all phases of the corporation's activities for purposes of management action. It addresses itself primarily to finding out when inputs are efficiently and effectively used to achieve program goals.

(b) The approach of the FSDC-MRS for Program Evaluation is adopted from the traditional black-box and the GPOI approach.

(c) Inputs into the black-box are in the form of instructions, commodities, loans, manpower, etc. The black-box is a representation of the transformation of these inputs into outputs - functional irrigation systems, post-harvest facilities, training, etc. - thru the implementation of the various program activities, of the FSDC.

(d) These outputs enable the farmers to attain purpose - increased net production, minimization of processing losses, etc.

(e) Purposes in turn will lead to the achievement of goals - increased farmer income and self-sufficiency in rice.

(f) At each step of the transformation process, inputs to outputs to purposes to goals, a monitoring and reporting system is needed to identify problems and bottlenecks. From these reports the evaluation process is carried out so that adjustments or reallocation of inputs can be effected if necessary.

System of Operations

(a) The FSDC MRS will be affecting the following organizational systems - FSDC proper, the ISA's, and USAID and other second party proponents, NEA, NIA, etc.

(b) Shown in Annex K Exhibit 4-a is a general flow of information among the different participants in the MRS. Annex K Exhibit 4-b details the forms distribution system.

(1) Information on the status of inputs and outputs will come from monthly reports of the Provincial Task Force thru the Operations Department, and the other FSDC line departments. These will be integrated and summarized by the operations control center.

(2) Information on purpose and goal achievement assessment will be collected by the Provincial Task Force from the ISA and its farmer members every cropping semester. These will be integrated by the Operations Department.

(3) The integrated reports will be submitted to the Research and Evaluation Office which will prepare a draft evaluation report for the fiscal year ended.

(4) This will be submitted to an Evaluation Committee composed of representation from FSDC, USAID, NEA, and NIA, as a basis for their evaluation report.

(c) The quality of the monitoring reports is assured thru:

(1) Adequate training of the Provincial Task Force on the reporting system.

(2) Periodic spot checking of the accuracy of the reports by the Research and Evaluation Office.

(4) Description of Reports

Inputs and Outputs

(a) Title: Work Program/Accomplishment Report on
a) Technical Activities

b) Institutional Activities
c) Financial Activities

Basic Data: Quantified planned and accomplished activities including quantified inputs needed or used for produce listed outputs - time, expenditures, manpower - per activity.

Source: Provincial Task Force - Operation Department
Engineering Department
Finance Department

Recipient: Operations Control Center

Frequency: Monthly (beginning and end of the month)

(b) Title: Summary status Report on Project Activities .

Basic Data: Integrated Work Program/Accomplishment Reports

Source: Operations Control Center

Recipient: Research and Evaluation Office

Frequency: Monthly

Purpose - Goal

(c) Title: Goal and Purpose Achievement Assessment Reports

Basic Data: Schedule of cavans of palay harvested/farm
Schedule of palay and rice price received/farm
Schedule or production returns/farm
Schedule of production costs/farm

Source: Provincial Task Force - Operations Department from ISA records and field interviews

Recipient: Research and Evaluation Office

Frequency: Every crop semester

Evaluation

(d) Title: Draft Evaluation Report

Basic Data: Logical Framework Matrix
Comparison of Target vs. Actual Accomplishments
Analysis of Variances

Source: Research and Evaluation Office

Recipient: Evaluation Team (FSDC, USAID, NEA, NIA)

Frequency: Every year

(5) The Evaluation Plan

(a) Schedule

The program will be subjected to a yearly evaluation, according to the following schedule:

FISCAL YEAR	EVALUATION PERIOD
1976	August 1976 (last two weeks)
1977	August 1977 (last two weeks)
1978	August 1978 (last two weeks)
1979	August 1979 (last two weeks)
1980	August 1980 (last two weeks)

(b) Evaluation Team

The evaluation team will be composed of the following:

1 Representative from FSDC
1 Representative from USAID
1 Representative from NIA
1 Representative from NEA

The Research and Evaluation Office of FSDC will serve as the Secretariat to the Evaluation Team.

(c) Procedure

1- After the end of each fiscal year, the FSDC Research and Evaluation Office will notify the USAID, the NEA, and NIA about the forthcoming evaluation and request these agencies to designate their representatives for the evaluation team.

2- The FSDC/REO will prepare a draft of an evaluation report based on its own field studies and on the program's service statistics during the year. Copies of these drafts will be furnished the representative from USAID, NIA and NEA during the first week of August.

3- The evaluation team will be convened in the third week of August. The team, together, will review the logical framework matrix to have a common frame of reference for the bases on which the program will be evaluated for the year under review.

4- The team will go over the reports of the FSDC/MIS to determine whether, based on reports submitted

a- Required program inputs for the year under review have been provided;

b- Targeted outputs have been realized;

c- Program purposes for the year under review have been achieved;

d- Program goals for the year under review have been attained.

5- Review the research methodology and analyses techniques that have been utilized by the FSDC/REO in the measurement of inputs and outputs, the achievement of purposes and goals and in the determination of program efficiency and effectiveness.

6- Schedule and conduct random field visitation, spot interviews with field personnel and ISA members to check on the accuracy and objectivity of submitted reports.

7- Based on its findings from the field and from the review of FSDC reports, the team will revise or finalize the draft prepared by the FSDC/REO.

8- The Research and Evaluation Office of FSDC will formalize the Evaluation report and forward copies to USAID, NIA, and NEA.

5. Conditions and Covenants

a. Conditions

The major conditions precedent (CP) required of the Borrower and/or the FSDC in addition to the standard CP's prior to any disbursement of loan funds, are recommended as follows:

(1) Written assurance from the Farm Systems Development Corporation that all irrigation systems installed or rehabilitated under this project will be undertaken only after a legal organization (Irrigators Association, Farmers Cooperative, or Samahang Nayon) has been formed and registered with SEC and their application to divert and use water for irrigation has been approved by the Philippine Government Agency having the authority to grant water rights.

(2) Written assurance from the Farm Systems Development Corporation that an operation and maintenance plan will be prepared and followed for each irrigation system installed or rehabilitated under this project. Such plan to be submitted by the ISA to the FSDC.

(3) FSDC will be required to provide AID with an implementation plan including projection of funds for contracting with A&E firms.

(4) FSDC will submit or cause to be submitted a copy of an executed contract or contracts with an engineering firm or firms satisfactory to AID to review plans and specifications, to monitor construction and issue certificates of completion.

(5) Such other conditions as AID may deem advisable.

b. Covenants

(1) The project will be implemented, on behalf of the Borrower, by FSDC.

(2) The FSDC will assure that the terms and conditions of each project implementation agreement are observed by each of the parties thereto.

(3) FSDC will assure that Project Evaluation Procedures are implemented.

(4) FSDC will assure that personnel sent for training abroad under this project will be returned to work on an AID project for a period of at least 3 times the duration of their training period abroad.

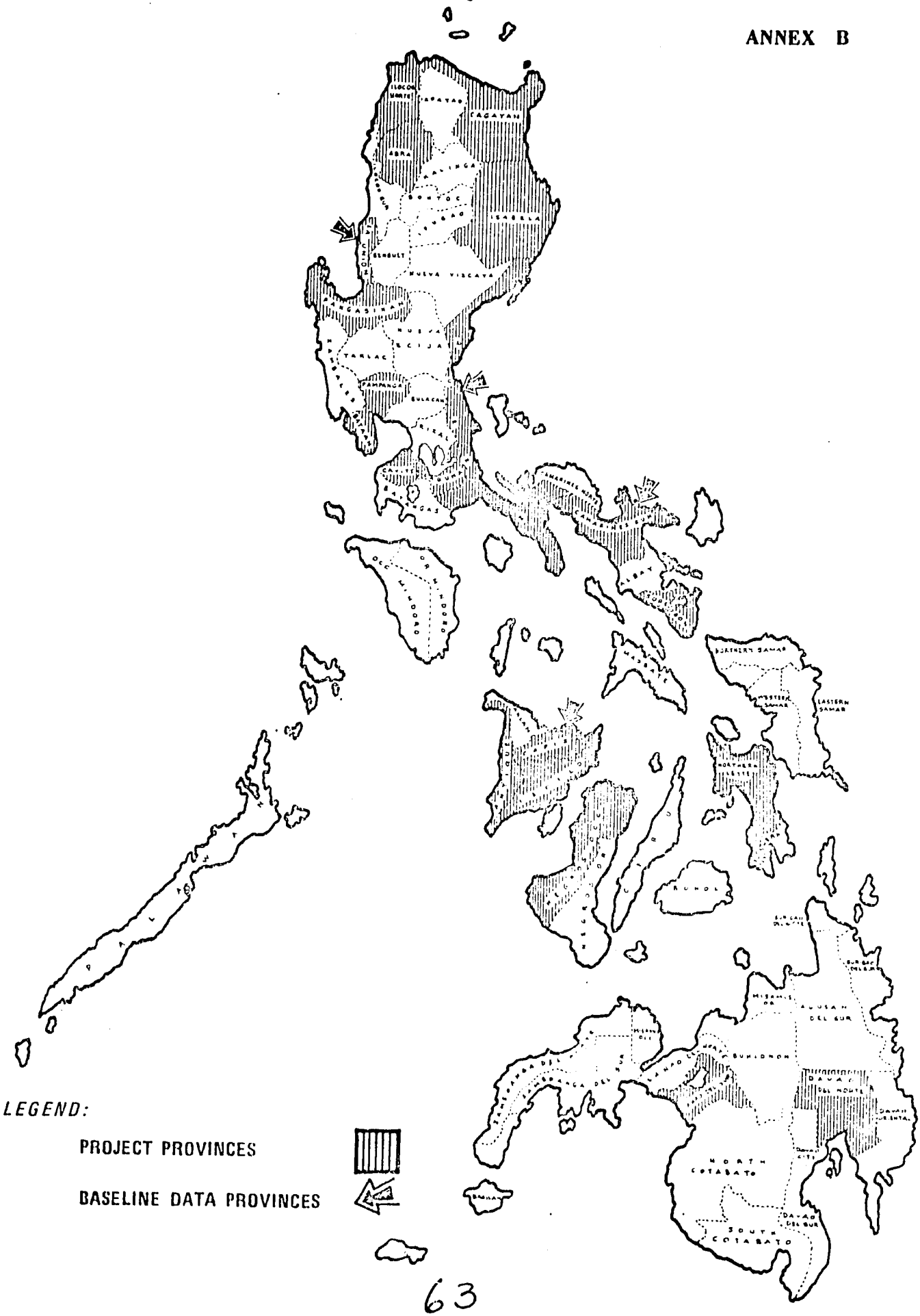
(5) FSDC will assure that strenuous efforts will be made to cause completion of basic reform actions specifically land ownership transfer of written leasehold arrangements, in all geographic areas covered by irrigation systems constructed under the AID Project. Efforts will be made to cause completion of land reform actions prior to commencement of fieldwork associated with this project in order that benefits resulting from this project effectively accrue to the actual farmer/tiller of the land. It is the intention of this project that capital investments will primarily benefit ISA farmers and others directly associated with the FSDC project.

(6) Such additional covenants as AID may deem advisable.

6. Issues

None

ANNEX B



ANNEX C

Department of State

TELEGRAM

UNCLASSIFIED 4909

PAGE 01 STATE 046439

21
ORIGIN AID-26

INFO OCT-01 EA-10 EB-07 IGA-01 L-02 /047 R

DRAFTED BY EA/CCD:TEJOHNSON:PMD
APPROVED BY A-AA/EA:GAZIMMERLY
EA/CCD:FCOLLINS,JR.
DAA/EA:[illegible] EA/TD/RD:DYEAMAN(DFT
EA/CCD:[illegible]LOVE (DRAFT)
PPC/DPRS:[illegible]DELL (DRAFT)
GC/EA:[illegible] (DRAFT)
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SER/[illegible]:J[illegible] (DRAFT)
DESIRED DISTRIBUTION
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TAGS:

SUBJECT: PRP REVIEW PROPOSED SMALL SCALE IRRIGATION LOAN (-[illegible])
REFS: (A) JOHNSON/LOVE 2-WAY DTD 1/31/75 (B) STATE 263456

1. EAPAC MET FEBRUARY 11, 1975, CONSIDERED SUBJECT PRP. PROPOSED PROJECT STRATEGY SUPPORTED BY REVIEW COMMITTEE IN THE CONTEXT OF ITS POTENTIAL REPLICABILITY WITHIN A LARGE 200,000 HECTARE AREA COUNTRY WIDE - THEREBY PROVIDING DIRECT INCOME BENEFITS TO A SUBSTANTIAL NUMBER OF RICE AND CORN FARMERS WHO WOULD OTHERWISE BE NEGLECTED UNDER CURRENT AND PROPOSED IRRIGATION PROGRAM OF THE GOP AS

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Department of State

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ASSISTED BY OTHER DONORS. THE PROJECT HAS THE POTENTIAL TO BE FULLY RESPONSIVE TO CONGRESSIONAL MANDATE IF THE SUPPLEMENTAL INFORMATION REQUESTED BELOW ON BENEFICIARIES IN FACT CONFIRMS, AS ANTICIPATED, THE LOW INCOME STATUS OF BENEFITTED FARMERS.

2. GIVEN THE SMALL SIZE OF THE PROPOSED LOAN AND THE LIMITED NUMBER OF INITIAL BENEFICIARIES COMPARED WITH THE NATION-WIDE POTENTIAL, CONCERN WAS EXPRESSED AS TO WHETHER WE COULD NOT ACCELERATE THE IMPACT OF THIS LONG NEGLECTED AREA BY A LARGER PROGRAM - PARTICULARLY IN VIEW OF THE RELATIVELY SIMPLE TECHNICAL CHARACTERISTIC OF THE INDIVIDUAL SYSTEM INVOLVED. HOWEVER BASED ON THE PRESENTATION BY USAID AND RESULTING DISCUSSIONS, WE ACCEPT USAID'S POSITION THAT A LIMITED PROGRAM IS NECESSARY DUE BOTH TO (1) THE [illegible] DIFFICULTIES WITH ORGANIZING FARMERS INTO IRRIGATORS ASSOCIATIONS IN THE PHILIPPINES AND (2) THE NEED TO DEVELOP BEYOND ITS CURRENT [illegible] A NATIONAL INSTITUTIONAL FRAMEWORK CAPABLE OF SUPPORTING THE DEVELOPMENT AND IMPLEMENTATION OF THE LARGE FOLLOW ON PROGRAM.

3. IN THE CONTEXT OF THE ABOVE, THE PRP IS CONDITIONALLY APPROVED FOR PROPOSED LOAN, SUBJECT SATISFACTORY RESOLUTION FOLLOWING TWO ISSUES:

(A) RE BENEFICIARIES, COMMITTEE FELT SOCIAL/ECONOMIC PROFILE OF PROJECTS POTENTIAL BENEFICIARIES CONTAINED PRP HIGHLY USEFUL AND INFORMATIVE. HOWEVER, OWNERSHIP VERSUS TENANCY PATTERNS AND PERCENTAGES ARE STILL TO BE DETERMINED. ALSO INFORMATION ON INCOME LEVELS IS LACKING. CONCERN IS TO WHAT EXTENT PRESENT OWNERS TRULY REPRESENT OR ARE PART OF POOR MAJORITY IN THE PHILIPPINES. PLEASE DETAIL BY FOUR PROJECT AREAS INVOLVED AND EXPLAIN HOW WE CAN BE ASSURED THAT INCREMENTAL BENEFITS WILL IN FACT ACCRUE TO TARGET BENEFICIARIES AS OPPOSED TO OTHER GROUPS;

(B) QUESTION PREVIOUSLY RAISED IN PID REVIEW AS TO WHETHER PROPOSED BISA PROJECTS WILL ESSENTIALLY INVOLVE

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[illegible] FOR [illegible] SYSTEMS OR REHABILITATION/ [illegible] EXISTING SYSTEMS IS INADEQUATELY ADDRESSED IN [illegible], IF FORMER, WILL NEED RATIONALE AS REQUESTED REF B)

4. ASSUMING ABOVE QUESTIONS CAN BE SATISFACTORILY ANSWERED, FOLLOWING ADDITIONAL ISSUES RAISED WHICH SHOULD BE ADDRESSED IN PROJECT PAPER (PP).

(A) SELECTION PROCEDURES AND CRITERIA FOR PROJECTS TO BE [illegible] BY [illegible] MAY BE [illegible] DEVELOP CHECKLIST FOR [illegible] (I.E., AVAILABILITY WATER, ELECTRIC [illegible] [illegible] STORAGE AND MILLING [illegible] ETC.) AS WAS DONE IN [illegible] (COPY BY POUCHED [illegible]).

(B) NEED TO DESCRIBE FINANCIAL ARRANGEMENTS AND FLOW OF FUNDS FROM BORROWER (GOP) TO ISAS AND ULTIMATE FARMER

[illegible] BENEFICIARIES. [illegible] DISCUSS LOAN TERMS AND REPAYMENT [illegible] [illegible] STRONGLY [illegible] POSITIVE INTEREST RATES. WHAT HAPPENS TO [illegible] PROCEEDS? HAS CONSIDERATION BEEN GIVEN TO ESTABLISHMENT REVOLVING FUNDS?

(C) WHAT ARE CONSTRAINTS IN EXISTING BANKING SYSTEM REQUIRING NEW ORGANIZATIONAL FUNDING MECHANISM?

(D) WHAT IS [illegible] ABOUT ISAS AS CONTRASTED TO [illegible] ORGANIZATIONS WHICH HAVE FAILED IN THE PHILIPPINES?

(E) MUST ISA HAVE 100 PERCENT MEMBERSHIP IN ORDER QUALIFY FOR ASSISTANCE?

(F) BELIEVE IT DESIRABLE TO HAVE AGRARIAN REFORM CERTIFICATION (BENEFICIARIES CERTIFIED TO BE LEASEHOLDERS, OWNER-OPERATORS OR AMORTIZING OWNERS) AS A CRITERION FOR PROJECT SELECTION. IS THIS FEASIBLE?

(G) LINKAGES TO OTHER ONGOING PROGRAMS SUCH AS MASAGANA

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09 SHOULD BE CLEARLY SHOWN SO AS TO MAXIMIZE BENEFITS OF IMPROVED WATER SUPPLY.

(H) QUESTION RAISED WHETHER YIELD TARGETS SHOWN AS 4.4 MT/HA MAY BE TOO HIGH IN VIEW NASACANA 09 EXPERIENCE TO DATE. IN THIS CONTEXT PROBABILITIES OF YIELD ACHIEVEMENT AND PROGRESSIVE INCREASES IN YIELD OVER TIME SHOULD BE REFLECTED IN ECONOMIC ANALYSIS.

(I) NEED A DISCUSSION OF THE IMPACT ON THE ENVIRONMENT, HEALTH AND THE ROLE OF WOMEN. DISCUSS WHETHER PROJECT DESIGN WILL PERMIT OR ENCOURAGE WOMEN TO BE INVOLVED IN DEVELOPMENT PROCESS, I.E., WILL WOMEN PARTICIPATE AND PLAY ACTIVE ROLE IN IBA OPERATIONS?

(J) GOP FINANCIAL COMMITMENT TO PROJECT AND MON MINIMUM 25 PERCENT CONTRIBUTION REQUIREMENT TO BE MET UNCLEAR FROM PRP. RECURRING PRODUCTION CREDIT FOR OTHER FARM INPUTS SUCH AS FERTILIZER AND PESTICIDES DOES NOT QUALIFY AS GOP 25 PERCENT PROJECT CONTRIBUTION AS RECOGNIZED BY FAA.

(K) IN VIEW INSTITUTIONAL DEVELOPMENT ASPECTS, LEVELS AND TYPES PROPOSED TA SHOULD BE TO ASSURE PROJECT NEEDS FULLY MET. KISSINGER

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AID 1020-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

(INSTRUCTION: THIS IS AN OPTIONAL FORM WHICH CAN BE USED AS AN AID TO ORGANIZING DATA FOR THE PAR REPORT. IT NEED NOT BE RETAINED OR SUBMITTED.)

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: (A-1)	Measures of Goal Achievement: (A-2)	(A-3)	Assumptions for achieving goal targets: (A-4)
1. To increase the income of farmers. 2. To at least double employment opportunities/labor requirements per year of participating farms. 3. To fill at least 50% (168,000 m.t.) of last year's (1974-75) rice deficit by 1977.	1. Income to be estimated from the basic equation Income=Revenue-Costs; revenues and costs for an ave. 1.5 ha. farmer owned plot to change according to the following schedule: Year / Project Status / Revenues / Costs - / before project / ₱ 2,850 / ₱ 1,295 1st / w/irrig. package / 7,950 / 3,249 2nd / w/prod. package / 10,500 / 4,139 3rd / w/mktg. package / 11,370 / 5,242 (for itemization see Economic Analysis). 2. Increased cropping from 1 to 2 times per year. 3. Reduction in importation of rice by what would have been imported without the program.	1-2 FSDC Management Information System Source: Provincial Task Force from ISA records and field interviews. Spot-checked by Research and Evaluation Department. Title: Goal and Purpose Achievement Assessment Report. Contents: Schedule of Production returns per farm. Schedule of production costs per farm. etc. (see purpose) Frequency: Every crop semester. 3. National Grains Authority Reports on production, consumption and imports/exports.	1. Palay prices will not decline with increase in supply/or GOP will maintain/increase palay support price. Costs of production inputs do not increase disproportionately from price of palay. 2. Farmers will take advantage of increased potential of their land by working for 2 croppings. 3. The GOP will not be self-sufficient in rice by 1975-76.

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AID 1020-28 (1-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Purpose: (B-1)	Conditions that will indicate purpose has been achieved. End-of-Project status. (B-2)	(B-3)	Assumptions for achieving purpose: (B-4)
1. To increase cropping from 1 to 2 times per year. 2. To increase yield/ha. from an average of 38 cav. (net of losses) to 53 cav. (net of losses) with the introduction of irrigation for 70 (net of losses) with the implementation of the production package. 3. To reduce post-harvest processing losses from 30% to 15% by the third year after ISA's are organized. 4. To increase net marketing returns from an average of ₱ 50.00 per cav. to ₱53.50/cav (at standard Feb. '75 pesos).	1. Increased cropping from 1 to 2 times per year. 2. Increased yield/ha. from 38 cav/ha. to 53 cav./ha. to 70 cav./ha. with the introduction of irrigation and production package respectively. 3. Reduced post-harvest processing losses from 30% to 15%. 4. Increased net marketing returns from an average of ₱50/cav. to ₱53.50 /cav.	1 - 4 FSDC Management Information System. Report Title: Goal and Purpose Achievement Assessment Report. Source: Provincial Task Force gathered from ISA records and field interviews. Spot checked by the Research and Evaluation Department. Contents: Schedule of cavans of palay harvested per farm. Schedule of cavans of palay processed and marketed per farm. Schedule of palay and rice prices received. etc. (see Goals) Frequency: Every crop semester.	1 - 2 Natural calamities of grave proportion do not occur. Irrigation system is functioning at 80% potential capacity. Production training given is practiced in the fields. Supplies of production inputs are available. 3. No fuel shortage prevents the normal use of post-harvest equipment. 4. Trading center prices for rice are at least 10% higher than equivalent government support price for palay.

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AID 1023-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
Institutional Activities: 1. Organized and mobilized ISA's. 2. Modern rice production techniques practiced and farm implements used. 3. Post-harvest service centers and farm equipment pools established.	Institutional Activities: 1. Organized and mobilized ISA's according to the following schedule: Year — No. of ISA's organized: Pump / Gravity / Total 75-76: 160 / 8 / 168 76-77: 240 / 16 / 256 77-78: 280 / 20 / 300 2. Modern rice production techniques practiced and farm implements used by the first cropping season of the third year after ISA was organized. 3. Post-harvest service centers and farm equipment and facilities pool established by the second cropping season of the third year after ISA was organized.	Institutional Activities: 1. Personnel records on Provincial Task Force composition, assignment, members, etc. 2-4 FSDC Management Information System Report Title: Status Report of Project Activities (Institutional) Source: Provincial Task Force; spot checked by Project Control Group Contents: Data on status of institutional activities undertaken by ISA including no. of trainees, days, budget expenditures, etc. Frequency: Monthly	Institutional Activities: 1. Pace of expansion can be supported by sufficient no. of qualified personnel for Provincial Task Force. 2. Farmer cooperation in the organization of ISA's farm management and production training given by the Provincial Task Force and other extension workers are practiced in the fields. 3. Farmers desire to operate an equipment pool and/or post-harvest service facilities.

AID 1020-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)

4. Orientation to program, seminars, workshops for PTF's completed as follows:

Year	PTF's Trained
76	88
77	136
78	160

4a. Orientation to program, seminars, workshops for ISA core groups completed as follows:

Year	No. of Farmers Trained
76	840
77	1,280
78	1,500

AID 1025-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)

5. Management skills training for 152,000 ISA members completed as follows:

Year	No. of Farmers Trained
76	16,000
77	26,660
78	32,000

6. Rice production training for ISA farmers completed as follows:

Year	No. of Farmers Trained
76	13,330
77	20,000
78	33,330

7-8. Introduction of innovation package and marketing training scheduled as follows:

Year	No. of Farmers Trained
77	6,660
78	26,660

AID 1020-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY Project Outputs: (C-1)	OBJECTIVELY VERIFIABLE INDICATORS Magnitude of Outputs: (C-2)	MEANS OF VERIFICATION (C-3)	IMPORTANT ASSUMPTIONS Assumptions for achieving outputs: (C-4)
Institutional Sub-activities: 1. Preparation of detailed program plans. 2. Recruitment of FSDC staff. 3. Training of FSDC staff. 4. Orientation and training of PTF's and ISA core groups. 5. Management skills training for ISA members. 6. Rice production training for ISA farmers. 7. Introduction of innovation package. 8. Marketing training for ISA members. 9. Program administration.	Institutional Sub-activities: 1. 50% of program target areas for five years are identified within the first year. 2. 20% of FSDC staff requirements for five years recruited within the first year. 3. Primary training and orientation given to FSDC staff according to the following schedule: Year — % Trained 76 — 50 77 — 60 78 — 70 3.a. Participants Trained Abroad: Year — Number 1975-76 — 17 1976-77 — 20 1977-78 — 10		Institutional Sub-activities: 1. No alteration in program plans after first year of operation. 2-10. Financial, manpower, equipment inputs are made available by the economy.

AID 1020-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
Technical Activities: 1. Installed an operational irrigation systems. 2. Installed an operational farm implements pool and post-harvest facilities.	Technical Activities: 1. Installed an operational irrigation systems according to the following: No. of Operational Irrigation Systems Yr. Pump Gravity Total 76 160 8 168 77 240 16 256 78 280 20 300 2. Installed an operational farm implements pool and post-harvest facilities according to the following schedule: No. of ISA's Provided with Facilities Yr. Pump Gravity Total 77 80 8 88 78 240 8 248	Technical Activities: 1-2. FSDC Management Information System. Report Title: Status Report on Project Activities (Technical). Source: Provincial Task Force; spot-checked by Project Control Group. Contents: Data on status of technical activities/ICA including time-budget estimates. Frequency: Monthly	Technical Activities: 1. Pumps and accessories are available and delivered as scheduled. 2. Costs of equipment have not risen considerably or commercial processors have not reduced processing costs sufficiently to make ISA post-harvest facilities operation uneconomical. Size of ISA's can support the minimum economic scale of operating post-harvest facilities.

AID 1022-28 (11-73)
SUPPLEMENT 1

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared: _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Outputs: (C-1)	Magnitude of Outputs: (C-2)	(C-3)	Assumptions for achieving outputs: (C-4)
Financial Activities: 1. Loans for irrigation system, farm implements and post-harvest facilities granted. 2. Repayments on loans granted do not exceed a delinquency rate of 20% (accounts overdue for 6 months or more).	**Financial Activities:** 1. Loans for irrigation system, farm implements and post-harvest facilities granted according to the following schedule: Loans Granted (₱ Mil.) Yr. / Irrig. Sys. P / Irrig. Sys. G / Farm Sup. System P / Farm Sup. System G 76 — 16 — 12 — - — - 77 — 24 — 24 — 7 — - 78 — 28 — 30 — 21 — 7	**Financial Activities:** 1. FSDC Management Information Systems. Report Title: Status Report on Project Activities (Financial). Source: Finance Department from loan contracts and repayment receipts. Contents: Data on Status of Financial Activities/ISA including loans granted, loan terms, repayment promptness, etc. Frequency: Monthly Total 28 55 86	**Financial Activities:** 1. Funds are released by GOP and funding agencies as scheduled. 2. Force majures which may impede debt servicing capacity of ISA's do not occur.

AID 1020-2A (1-77)
SUPPLEMENT I

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY _____ to FY _____
Total U.S. Funding _____
Date Prepared _____

Project Title & Number: Small Scale Irrigation

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS			MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Project Inputs (D-1)	Implementation Target (Type and Quantity) (D-2)			(D-3)	Assumptions for achieving inputs (D-4)
	76	77	78		
AID				AID Personnel Records.	Funds and qualified personnel available and timely recruited.
Tech Assistance (Grant)	$ 200,000	$ 300,000	$ 100,000	AID Training Office	Funds and qualified candidates
Training (Grant)	105,000	40,000	25,000	Records.	available.
Commodities (DL)	1,400,000	-	-		
Credit ($ Equivalent Local Currency (DL)).	1,400,000	2,500,000	1,200,000	AID DL Records.	
GOP					Budget available.
Program Admin. (Pesos)	4,900,000	5,600,000	6,300,000		
A/E Monitors	700,000	700,000	700,000		Budget and qualified contract firms available.
Credit	11,200,000	14,000,000	24,500,000		Budget available and released to financing institutions.

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ANNEX E

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

CERTIFICATION PURSUANT TO SECTION 611(e)
OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, THOMAS C. NIBLOCK, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of projects in the Philippines previously financed or assisted by the United States, do hereby certify that, in my judgment, the Philippines has both the financial capability and the human resources capability to effectively maintain and utilize the proposed Small Scale Irrigation Loan.

This judgment is based upon the project analysis as detailed in Philippines Small Scale Irrigation Project Paper and is subject to the conditions imposed therein.

Thomas C. Niblock, Director
USAID/Philippines

May 3, 1985
Date

CAPITAL ASSISTANCE LOAN AND GRANT AUTHORIZATION

Provided from: Food and Nutrition
(Philippines: Small Scale Irrigation Loan)

Pursuant to the authority vested in me as Assistant Administrator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the National Economic Development Authority of not to exceed Six Million Five Hundred Thousand Dollars ($6,500,000) and a Grant not to exceed Five Hundred Thousand Dollars ($500,000).

The Grant proceeds will be used to finance technical assistance and participant training supportive to the loan funded program. The proceeds of this loan will be used to increase food supplies through development of improved production on the small farms. This will be accomplished by financing the foreign exchange component of imported construction and farm equipment commodities and for reimbursing the Borrower fifty percent of the peso costs for farm systems habilitation of small organized groups of rice farmers called Irrigators Service Associations for procuring and installing irrigation pumping sets, constructing irrigation water distribution facilities, and for acquiring improved production and marketing implements and facilities. The loan will finance between 35 and 40 percent of the total project costs for installing new irrigation facilities on 10,000 hectares and rehabilitation of 30,000 hectares of previously built irrigation systems in 20 provinces of the Philippines. The loan shall be subject to the following terms:

1. Interest Rate and Terms of Repayments

The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbrusement under the loan, including a grace period of not to exceed ten (10) years. The interest on the unrepaid principal balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in the Philippines or in countries included in A.I.D. Geographic Code 941 (Selected Free World).

(b) The loan agreement shall provide that prior to the disbursement of loan proceeds, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.

(1) A project implementation plan for the life of the project prepared by FSDC, including a projection of funds available to finance the various elements of the project.

(2) Written assurance from the Borrower that sufficient funds will be made available to FSDC pursuant to (1) above in order to assure timely and orderly implementation of the project.

(3) A copy of an executed contract or contracts with a local engineering firm or firms to review plans and specifications and to monitor construction satisfactory to A.I.D.

(4) Written assurance from the FSDC that all irrigation systems installed or rehabilitated under this project will be undertaken only after a legal organization has been formed and registered with SEC and their application to divert and use water for irrigation has been approved by the Philippine Government Agency having the authority to grant water rights.

(5) Written assurance from the FSDC that an operation and maintenance plan will be prepared and followed for each irrigation system installed or rehabilitated under this project. Such plan to be submitted by the ISA to the FSDC.

(c) The loan agreement shall contain the following special covenants by the Borrower:

(1) The Project will be implemented, on behalf of the Borrower, by FSDC.

(2) The FSDC will assure that the terms and conditions of each project implementation agreement are observed by each of the parties thereto.

(3) FSDC will assure that Project Evaluation Procedures are implemented.

(4) Such additional covenants as A.I.D. may deem advisable.

(d) The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

_____

Arthur Gardiner
Assistant Administrator for East Asia
AID/Washington

_____

Date

CAPITAL ASSISTANCE LOAN AND GRANT AUTHORIZATION

Provided from: Food and Nutrition
(Philippines: Small Scale Irrigation Loan)

Pursuant to the authority vested in me as Assistant Administrator, Agency for International Development ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the National Economic Development Authority of not to exceed Six Million Five Hundred Thousand Dollars ($6,500,000) and a Grant not to exceed Five Hundred Thousand Dollars ($500,000).

The Grant proceeds will be used to finance technical assistance and participant training supportive to the loan funded program. The proceeds of this loan will be used to increase food supplies through development of improved production on the small farms. This will be accomplished by financing the foreign exchange component of imported construction and farm equipment commodities and for reimbursing the Borrower fifty percent of the peso costs for farm systems habilitation of small organized groups of rice farmers called Irrigators Service Associations for procuring and installing irrigation pumping sets, constructing irrigation water distribution facilities, and for acquiring improved production and marketing implements and facilities. The loan will finance between 35 and 40 percent of the total project costs for installing new irrigation facilities on 10,000 hectares and rehabilitation of 30,000 hectares of previously built irrigation systems in 20 provinces of the Philippines. The loan shall be subject to the following terms:

1. Interest Rate and Terms of Repayments

   The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbursement under the loan, including a grace period of not to exceed ten (10) years. The interest on the unrepaid principal balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in the Philippines or in countries included in A.I.D. Geographic Code 941 (Selected Free World).

(b) The loan agreement shall provide that prior to the disbursement of loan proceeds, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.

(1) A project implementation plan for the life of the project prepared by FSDC, including a projection of funds available to finance the various elements of the project.

(2) Written assurance from the Borrower that sufficient funds will be made available to FSDC pursuant to (1) above in order to assure timely and orderly implementation of the project.

(3) A copy of an executed contract or contracts with a local engineering firm or firms to review plans and specifications and to monitor construction satisfactory to A.I.D.

(4) Written assurance from the FSDC that all irrigation systems installed or rehabilitated under this project will be undertaken only after a legal organization has been formed and registered with SEC and their application to divert and use water for irrigation has been approved by the Philippine Government Agency having the authority to grant water rights.

(5) Written assurance from the FSDC that an operation and maintenance plan will be prepared and followed for each irrigation system installed or rehabilitated under this project. Such plan to be submitted by the ISA to the FSDC.

(c) The loan agreement shall contain the following special covenants by the Borrower:

(1) The Project will be implemented, on behalf of the Borrower, by FSDC.

(2) The FSDC will assure that the terms and conditions of each project implementation agreement are observed by each of the parties thereto.

(3) FSDC will assure that Project Evaluation Procedures are implemented.

(4) Such additional covenants as A.I.D. may deem advisable.

(d) The loan agreement shall include such other terms and conditions as A.I.D. may deem advisable.

_____
Arthur Gardiner
Assistant Administrator for East Asia
AID/Washington

_____
Date

ENVIRONMENTAL ANALYSIS

In accordance with MC 1214.1 the following analysis of environmental impact is submitted:

Part I - Description of Project

The Small Scale Irrigation Project for which this analysis is prepared is one of a series of agricultural development projects being undertaken by the Government of the Philippines (GOP). Briefly, the project aims to increase the agricultural production and income of small scale rice farmers with average landholding of 1.5 hectares (3.75 acres). The basic approach to achieving objectives is through organization and strengthening of farmers cooperatives called Irrigators Service Associations. With help and guidance from GOP the Associations (each comprised of 30-70 small scale farmers) build, operate, and manage their own small irrigation systems averaging in size less than 100 hectares (250 acres). They also plan and implement agricultural production and marketing services projects designed to redirect or otherwise retain a larger share of the food production, processing/marketing chain profits back to their own rural community base.

The AID loan will be used to finance: (1) a line of credit to the associations for purchasing and installing irrigation pumping sets for 10,000 hectares of rice producing land. The area is comprised of about 100 separate and scattered subproject areas of the Philippines. (2) credit to older associations for rehabilitation of previously installed pump irrigation systems in approximately 300 project areas comprising 30,000 hectares, (3) credit to associations for purchasing group owned mechanization facilities, implements and tools for modernizing production and crop handling processes, and (4) foreign exchange for acquiring essential commodities to assist in establishment and consolidation of the New Farm Systems Development Corporation (FSDC) which is charged with responsibility for implementing the project.

A profile of the individual projects to be financed shows them to be; (1) small in size, (2) relatively inexpensive, (3) uncomplicated in design and installation requirements, (4) easy and quick to install, (5) high internal rate of return and benefit/cost ratio, (6) able to yield quick production impact, and (7) highly popular with the farmers.

The implementing agency is a new organization specially created and tailored to carry out small scale irrigation and attendant agricultural development activities. Policy formation and programming

at the National level is responsive to local desires expre ed through provincial and municipal levels where all activities are concentrated.

The project coverage presently extends to 20 provinces but will extend to additional provinces as more capability for implementation and financial resources for credit are built up. By 1980 it is intended that development of small scale irrigation systems will encompass over 50,000 hectares per year.

The primary implementors are the Provincial irrigation teams who organize the farmers into irrigators associations. The associations are chartered, by-laws and articles of incorporation are adopted and the association is registered with the Securities Exchange Commission as a non-stock, non-profit association. Water rights are applied for and when approved the association applies for loan funds for installing irrigation systems according to design requirements of the FSDC engineers. The loans are mostly collective guaranty 5-year term loans. The association members elect the Financial Management, Irrigation Management, Education and Training, Audit and Inventory, and the Grievance Committees. A progressive stage continuing training program is established which draws on specialist talent from both provincial and national agency sources. The overall program design incorporates an evaluation system through which FSDC monitors the projects for determining the indicators in the time stream of events when the associations are ready for federation at the provincial or regional level. The third level of institutionalization combines the provincial federations into a National Apex organizational framework which eventually will broaden its scope to provide all technical and financial assistance to organization members and otherwise become a self-sustaining farmer owned agency. The AID loan described in the accompanying project paper supports the program only through the first level, i.e. the individual irrigators service associations and provisions of credit for establishing irrigation systems, and production and marketing facilities.

Part II - Environmental Impact

A. Environmental/Resource Linkages

These small projects 50 to 100 hectares in size affecting 30 to 70 farm families each are not foreseen as causative to significant shifts in population density or dispersion within the rural communities. The projects when installed offer the potential to re-regulate to a certain extent patterns of movement about the local area. Water conveyances consisting of laterals, farm ditches and farm drains will have specified

crossing points for both animal and machine drawn implements. The local farmers irrigators association can effect certain environmental improvements under the aegis of the project by draining off low lying areas, effecting stringent weed and other undesirable plant control measures, and by generally policing the water distribution and drainage system in a good husbandlike manner.

The pumping station is normally established at a site which has ready access and is housed in a small building. The pumping station and building because of their small size do not cause serious erosion, land clearing or soil stripping of significant scale, nor do they adversely alter the existing landscape significantly.

The irrigation systems are installed in rice lands where traditionally one crop per year of rice is grown during wet season so that the ecosystem is already established and only the effects of an additional rice crop each year together with improved farming methods can be considered as affecting. The major components of the ecosystem being those found in low lying plains may be affected by increased population of land crabs, rice quail, rodents, etc. It is not expected that new or exotic biological species will be introduced as a result of the project, nor will these small pumps diverting water from the numerous streams have important deleterious effects on existing biota in the water system of the areas. There will be little or no disruptive effect on migratory wildlife, at least none is foreseen.

B. Construction and Operations

Protective considerations enter into the design of all sub-projects. Pumping stations are protected in buildings where electric controls are protected from wind, water, rodents, and children. The foot valves of the pumps are protected with screens designed to keep all floating debris, fish, and other water borne materials from going through the pump impellers. Extensive borrow or fill involving soil movement is not a major component of project works. Small ditches are excavated by hand labor and the excavated material is used in building up and reinforcing the banks of the channels to prevent overflows. Diversion and water control structures built into the channel similarly do not involve major excavation or embankment works.

As the project areas cover only the fields or producing areas outside the barrios or village proper the effect on drinking water is expected to be minimal. Certainly there will be some effect on ground-water conditions but a good drainage plan tends to mitigate any deleterious

effects. Problems related to erosion and salinity in the project areas are not foreseen. The areas are flat and natural rainfall is sufficient to forestall problem development in salinity and erosion.

C. Health Impact

The evaluation and monitoring plan for the AID project has built in requirements for measuring health impact along with other indicators of changes in rural life quality as a result of the project. The monitoring plan is based on continuing periodic inspection, reporting and analysis. The Philippine Department of Public Health has an active program for monitoring, controlling, and preventing the spread of endemic diseases. The projects monitoring and annual evaluation program can serve as an important additional resource to their program.

D. Long Term Considerations

The project offers potential for stabilizing rural life. Sharply increased production at home can have a dampening effect on out migration to the already overcrowded large cities. With more income, better health care and educational facilities can be afforded, improved and more nutritious diet will provide a better life for rural dwellers. A more development oriented atmosphere may induce enthusiasm for entrepreneurial undertakings in farming supper service in the rural community thereby retaining a larger share of monetized production benefits at home.

Part III - Adverse Considerations

A. Salt Water Intrusion

In two specific areas of the Philippines where elevations above sea level are low and where tidal effects extend considerable distance upstream extreme care will be necessary to control salt water intrusion. These two areas are the lower reaches of the Bicol River in Southern Luzon and the Pampanga River in Central Luzon. The situation exists, it is identified and is being monitored by the Bureau of Public Works and National Irrigation Administration. Systems in these areas will have to be designed with capacity to supply sufficient water during low tide periods so that saline water will not be diverted to the land. Additionally, flap gate controls may be needed on some of the drainage facilities in these low lying areas. A continuous monitoring program will be necessary.

B. Public Health

Bilharziasis, a parasitic disease also known as Schistosomiasis is a major public health problem in two discrete areas of the Philippines, Leyte and Eastern Mindanao. Although the AID project will not be implemented specifically in these areas some project activities will be carried out in areas adjacent to the affected area in Mindanao. Since this is a water borne disease, as aquatic and amphibious snails serve as intermediate hosts, development of irrigation projects signals a need for special considerations. All subprojects planned in Davao del Norte, the area in Mindanao adjacent to that islands area of endemicity will be subjected to a special Health Impact Study concurrently with other project investigations prior to final approval of the project. The Department of Public Health will make the surveillance of the area on periodic basis to determine whether the disease has been introduced and to provide safeguards against possible spread of Schistosomiasis.

Generally, the FSDC development program is pursued within a system approach to provide services to the ISA members. Health and sanitation studies are conducted in all FSDC projects to guard against the outbreak of diseases associated with the construction of new irrigation systems and introduction of modern cultivation practices. In view of this, a checklist is issued to all ISA members to evaluate the environmental consequences on the project, if any, and to determine those cases that would need intensive investigation in assessing the environmental impact on the habitat.

A sample checklist is attached. It is envisioned that as the project development continues with the strengthening of the farmers organization, some modification of the checklist may be necessary. This is to insure that a surveillance program is established. The Provincial Management Staff is coordinating with the local office of the Department of Health to conduct Health Impact Study on irrigation systems.

Part IV - Alternatives

The alternative to building 100 new and rehabilitating 300 previously built small scale (100 hectares) irrigation systems in scattered areas may be to invest only in large systems. Considering only the environmental impact of the two approaches the Small Scale Irrigation Project is by far the most feasible. Individual subprojects being small in size do not by themselves cause population dislocations. They don't

appreciably alter streamflows or back up major water bodies which in time fill with silt. No major structures are involved with their attendant marring of natural landscapes. They are small enough that small groups of farmers can manage and operate them. They are quick to install, relatively cheap, and provide a basis for realizing immediate benefits. Their scattered dispersion forces attention from both public and private agencies to the problems of more isolated and disadvantaged rural communities.

ENVIRONMENTAL ASSESSMENT CHECKLIST

Project No.:_____

Project Location:_____

1. Is irrigation system compatible with long-range development of area?
   yes /__/ no/__/ no long range development plan made /__/
2. New area /__/ or previously rain-dependent cultivated area/__/
3. If new area, is the area dry /__/ moist /__/ swampy /__/
   forest /__/ or grassland /__/ ?
4. Will project involve draining swampland? yes /__/ no /__/
   If yes, what wetland resources will be affected? _____
   _____
5. Will construction of the diversion disrupt fishing or fish migration in the river? yes /__/ no /__/ unknown /__/
   If yes, to what extent? _____.
6. Will diversion of water for irrigation restrict or preclude present downstream use of water? yes /__/ no /__/ unknown /__/
   If yes, list water uses and users affected: _____
   _____
7. Are anticipated sediment levels from irrigation water source expected to give canal maintenance problems? yes /__/no /__/ unknown /__/
8. Location of nearest health clinic: name_____ kms._____

9. Have discussions with local health officials revealed any special health problems in the area? yes /__/ no /__/ unknown /__/

If yes, list: _____ _____ _____

10. Approximate malaria incidence in the area: <1% /__/; 1-5% /__/; 5-10 /__/; >10% /__/

11. Approx. falariasis incidence in area: 0 /__/; <1% /__/; 1-5% /__/; >5% /__/

12. Approx. schistosomiasis incidence in area: 0 /__/; < 1% /__/; 1-5% /__/; > 5% /__/.

13. Proximity of village to proposed irrigated area: kms _____

Village on higher ground /__/ or same level ground /__/

14. Source of drinking water for village: independent source /__/ or expected to be taken from irrigation canals /__/

If independent source: wells /__/; spring /__/; river /__/ above diversion /__/ or below diversion /__/

15. Washing, bathing and excreta disposal facilities for village: independent facilities /__/ or expected use of irrigation canals /__/

16. Will use of fertilizers, pesticides, fungicides, rodenticides, etc., be introduced and used in the irrigated area? yes /__/ no /__/ unknown /__/

If yes, briefly outline chemicals to be used, method of application and safety precautions planned for storage, handling and application

_____

_____

ECONOMIC BENEFITS - BASIC DATA

ANNEX H
Exhibit 1

Schedule of Production Increases per Annum 1a

	Total Production (m.t.)	Value of Production (₱) million	$ Millior
Without the project	60,800	60.8	3.7
With Irrigation System	169,600	169.6	24.2
With Production Package	224,000	224.	32

Assumptions: 1b

1. Total coverage = 32,000 hectares
2. Increase due to irrigation: 38 cavans (1.9 m.t.) per hectare for 1 cropping season to 53 cavans (2.65 m.t.) for each of 2 cropping seasons.
3. Increases due to Production package: 53 (1.9 m.t.) per hectare to 70 cavans (3.5 m.t.) per crop.
4. Value of production based on a conservation farm price ₱50 per cavan or $143 per metric ton of rough rice. The current CIF price of imported rice is $400 per metric ton.

ANNEX H
Exhibit 1-c

Schedule of Farm Income Increase (1.5 has.)

	Before Project	Irrigation	Irrigation and Production Package	Irrigation Production Package and Marketing Package
REVENUES	₱ 2,850	₱ 7,950	₱ 10,500	₱ 11,970
COSTS (out of pocket)				
Labor and Machine				
Land Preparation	120	240	480	480
Harvesting	₱ 112.5	300	375	375
Threshing	272.	660		
Drying				
Milling				336
Storing				105
Transportation				543
Materials				
Seeds	90	180	270	270
Fertilizers	510	1020	1740	1740
Insecticides	48	96	906	906
Herbicides	48	96	195	195
Sacks	76	152	210	210
Irrigation Fees		1050	1050	1050
Interest on Inputs	138.78	455	443	562
Total	1,295.	4,249	4,139	5,242
NET INCOME	₱ 1,555	₱ 3,701	₱ 6,361	₱ 6,728

Assumptions:

1. Based on typical 1.5 hectare farm
2. Yields will increase from 38 per hectare to 106 per hectare to 140 per hectare per year for succeeding 'package'.
3. Farm gate price = ₱50 per cavan of palay
4. Trading center price = ₱95 per cavan of rice
5. .6 cavan of rice of every cavan of palay.
6. Harvesting will increase from 15 man days to 20 man days, to 50 man days, and are assumed out - of - pocket costs
   Rate is at ₱5.00 per man day
7. Commercial threshing fee estimated at ₱4.15 per cavan
8. Recommended storing fee is ₱.50 per cavan and milling costs are covered by sale of by-products
9. Transportation charge: to transport rice to trading center, jeepney hired at ₱200 per day, loaded with 30 sacks, making 2 trips
10. Seeds, fertilizers, herbicides, and sacks . See Production costs estimates Annex 4
11. Irrigation fees are 7 cavans per hectare cropping season
12. Interest on inputs are at 12% of all out - of - pocket costs.

ANNEX H
Exhibit 1-e

Calculation of Employment Effects:

	Activity	Labor Requirement per hectare (in man days) Without Project	With Project (full-development)
1.	Land preparation	10	40
2.	Seed bed preparation	1	3
3.	Transplanting	15	30
4.	Weeding	15	12
5.	Spraying	2	16
6.	Fertilization	.5	2
7.	Harvesting	15	50
		58.5	153

Increase in labor requirements per hectare 94.5 man days

Increase in labor requirements for 32,000 hectares 3,024,000 man days

+300 days per annum

Increase in employment per annum 10,080 men

Economic Rate of Return Analysis

Procedure:

The economic rate of returns were estimated by evaluating costs and benefits 'with' and 'without' the project and costs and benefits with and without each of the project components.

To derive the B/C ratio:

$$\frac{\text{Benefits}}{\text{Costs}} = \frac{\text{Present value of incremental Production benefits - present value of incremental Production costs}}{\text{Present value of Incremental Operations/Maintenance and Program Costs (at a 14\% rate of discount)}}$$

To derive the IRR:

Compute for the rate of discount that will equate -

IRR Net Benefit = Incremental Production Benefits - (Incremental Production Costs and Incremental Operations/Maintenance and Program Cost) to zero.

The computations are based on the figures below.

1. COSTS (other than Production Costs)

1-f-i

A. IRRIGATION

1. Construction and Equipment -

(see attached summary of construction costs)

2. Operations and Maintenance -

(see attached summary of operations and maintenance costs)

3. Program Management

	₱ / HA.			
YR.	1	2	3	4-10
Training	21	39		
Project Supervision	17	11	8	8
Administration	14	15		
Field Engineers Survey		20	20	

Source: BISA Budget

B. Production Package:

1. Construction and Equipment (for a 100 hectare ISA)

	Item	Specifications	Unit Cost	Qty	Total
a)	Sprayer		₱		₱ 4,000
b)	Weeder				4,500
c)	Thresher	4 hp. (5.8 ca./hr.)	5,000	3	15,000
d)	Dryer	7 hp. (45 cav./hr.)	6,000	1	6,000
e)	Eng. and Const. and working capital (5% of above)				1,475
	Total for 100 hectare ISA				₱30,975
	Cost per Hectare				= 310

Source: NGA National Grain Center Project and Cavans Reports.

2. Operations and Maintenance (for a 100 hectare ISA)

		Operating Time	Labor Rate	
a)	Wages			
	Thresher	2,400 hrs.	₱2.50/hr.*	₱ 6,000
	Dryer	300 hrs.	₱2.50/hr.	750
	Total Wages			₱ 6,750

* 1 operator and 1 helper

b)	Depreciation (10 yrs)	
	Thresher	₱ 1,500
	Dryer	1,200
	Sprayer	400
	Weeders	450
		₱ 4,567

c) **Fuel and Oil Consumption**

	Operating Time	Fuel. Cons. Rate	Fuel Cons.	Cost/ liter	Fuel Cost	Lubricating Oil	Total	
Thresher	2400	.255/bhp hr.	2,448 lit.	₱1.10	₱2,693	₱160	2853	
Dryer	300	11	535 lit.	.80	428	36	564	
Total								3,317

d) Repairs (5%) 1,475

e) Administrative Expenses

Salary	4,200
Others	500
TOTAL FOR A 100 Hectare ISA	₱ 20,809
Cost/hectare	208

Source: NGA National Grains Center Project

3. Program Management

	Per Hectare (₱)			
YEAR	1	2	3	4-10
Training		39		
Project Supervision		6	6	2
Administration		8	8	

Source: BISA Budget

C. MARKETING PACKAGE

1) Construction and Equipment Cost

Item	Specifications	Cost
a) Rice Mill	12 hp., 5.8 cav./hr.	₱ 15,000
b) Warehouse	10 m. x 7 m. x 5 m. 1,000 cav. capacity	25,000
c) Scales		2,000
d) Eng. Construction Cost		2,450
Total for a 100 hectare ISA		₱ 51,450
Cost/hectare		515

Source: NGA National Grains Center Project and Canvas Reports

2) Operations and Maintenance (for a 100-hectare ISA)

a) Wages	Operating Time	Rate	
Mill	2,400	₱3.50*	₱ 8,400

*1 operator and 2 helpers

b) Depreciation

Mill (10 yrs.)	1,500	
Warehouse (25 yrs.)	1,000	
Total		2,500

c) Repairs

Mill (5%)	750	
Warehouse (2%)	500	,250

d) Administrative Expenses ,800

e) Fuel and Oil Consumption (mill)

Operating Time	Fuel Consumption rate	Fuel Consump.	Diesel Cost/liter	Fuel Cost	Oil	
2,400	.255 liters/ bhp. hr.	7,344	₱1.00	₱ 7,344	₱272	7,616
TOTAL FOR A 100 Hectare ISA						₱21,566
COST/HECTARE						216

Source: NGA National Trains Center and Canvas Reports

3) Program Management

₱/Ha.

YEAR	1	2	3	4	5
Training			10		
Project Supervision			3	3	1
Administration			4	4	

Source: BISA Budget

D. PRODUCTION COSTS/HA.

ITEM	Without Project	With Irrigation	With Irrigation and production package	With Irrigation and marketing package
Labor and Machines				
a) Land preparation	₱ 80	₱ 160	₱ 320	₱ 320
b) Seed-bed preparation	6.50	13	18	18
c) Transplanting	75	150	150	150
d) Weeding	75	150	60	60
e) Spraying	10	20	80	80
f) Fertilization	2.50	5	10	10
g) Harvesting	75	200	250	250
h) Threshing	160	440		
i) Drying	30	85		
j) Milling				
k) Storing				
l) Transportation				
	₱ 514	₱1,223	₱ 888	₱ 1,250
Materials				
a) Seeds	₱ 60	₱ 120	₱ 180	₱ 180
b) Fertilizers	340	680	1,160	1,160
c) Insecticides	32	64	604	604
d) Herbicides	32	64	130	190
e) Sacks	76	106	140	140
	₱ 540	₱1,034	₱ 2,214	₱ 2,214
Interest on Production Inputs	₱ 126	₱ 271	₱ 372	₱ 416
Opportunity cost of land				
Total cost	₱1,180	₱2,597	₱ 3,543	₱ 3,949

Assumptions

Labor and Machine				
a) Land preparation	10 m.d.[1] / 10 a.d.[2]	20 m.d. / 20 a.d.	40 m.d. / 40 m.d.	40 m.d. / 40 m.d.
b) Seed bed preparation	1 m.d. / .5 a.d.	2 m.d. / 1 a.d.	3 m.d. / 1 a.d.	3 m.d. / 1 a.d.
c) Transplanting	15 m.d.	30 m.d.	30 m.d.	30 m.d.
d) Weeding	15 m.d.	30 m.d.	12 m.d.	12 m.d.
e) Spraying	2 m.d.	4 m.d.	16 m.d.	16 m.d.
f) Fertilization	.5 m.d.	.5 m.d.	2 m.d.	2 m.d.
g) Harvesting	15 m.d.	20 m.d.	50 m.d.	50 m.d.
h) Threshing	₱4.15/cav.[3]	₱4.15/cav.	₱1.20/cav.[4]	₱1.20/cav.
i) Drying	6 m.d.	17 m.d.	.60/cav.[5]	.60/cav.
j) Milling				₱1.65/cav.[6]
k) Storing				₱ .50/cav.[7]
l) Transportation				₱3.35/cav.[8]

1) ₱5.00 per man-day

2) ₱3.00 per animal-day

3) Commercial threshing rate

4) - 7) Based on NGA, National Grains Center Project

8) Assuming a jeepney is hired at ₱200 per day, loaded with 30 sacks and making 2 trips to trading center

Materials:	(1)	(2)	(3)	(4)
a) Seeds	₱ 60	1 x 2	certified seeds ₱ 90 x 2	same as (3)
b) Fertilizers	2 bags of urea at ₱150 @	1 x 2	3 bags of 16-20 x 2 at ₱ 80 @	same as (3)
c) Insecticides	1 liter folidol ₱ 30	1 x 2	Faradan- 1 bag x 2 at ₱ 90 @ Gama BHC, 32 kg. at ₱ 4 @ x 2 Folidol, liter at ₱ 32 @ x 2	Same as (3)

	(1)	(2)	(3)	(4)
d) Herbicides	2-4-D EC, 1 liter at ₱ 32 @	1 x 2	2-4-D PEG 25 kg. at ₱ 65@	same as (3)
e) Sacks	₱ 2/bag x ₱38	1 x 2	₱ 2/bag x 140	same as (3)

Interest (Opportunity cost) 12% of total labor and material inputs

Opportunity cost of Land.

Based on dry season cropping potential of .6 of normal yield, and .8 land utilization. Cost of production is assumed .6 of normal costs.

3. Annual Benefits per hectare is based on the following:

	Without Project	With Irrigation	With Irrigation and Prod. Package	With Irrigation Prod and Mktg. Package
Yield per hectare (cav.)	38	106	140	140 (84-rice)
Unit cost/cavan (₱)	50	50	50	95 (rice)
Gross Benefits (₱)				
Production	1,900	5,300	7,000	7,980
By-product				336
Production cost/ha. (₱)	1,180	2,597	3,543	3,949
Total incremental gross benefits		3,400	1,700	1,316
Total incremental production cost	-	1,417	946	406
Net Benefits	720	2,703	3,457	4,367
Net Incremental Benefits	-	1,983	754	910

INTERNAL RATE OF RETURN CALCULATIONS

CAMARINES SUR

A. PROFILE OF THE PROVINCE

Located in the heart of the Bicol Peninsula, Camarines Sur is hilly and mountainous province which levels off to an extensive plain across the central part of the province. It forms a common boundary with Camarines Norte on the nortl. and with Albay and Ragay Gulf on the south. Facing Lagonoy Gulf on the east, it is bounded by Quezon province and Ragay Gulf on the west. The area surrounding Mt. Isarog and Mt. Iriga is extremely rough but suitable for abaca plantations.

With a land area of 5266.8 square kilometers, it embraces thirty-five municipalities and two cities.

The climate prevailing in the eastern and northern parts of the province is characterized by a definite absence of a dry season and a very pronounced maximum rain period from November to January.

The province is predominantly rural. The major agricultural crops grown in the area are palay, coconut, abaca, and corn. Some of the minor crops are fruits and nuts, citrus, rootcrops, vegetables, onions, beans and peas, coffee, cacao and peanuts.

Camarines Sur has a total household population of 947,367 of which 78% of the labor force are employed in agriculture. Most of these households around 72% receive an annual income of ₱3,000 or less or equivalent to $428.52.

B. BARRIO IRRIGATORS' SERVICE ASSOCIATIONS (BISA PROGRAM)

The present scope of the BISA Program in the province of Camarines Sur in the Bicol area covers 2480 hectares of irrigable area or roughly 3% of the total irrigable area of the province.

The BISA Program has organized eighteen (18) ISAs with a total membership of 1654 farmers of which 2/3 are small landowners/leaseholders and 1/3 are tenants.

Of the 18 small irrigation systems established in Camarines Sur, eleven or equivalent to 61% are diesel driven while seven or 39% are linked to the local electric cooperative.

For the base analysis, four diesel driven irrigation systems and one electrically powered were chosen.

B/C RATIO OF TOTAL PACKAGE (CAMARINES SUR)

NAME OF ISA	# HAS.	PV OF ISA COST				PV OF NET INCREMENTAL PRODUCTION BENEFITS			
		IRRIGATION	PRODUCTION	MARKETING	TOTAL	IRRIGATION	PRODUCTION	MARKETING	TOTAL
Fabrica II	100	362,791	103,214	99,065	565,070	795,879	242,473	243,255	1,281,601
Fabrica III	100	362,791	103,214	99,065	565,070	795,879	242,473	243,255	1,281,601
Sto. Domingo	50	261,781	51,607	49,533	363,921	397,940	121,237	121,628	640,804
San Vicente II	50	107,735	51,607	49,533	208,875	397,940	121,237	121,628	640,804
Upper Bubuatan	100	328,157	103,214	99,065	53,436	795,879	242,473	243,255	1,281,607

IRR - CONSOLIDATED (TOTAL PACKAGE)

NET INCREMENTAL BENEFITS

YEAR	FABRICA II	FABRICA III	STO. DOMINGO	SAN VICENTE II	UPPER BUBUATAN	TOTAL
1	- 67,830	- 67,830	- 54,549	- 29,733	- 65,495	- 285,437
2	32,228	32,228	1,755	32,249	40,201	238,661
3	69,518	69,518	20,400	50,894	77,491	287,821
4	213,898	213,898	92,590	123,084	221,871	865,341
5	240,798	240,798	106,040	136,534	248,771	972,941
6	253,958	253,958	112,620	143,114	261,931	1,025,581
7	253,958	253,958	112,620	143,114	261,931	1,025,581
8	253,958	253,958	112,620	143,114	261,931	1,025,581
9	253,958	253,958	112,620	143,114	261,931	1,025,581
10	253,958	253,958	112,620	143,114	261,931	1,025,581

$$\text{IRR CONSOLIDATED} = 100 + \frac{50\ (43,450)}{77,980}$$

$$= 127.86$$

ANNEX H
Exhibit 2(3)

CAMARINES SUR (CONSOLIDATED IRRIGATION PACKAGE)

YEAR	STO. DOMINGO	UPPER BUBUATAN	FABRICA II	FABRICA III	SAN VICENTE III	TOTAL
1	- 54,549	- 65,495	- 67,830	- 67,830	- 29,733	- 285,437
2	19,905	76,501	68,528	68,528	50,399	283,861
3	32,670	102,031	94,058	94,058	63,164	385,981
4	50,670	138,031	130,058	130,058	81,164	529,981
5	50,670	138,031	130,058	130,058	81,164	529,981
6	50,670	138,031	130,058	130,058	81,164	529,981
7	50,670	138,031	130,058	130,058	81,164	529,981
8	50,670	138,031	130,058	130,058	81,164	529,981
9	50,670	138,031	130,058	130,058	81,164	529,981
10	50,670	138,031	130,058	130,058	81,164	529,981

$$IRR = 100 + \frac{50\ (42,224)}{63,702}$$

$$= \underline{133.14}$$

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ANNEX H
Exhibit 2(4)

SALOCON - 99 Has.

IRRIGATION PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10
Construction	64,375	-	-	-	-	-	-	-	-	-
Operation & Maintenance	-	43,478	43,478	43,478	43,478	43,478	43,478	43,478	43,478	43,478
Training	2,079	3,861	-	-	-	-	-	-	-	-
Project Supervision	1,683	1,089	792	792	792	792	792	792	792	792
Administration	1,386	1,485	-	-	-	-	-	-	-	-
Field Engineers Services	-	1,980	1,980	-	-	-	-	-	-	-
Total ISA Cost	69,523	51,893	46,250	44,270	44,270	44,270	44,270	44,270	44,270	44,270
Discount Factor at 14%	.877	.769	.675							
Present Value of Total ISA Cost	60,972	39,906	31,219							
Total Incremental Benefits	-	269,280	302,940	336,600	336,600	336,600	336,600	336,600	336,600	336,600
Total Incremental Prod. Cost	-	126,254	140,283	267,597	267,597	267,597	267,597	267,597	267,597	267,597
Net Incremental Benefits	-	143,026	162,657	196,317	196,317	197,317	197,317	197,317	197,317	197,317
Present Value of Net Incremental Benefits	-	109,987	109,794							
B/C										3.03
Net Incremental Benefits	-69,523	91,133	116,407	152,047	152,047	152,047	152,047	152,047	152,047	152,047

$$IRR = 1 + \frac{.8\ (21431)}{21463 + 4091} = 1 + \frac{17145}{25554} = 1 + .67 = 1.67\%$$

198

ANNEX H
Exhibit 2(5)

STO. DOMINGO - 50 Has.

PRODUCTION PACKAGES

	YEAR									
	1	2	3	4	5	6	7	8	9	10
Construction	-	-	15,500	-	-	-	-	-	-	-
Operation & Maintenance	-	-	-	10,400	10,400	10,400	10,400	10,400	10,400	10,400
Training	-	1,950	-	-	-	-	-	-	-	-
Project Supervision	-	300	300	100	100	100	100	100	100	100
Administration	-	400	400	-	-	-	-	-	-	-
Total ISA Cost	-	2,650	16,200	10,500	10,500	10,500	10,500	10,500	10,500	10,500
Total Incremental Production Benefits	-	-	-	68,000	76,500	85,000	85,000	85,000	85,000	85,000
Total Incremental Production Cost	-	-	-	42,570	47,300	47,300	47,300	47,300	47,300	47,300
Net Incremental Production Benefits	-	-	-	25,430	29,200	37,700	37,700	37,700	37,700	37,700
Net Incremental Benefits	-	2,650	16,200	14,930	18,700	27,200	27,200	27,200	27,200	27,200

$$IRR = 80 + 20 \frac{(531.90)}{(878.45)} = 80 + 20\ (.61)$$

$$= 80 + 12.20$$

$$= \underline{92.20\%}$$

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ANNEX H
Exhibit 2(6)

FABRICA III - 100 Has.

RODUCTION PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10
Construction	-	-	31,000	-	-	-	-	-	-	-
Operation & Maintenance	-	-	-	20,800	20,800	20,800	20,800	20,800	20,800	20,800
Training	-	3,900	-	-	-	-	-	-	-	-
Project Supervision	-	600	600	200	200	200	200	200	200	200
Administration	-	800	800	-	-	-	-	-	-	-
Total ISA Cost	-	5,300	32,400	21,000	21,000	21,000	21,000	21,000	21,000	21,000
Total Incremental Production Benefits	-	-	-	136,000	153,000	170,000	170,000	170,000	170,000	170,000
Total Incremental Production Cost	-	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600
Net Incremental Production Benefits	-	-	-	50,860	58,400	75,400	75,400	75,400	75,400	75,400
Net Incremental Benefits	-	-5,300	-32,400	29,860	37,400	54,400	54,400	54,400	54,400	54,400

$$IRR = 80 + 20 \left(\frac{1,045.78}{1,738.90} \right) = 80 + 20\ (60)$$

$$= 80 + 12$$

$$= \underline{92\ \%}$$

ANNEX II
Exhibit 2(7)

FABRICA III - 100 Has.

MARKETING PACKAGE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
Construction	-	-	-	51,500	-	-	-	-	-	-
Operation & Maintenance	-	-	-	-	21,600	21,600	21,600	21,600	21,600	21,600
Training	-	-	1,000	-	-	-	-	-	-	-
Project Supervision	-	-	300	300	100	100	100	100	100	100
Administration	-	-	400	400	-	-	-	-	-	-
Total ISA Cost	-	-	1,700	52,200	21,700	21,700	21,700	21,700	21,700	21,700
Total Incremental Production Benefits	-	-	-	-	105,280	105,280	118,440	131,600	131,600	131,600
Total Incremental Production Cost	-	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600
Net Incremental Production Benefits	-	-	-	-	68,740	77,840	91,000	91,000	91,000	91,000
Net Incremental Benefits	-	-	-1,700	52,200	47,040	56,140	69,300	69,300	69,300	69,300

$$IRR = 90 + 10 \left(\frac{350.58}{501.66} \right) = 90 + 10 \ (.70)$$

$$= 90 + 7$$

$$= \underline{\underline{97\ \%}}$$

ANNEX H
Exhibit 2(8)

Q U E Z O N

A. PROFILE OF THE PROVINCE

Quezon province formerly known as Tayabas, lies along the eastern seacoast of Luzon. It stretches from Camarines Norte in the south to Isabela in the north, with the Sierra Madre mountain range running almost its entire length. Aside from its rugged terrain, the province is very narrow averaging approximately not more than 30 kilometers in width. Its boundaries are defined by the provinces of Nueva Ecija, Nueva Vizcaya, Bulacan, Rizal, Laguna and Batangas on the west and by Camarines Norte and Camarines Sur on the southwest. The province is presently composed of one city, forty-seven municipalities and one congressional district.

The third largest province in the Philippines, Quezon has a land area of 11,946.2 square kilometers, representing 4.6% of the country's total land area.

It has a population of 982,483 of which 64% are actively engaged in agriculture. The average annual income of 82% of total households is roughly ₱3,000 or equivalent to $428.52.

Quezon province is basically agricultural. The major crops grown are coconut, palay, vegetables, peanuts and other cash crops. Fishing is also considered an important occupation.

B. BARRIO IRRIGATORS' SERVICE ASSOCIATIONS (BISA PROGRAM)

The BISA Program has presently organized nine (9) ISA's in the province of Quezon. Its initial coverage is 1995 hectares equivalent to 4% of the total irrigable area of the province.

The nine irrigation systems now in the construction process are all diesel driven pumps. Five of these were selected for the base analysis.

ANNEX II
Exhibit 2-b(3)

IRR OF TOTAL PACKAGES FOR QUEZON PROVINCE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
AGDANGAN	-42,917	12,702	27,618	85,370	96,050	101,314	101,314	101,314	101,314	101,314
MALIGAYA	-43,119	12,702	27,618	85,370	96,050	101,314	101,314	101,314	101,314	101,314
BAKONG	-44,842	14,444	33,089	105,279	118,619	125,209	125,209	125,209	125,209	125,209
NAKAR	-255,397	67,740	153,507	485,581	546,991	577,259	577,259	577,259	577,259	577,259
TAGKAWA-YAN	-317,492	238,866	374,975	901.962	999,417	1,047,451	1,047,541	1,047,541	1,047,541	1,047,541
TOTAL NET INCREMENTAL BENEFITS	-703,768	346,454	616,807	1,663,562	1,857,137	1,952,547	1,952,547	1,952,547	1,952,547	1,952,547

$$\text{IRR} = \frac{-703,768}{(1+i)} + \frac{346,454}{(1+i)^2} + \frac{616,807}{(1+i)^3} + \frac{1,663,562}{(1+i)^4} + \frac{1,857,137}{(1+i)^5} + \frac{1,952,547}{(1+i)^6} \cdots \frac{1,952,547}{(1+i)^{10}} = 0$$

IRR = **106.7**

ANNEX H
Exhibit 2-b(4)

BAKONG, ALABAT, QUEZON (50 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	42,242	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	35,391	35,391	35,391	35,391	35,391	35,391	35,391	35,391	35,391	
Training	1,050	1,950	-	-	-	-	-	-	-	-	
Project Supplies	850	550	400	400	400	400	400	400	400	400	
Administration	700	750	-	-	-	-	-	-	-	-	
Field Engineers Services	-	1,000	1,000	-	-	-	-	-	-	-	
Total Cost	44,842	39,641	36,791	35,791	35,791	35,791	35,791	35,791	35,791	35,791	
Present Value of Total Cost	39,326	30,484	24,834	103,579	-	-	-	-	-	-	198,223
Total Inc'l Benefits	-	136,000	153,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	
Total Inc'l Prod. Cost	-	63,765	70,850	70,850	70,850	70,850	70,850	70,850	70,850	70,850	
Net Production Incremental Benefits	-	72,235	82,150	99,150	99,150	99,150	99,150	99,150	99,150	99,150	
Present Net Prod. Incremental Benefits	-	55,549	55,451	286,940	-	-	-	-	-	-	-397,940
B/C											2.01
IRR										97.11	

IRR = 97.11%

AGDANGAN, QUEZON (40 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	40,837	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	27,288	27,288	27,288	27,288	27,288	27,288	27,288	27,288	27,288	
Training	840	1,560	-	-	-	-	-	-	-	-	
Project Supplies	680	440	320	320	320	320	320	320	320	320	
Administration	560	600	-	-	-	-	-	-	-	-	
Field Engineers Services	-	800	800	-	-	-	-	-	-	-	
Total Cost	42,917	30,568	28,286	27,486	27,486	27,486	27,486	27,486	27,486	27,486	
Present Value of Total Cost	37,638	23,505	19,093	79,544	-	-	-	-	-	-	159,780
Total Incremental Benefits	-	108,800	122,400	136,000	136,000	136,000	136,000	136,000	136,000	136,000	
Total Incremental Prod. Cost	-	51,012	56,680	56,680	56,680	56,680	56,680	56,680	56,680	56,680	
Net Production Incremental Benefits	-	57,788	65,720	79,320	79,320	79,320	79,320	79,320	79,320	79,320	
Present Net Production Incremental Benefits	-	44,439	44,361	229,552							318,352
B/C											1.99
IRR										85.29%	

IRR = 85.29%

ANNEX II
Exhibit 2-b(5)

NAKAR, QUEZON (230 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	243,437	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	161,501	161,501	161,501	161,501	161,501	161,501	161,501	161,501	161,501	
Training	4,830	8,970	-	-	-	-	-	-	-	-	
Project Supplies	3,910	2,530	1,840	1,840	1,840	1,840	1,840	1,840	1,840	1,840	
Administration	3,220	3,450	-	-	-	-	-	-	-	-	
Field Engineers Services	-	4,600	4,600	-	-	-	-	-	-	-	
Total Cost	255,397	181,051	167,941	163,341	163,341	163,341	163,341	163,341	163,341	163,341	
Present Value of Total Cost	223,983	139,228	113,360	472,709	-	-	-	-	-	-	949,280
Total Incremental Benefits	625,600	703,800	782,000	782,000	782,000	782,000	782,000	782,000	782,000	782,000	
Total Incremental Prod. Cost	-	293,319	325,910	325,910	325,910	325,910	325,010	325,010	325,010	325,010	
Net Production Incremental Benefits	-	332,281	377,890	456,090	456,090	456,090	456,090	456,090	456,090	456,090	
Present Net Production Incremental Benefits	-	255,524	255,076	1,319,924	-	-	-	-	-	-	1,830,524
B/C											1.93
IRR										81.20%	

IRR = 81.20%

ANNEX H
Exhibit 2-b(6)

MALIGAYA, LAUAG, QUEZON (40 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	41,039	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	27,166	27,166	27,166	27,166	27,166	27,166	27,166	27,166	27,166	
Training	840	1,560	-	-	-	-	-	-	-	-	
Project Supplies	680	400	320	320	320	320	320	320	320	320	
Administration	560	600	-	-	-	-	-	-	-	-	
Field Engineers Services	-	800	800	-	-	-	-	-	-	-	
Total Cost	43,119	30,566	28,286	27,486	27,486	27,486	27,486	27,486	27,486	27,486	
Present Value of Total Cost	37,815	23,505	19,093	79,544	-	-	-	-	-	-	159,957
Total Incremental Benefits	-	108,800	122,400	136,000	136,000	136,000	136,000	136,000	136,000	136,000	
Total Incremental Prod. Cost	-	51,012	56,680	56,680	56,680	56,680	56,680	56,680	56,680	56,680	
Net Production Incremental Benefits	57,788	65,720	79,320	79,320	79,320	79,320	79,320	79,320	79,320	79,320	
Present Net Production Incremental Benefits	-	44,439	44,361	229,552	-	-	-	-	-	-	318,352
B/C											1.99
IRR										80.97%	

IRR = 80.97%

ANNEX II
Exhibit 2-b(8)

TAGKAWAYAN, QUEZON (365 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	298,513	-	--	--	-	-	-	-	-	-	
Operation & Maintenance	-	124,929	124,929	124,929	124,929	124,929	124,929	124,929	124,929	124,929	
Training	7,665	14,325	-	-	-	-	-	-	-	-	
Project Supervisor	6,205	4,015	2,920	2,920	2,920	2,920	2,920	2,920	2,920	2,920	
Administration	5,110	5,475	-	-	-	-	-	-	-	-	
Field Engineers Services	-	7,300	7,300	-	-	-	-	-	-	-	
Total ISA Cost	317,493	155,954	135,149	127,849	127,849	127,849	127,849	127,849	127,849	127,849	
Present Value ISA Total Cost	278,441	119,929	91,226	369,995	-	-	-	-	-	-	859,591
Total Inc'l Production Benefits	-	992,800	1,116,900	1,241,000	1,241,000	1,241,000	1,241,000	1,241,000	1,241,000	1,241,000	
Total Inc'l Production Cost	-	465,485	517,205	517,205	517,205	517,205	517,205	517,205	517,205	517,205	
Net Incremental Production Benefits	-	527,315	599,695	723,795	723,795	723,795	723,795	723,795	723,795	723,795	
Present Value of Net Incremental Prod. Benefits	-	405,505	404,794	2,094,663							2,904,962
B/C											3.38
IRR											136.51%
Net Incremental NPIB-TC	-317,493	371,361	464,546	595,946	595,946	595,946	595,946	595,946	595,946	595,946	

ANNEX II
Exhibit 2-1
(7)

NAKAR, QUEZON (230 Has.)

PRODUCTION INNOVATION

YEAR

	1	2	3	4	5	6	7	8	9	10	
Construction	71,300	--	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	47,840	47,840	47,840	47,840	47,840	47,840	47,840	47,840	
Training	8,970	-	-	-	-	-	-	-	-	-	
Project Supervision	-	1,380	1,380	-460	-460	460	460	460	460	460	
Administration	-	1,840	1,840	-	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	83,490	51,060	48,300	48,300	48,300	48,300	48,300	48,300	48,300	
Present Value of Total ISA Cost	-	64,204	34,466	139,780	-	-	-	-	-	-	238,450
Total Inc'l Production Benefits	-	-	312,800	351,900	391,000	391,000	391,000	391,000	391,000	391,000	
Total Inc'l Production Cost	-	-	195,822	217,580	217,580	217,580	217,580	217,580	217,580	217,580	
Net Inc'l Production Cost	-	-	116,978	134,320	173,420	173,420	173,420	173,420	173,420	173,420	
Present Value of Net Inc'l Production Benefits	-	-	78,960	79,517	399,213	-	-	-	-	-	557,690
B/C											2.34
IRR											102.45%
Net Inc. Ben. NPIB - TC	-	-83,490	65,918	86,020	125,120	125,120	125,120	125,120	125,120	125,120	

IRR = 102.45%

ANNEX H
Exhibit 2-b
(9)

NAKAR, QUEZON (230 Has.)

MARKETING PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	118,450	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	-	49,680	49,680	49,680	49,680	49,680	49,680	49,680	
Training	-	-	2,300-	-	-	-	-	-	-	-	
Project Supervision	-	-	690-	690-	230-	230	230	230	230	230	
Administration	-	-	920-	920-	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	122,360-	51,290	49,919-	49,919-	49,919-	29,919-	49,919-	49,919	
Discount Factor of 14%	.877	769	.675	592	519	456	399	351	308	269	
Present Value of Total ISA Cost	-	-	82,593-	30,364	114,893	-	-	-	-	-	227,850
Total Incremental Benefits	-	-	-	242,144-	272,412-	302,680	302,680-	302,680-	302,680	302,680-	
Total Incremental Production Benefits	-	-	-	84,042-	93,380-	93,380-	93,380-	93,380-	93,380-		
Net Production Incremental Benefits	-	-	-	158,102-	179,032-	209,300-	209,300-	209,300-	209,300	209,300-	
Present Net Production Incremental Benefits	-	-	-	93,596-	92,918-	373,182-	-	-	-	-	559,696-
B/C											2.46
IRR											102.61%

/2/

ANNEX H
Exhibit 2-b(10)

NAKAR, QUEZON (230 Has.) MARKETING PACKAGE (CONT'D) Page 2

YEAR	NET INCREMENTAL BENEFITS NFIC-TC	95%		100%		105%	
1		.513		500		488	
2		263		250		238	
3	- 122,360-	.135	-16,519-	.125	- 15,295-	.116	- 14,194-
4	106,812	069	7,370	063	6,729-	057	6,088-
5	129,122	035	4,519	031	4,003	028	3,615
6	159,390	018	5,579-	016	4,941-	013	4,144-
7	159,390-	009		008		007	
			.035		.031		.026
8	159,390-	005		004		003	
9	159,390	002		002		002	
10	159,390-	001		001		001	
					378		-347

$$IRR = 100 + 5 \left(\frac{378}{727}\right) = 100 + 2.61 = 102.61\%$$

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BAKONG, ALABAT, QUEZON (50 Has.)

MARKETING PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	25,750	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	-	10,800	10,800	10,800	10,800	10,800	10,800	10,800	
Training	-	-	500	-	-	-	-	-	-	-	
Project Supervisor	-	-	150	150	50	50	50	50	50	50	
Administration	-	-	200	200	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	26,600	11,150	10,850	10,850	10,850	10,850	10,850	10,850	
Present Value ISA Total Cost	-	-	17,955	6,601	24,977	-	-	-	-	-	49,533
Total Incremental Production Benefits	-	-	-	52,640	59,220	65,800	65,800	65,800	65,800	65,800	
Total Incremental Production Cost	-	-	-	18,270	20,300	20,300	20,300	20,300	20,300	20,300	
Net Incremental Production Benefits	-	-	-	34,370	38,920	45,500	45,500	45,500	45,500	45,500	
Present Value of Net Incremental Prod. Benefits	-	-	-	20,347	19,927	81,127	-	-	-	-	121,401
B/C										2.45	
Net Incremental Benefits NPIC-TC	-	-	-26,600	23,220	28,070	34,650	34,650	34,650	34,650	34,650	

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ANNEX H
Exhibit 2-b(11)

AGDANGAN, QUEZON (40 Has.)

TING PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	20,600	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	-	8,640	8,640	8,640	8,640	8,640	8,640	8,640	
Training	-	-	400	-	-	-	-	-	-	-	
Project Supervisor	-	-	120	120	40	40	40	40	40	40	
Administration	-	-	160	160	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	21,280	8,920	8,680	8,680	8,680	8,680	8,680	8,680	
Present Value ISA Total Cost	-	-	14,364	5,281	19,981	-	-	-	-	-	-
Total Incremental Production Benefits	-	-	-	42,112	47,376	52,640	52,640	52,640	52,640	52,640	
Total Incremental Production Cost	-	-	-	14,616	16,240	16,240	16,240	16,240	16,240	16,240	
Net Incremental Production Benefits	-	-	-	27,496	31,136	36,400	36,400	36,400	36,400	36,400	
Present Value of Net Incremental Prod. Benefits	-	-	-	16,278	16,159	64,901	-	-	-	-	97,338
B/C											2.46
Net Incremental Benefits NPIC-TC	-	-	-21,280	18,576	22,456	27,720	27,720	27,720	27,720	27,720	

ANNEX H
Exhibit 2-b(12)

TAGKAWAYAN, QUEZON (365 Has.)

MARKETING PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	187,975	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	-	78,840	78,840	78,840	78,840	78,840	78,840	78,840	
Training	-	-	3,650	-	-	-	-	-	-	-	
Project Supervision	-	-	1,095	1,095	365	365	365	365	365	40	
Administration	-	-	1,460	1,460	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	194,180	81,395	79,205	79,205	79,205	79,205	79,205	79,205	
Present Value ISA Total Cost	-	-	131,072	48,185	182,330	-	-	-	-	-	361,587
Total Inc'l Production Benefits	-	-	-	384,272	432,306	480,340	480,340	480,340	480,340	480,340	
Total Inc'l Production Cost	-	-	-	133,371	148,190	148,190	148,190	148,190	148,190	148,190	
Net Incremental Prod. Benefits	-	-	-	250,901	284,116	332,150	332,150	332,150	332,150	332,150	
Present Value of Net Inc'l Prod. Benefits	-	-	-	148,533	147,456	592,223					888,212
B/C											2.46
Net Incremental Benefits NPIC-TC	-	-	-194,180	169,506	204,911	252,945	252,945	252,945	252,945	252,945	

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ANNEX H
Exhibit 2-b(13)

TYPICAL PUMPING SET INSTALLATION COST

PROVINCE: QUEZON
NAME OF ISA

	AGDANGAN	BAKONG, ALABAT	MALIGAYA, CALAUAG	TAGKAWAYAN	ANOLING BANGLOS KATABLINGAN	TOTALS	
	40	50	90	345	230	755	
MATERIALS							
Pump and Motor Foundation	₱ 526.70	₱ 476.40	₱ 642.66	₱ 4,680.00	₱ 4,756.00	₱ 11,081.76	
Pump House	3,083.35	3,678.10	2,219.03	10,039.00	8,837.32	27,856.80	
Pump Sump and Channel	-	748.00	262.40	7,961.00	7,961.00	16,932.40	
Stilling Pool	1,057.10	1,299.70	1,005.00	4,316.00	4,316.00	11,993.80	
Canal Structures	5,186.40	1,795.20	2,266.50	24,586.00	13,288.00	47,122.10	
Pumping Unit	22,032.00	24,993.00	23,459.00	136,951.00	137,182.00	344,617.00	
LABOR							
Topographic Survey	1,200.00	1,500.00	1,200.00	10,950.00	6,900.00	21,750.00	
Pump and Motor Foundation	325.00	254.00	260.00	1,824.00	1,615.00	4,278.00	
Pump House	1,106.65	360.00	963.45	3,072.00	3,024.00	8,526.10	
Pump Sump	110.00	172.00	168.94	1,524.00	1,524.00	3,498.94	
Stilling Pool	449.00	356.00	370.00	1,050.00	1,036.00	3,221.00	
Road Crossing	1,700.00	720.00	835.00	7,560.00	4,224.00	15,039.00	
Canalization	1,055.00	2,500.00	4,300.00	62,938.00	30,240.00	101,033.00	
Pumping Unit	400.64	499.86	461.18	2,739.00	2,743.64	6,852.35	
Transport Cost	660.96	749.79	703.77	4,108.50	4,197.77	10,420.79	
CONTINGENCIES	1,944.64	2,139.55	1,954.25	14,214.93	11,592.24	31,845.61	
TOTALS	0,837.44	42,241.60	41,039.18	298,513.43	243,436.97		₱666,068.62

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ANNEX H
Exhibit 2-b(14)

A. PROFILE OF THE PROVINCE

La Union is located along the northwestern coast of Luzon. It is a narrow, mountainous strip of land bounded on the north and northeast by Ilocos Sur, on the north and southeast by Pangasinan and Benguet, respectively and on the west by the China Sea. The topography of the province is characterized by rolling semi-uplands interspersed with lowlands. Most of the lowlands are cultivated especially along the river valleys and plains near the coast.

La Union occupies an area of 1,493.1 square kilometers representing 0.5% of the total land area of the Philippines. The population is 373,682. It is one of the most densely populated provinces in the country. Sixty per cent of its economically active population derive its livelihood from agriculture. More than one-half of the total households receive ₱3,000 or less income per year.

The economy of the province is basically agricultural. Some of the major agricultural crops are palay, tobacco, kenafo, sugarcane, corn and vegetables.

B. BARRIO IRRIGATORS' SERVICE ASSOCIATIONS (BISA PROGRAM)

The BISA Program to date has organized eleven (11) ISAs in the province of La Union. The BISA Program covers 2240 hectares or equivalent to 7% of the total irrigable area. It has a total membership of 1616 farmer members where two-thirds are tenants and one-third are small landowners/leaseholders.

Four of the eleven ISAs are diesel driven irrigation system or 36% while seven or 64% are electrically powered.

The pumpsites are readily accessible by motor vehicl... all year round and are linked up by barrio roads or nation... highways.

For the base analysis, two diesel driven pumps and three electrically powered were randomly chosen.

ANNEX H
Exhibit 2-c(3)

BUCAYAB, BAUANG, LA UNION
(100 Has.)

BENEFIT COST RATIO OF TOTAL PACKAGES

A)	Present Value of Net Incremental Benefits of Irrigation Package	811,323
	Present Value of Net Incremental Benefits of Production Package	242,474
	Present Value of Net Incremental Benefits of Marketing Package	249,079
		1,302,876
B)	Present Value of ISA Cost of Irrigation Package	351,095
	Present Value of ISA Cost of Production Package	103,674
	Present Value of ISA Cost of Marketing Package	99,065
		553,834

$$B/C = \frac{A}{B} = \frac{1,302,876}{553,834} = 2.35$$

IRR OF TOTAL PACKAGES FOR LA UNION

	YEAR									
	1	2	3	4	5	6	7	8	9	10
GANA-CABA	-42,719	32,853	55,227	141,855	157,875	165,771	165,771	165,771	165,771	165,771
ROSARIO	-51,807	42,465	68,568	169,634	188,324	197,536	197,536	197,536	197,536	197,536
TUBAO	50,418	31,972	58,075	159,141	177,831	187,043	187,043	187,043	187,043	187,043
BUCAYAB BAUANG	-59,292	33,196	70,486	214,866	241,566	254,726	254,726	254,726	254,726	254,726
BACNOTAN	-71,183	79,295	135,230	351,800	391,850	411,590	411,590	411,590	411,590	411,590
TOTAL NET INCREMENTAL BENEFITS	-275,419	219,781	387,586	1,037,296	1,157,446	1,216,666	1,216,666	1,216,666	1,216,666	1,216,666

$$\text{IRR} = \frac{-275,419}{(1+i)^{1}} + \frac{219,781}{(1+i)^{2}} + \frac{387,586}{(1+i)^{3}} + \frac{1,037,296}{(1+i)^{4}} + \frac{1,157,446}{(1+i)^{5}} + \frac{1,216,666}{(1+i)^{6}} \cdots \frac{1,216,666}{(1+i)^{10}}$$

IRR = 146.80%

ANNEX H
Exhibit 2-c(4)

TUBAO, LA UNION (20 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	46,778	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	37,797	37,797	37,797	37,797	37,797	37,797	37,797	37,797	37,797	
Training	1,470	2,730	-	-	-	-	-	-	-	-	
Project Supervision	1,190	770	560	560	560	560	560	560	560	560	
Administration	980	1,050	-	-	-	-	-	-	-	-	
Field Engineers Services	-	1,400	1,400	-	-	-	-	-	-	-	
Total ISA Cost	50,418	43,747	39,757	38,357	38,357	38,357	38,357	38,357	38,357	38,357	
Present Value of Total ISA Cost	44,216	33,641	26,836	111,005	-	-	-	-	-	-	215,698
Total Incremental Benefits	-	190,400	214,200	238,000	238,000	238,000	238,000	238,000	238,000	238,000	
Total Incremental Prod. Cost	-	89,271	99,190	99,190	99,190	99,190	99,190	99,190	99,190	99,190	
Net Incremental Prod. Benefits	-	101,129	115,010	138,810	138,810	138,810	138,810	138,810	138,810	138,810	
Present Value of Net Incremental Benefits	-	77,768	77,632	401,716	-	-	-	-	-	-	557,116
B/C										2.58	
Net Incremental Benefits	-50,418	57,382	75,253	100,453	100,453	100,453	100,453	100,453	100,453	100,453	

IRR = 138.4%

ANNEX II
Exhibit 2-c(5)

GANA-CABA, LA UNION (60 Has.)

IRRIGATION PACKAGE

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	YEAR 1	2	3	4	5	6	7	8	9	10	
Construction	39,599	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	26,949	26,949	26,949	26,949	26,949	26,949	26,949	26,949	26,949	
Training	1,260	2,340	-	-	-	-	-	-	-	-	
Project Supervision	1,020	660	480	480	480	480	480	480	480	480	
Administration	840	900	-	-	-	-	-	-	-	-	
Field Engineers Services	-	1,200	1,200	-	-	-	-	-	-	-	
Total ISA Cost	42,719	32,049	28,629	27,429	27,429	27,429	27,429	27,429	27,429	27,429	
Discount Factor	.877	.769	.675	2.894	-	-	-	-	-	-	
Present Value of Total ISA Cost	37,465	24,646	19,325	79,380	-	-	-	-	-	-	160,816
Total Incremental Benefits	-	163,200	183,600	204,000	204,000	204,000	204,000	204,000	204,000	204,000	
Total Incremental Prod. Cost.	-	76,518	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020	
Net Incremental Prod. Benefits	-	86,682	98,580	118,980	118,980	118,980	118,980	118,980	118,980	118,980	
Present Value of Net Inc'l Prod. Benefits	-	66,658	66,542	344,328	-	-	-	-	-	-	477,528
B/C										2.96	
Net Incremental Benefits	-42,719	54,633	69,951	91,551	91,551	91,551	91,551	91,551	91,551	91,551	

IRR = 149.95%

ANNEX H
Exhibit 2-c(6)

TUBAO, LA UNION
(70 Has.)

PRODUCTION PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PROD. BENEFITS	B/C	ANNUAL NET INCREMENTAL BENEFITS
1				
2	72,572	169,731	2.33	-25,410
3				20,062
4				26,180
5				38,080
6				38,080
7				38,080
8				38,080
9				38,080
10				38,080

MARKETING PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PROD. BENEFITS	B/C	ANNUAL NET INCREMENTAL BENEFITS
1				
2	69,345	170,342	2.45	
3				-37,240
4				32,508
5				39,298
6				48,510
7				48,510
8				48,510
9				48,510
10				48,510

ANNEX H
Exhibit 2-c(8)

BACNOTAN, LA UNION
(150 Has.)

PRODUCTION PACKAGE

YEAR	TOTAL ISA COST	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INC'L PROD. BENEFITS	B/C	ANNUAL NET INC'L BENEFITS	NET INC'L PRODUCTION BENEFITS
1						
2	54,450	41,872			-54,450	
3	33,300	22,477	51,496		42,990	76,290
4	31,500	91,161	51,859		56,100	87,600
5	31,500		260,355		81,600	113,100
6	31,500				81,600	113,100
7	31,500				81,600	113,100
8	31,500				81,600	113,100
9	31,500				81,600	113,100
10	31,500			2.33	81,600	113,100
TOTAL		155,510	363,710			

MARKETING PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PROD. BENEFITS	B/C	ANNUAL NET INCREMENTAL PROD. BENEFITS
1				
2				
3	148,597	365,019	2.45	-79,800
4				69,660
5				84,210
6				103,950
7				103,950
8				103,950
9				103,950
10				103,950

ANNEX H
Exhibit 2-1(2)

ROSARIO, LA UNION
(70 Has.)

PRODUCTION PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PRODUCTION BENEFITS	B/C	ANNUAL NET INCREMENTAL BENEFITS
1				
2	72,572	169,731	2.33	-25,410
3	-	-	-	20,062
4	-	-	-	26,180
5	-	-	-	38,080
6	-	-	-	38,080
7	-	-	-	38,080
8	-	-	-	38,080
9	-	-	-	38,080
10	-	-	-	38,080

MARKETING PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PRODUCTION BENEFITS	B/C	ANNUAL NET INCREMENTAL BENEFITS
1	69,345	170,342	2.45	-
2	-	-	-	-
3	-	-	-	-37,240
4	-	-	-	32,508
5	-	-	-	39,298
6	-	-	-	48,510
7	-	-	-	48,510
8.	-	-	-	48,510
9	-	-	-	48,510
10	-	-	-	48,510

ANNEX H
Exhibit 2-c(10)

GANA-CABA, LA UNION
(60 Has.)

PRODUCTION PACKAGE

YEAR	PRESENT VALUE OF TOTAL ISA COST	PRESENT VALUE OF NET INCREMENTAL PRODUCTION BENEFITS	B/C	ANNUAL NET INCREMENTAL BENEFITS
1				
2				-21,780
3				17,196
4				22,440
5				32,640
6				32,640
7				32,640
8				32,640
9				32,640
0			2.34	32,640

IRR = 93.60%

ANNEX H
Exhibit 2-c(1.1)

ANNUAL BENEFITS

TUBAO, LA UNION
Name of ISA
(20 Has.)

ITEM	Without Irrigation	Irrigation Package	Production Package	Marketing Package
A. Planted Area	70	70	70	70
B. Yield/Ha. (Palay)	38	106	140	140
C. Unit Cost/Cavan	50	50	50	95
D. Gross Benefit/Ha.	1,900	5,300	7,000	8,3[illegible]
E. Production Cost/Ha.	1,180	2,597	3,543	3,949
F. Total Benefits	133,000	371,000	490,000	582,1[illegible]
G. Total Incremental Benefits over Previous Package		238,000	119,000	92,1[illegible]
H. Total Prod. Cost	82,600	181,790	248,010	276,4[illegible]
I. Total Incremental Prod. Cost over Previous Package		99,190	66,220	28,[illegible]
J. Net Benefits (F)	50,400	189,210	241,990	305,6[illegible]
K. Net Incremental Benefits over Previous Package		138,810	52,780	63,700

ANNEX H
Exhibit 2-c(12)

ANNUAL BENEFITS

BICNOTAN, LA UNION
Name of ISA
(150 Has.)

ITEM	Without Irrigation	Irrigation Package	Production Package	Marketing Package
A. Planted Area	150	150	150	150
B. Yield/Ha. (Palay)	38	106	140	140
C. Unit Cost/Cavan	50	50	50	95 (rice)
D. Gross Benefit/Ha.	1,900	5,300	7,000	8,316
E. Production Cost/Ha.	1,180	2,597	3,543	3,949
F. Total Benefits	285,000	795,000	1,050,000	1,247,400
G. Total Incremental Benefits over Previous Package	-	510,000	255,000	197,400
H. Total Prod. Cost	177,000	389,550	531,450	592,350
I. Total Incremental Prod. Cost over Previous Package	-	212,550	141,900	60,900
J. Net Benefits (₱)	108,000	405,450	518,550	655,050
K. Net Incremental Benefits over Previous Package	-	297,450	113,100	136,500

ANNEX H
Exhibit 2-c(13)

ANNUAL BENEFITS

ROSARIO, LA UNION
Name of ISA
(20 Has.)

ITEM	Without Irrigation	Irrigation Package	Production Package	Marketing Package
A. Planted Area	70	70	70	70
B. Yield/Ha. (Palay)	38	106	140	140
C. Unit Cost/Cavan	50	50	50	95
D. Gross Benefit/Ha.	1,900	5,300	7,000	8,316
E. Production Cost/Ha.	1,180	2,597	3,543	3,949
F. Total Benefits	133,000	371,000	490,000	582,120
G. Total Incremental Benefits over Previous Package		238,000	119,000	92,120
H. Total Prod. Cost	82,600	181,790	248,010	276,430
I. Total Incremental Prod. Cost over Previous Package		99,190	66,220	28,420
J. Net Benefits (P)	50,400	189,210	241,990	205,690
K. Net Incremental Benefits over Previous Package		138,810	52,780	63,700

ANNEX H
Exhibit 2-c(14)

ANNUAL BENEFITS

BUCAYAB, BAUANG, LA UNION
Name of ISA
(100 Has.)

ITEM	Without Irrigation	Irrigation Package	Production Package	Marketing Package
A. Planted Area	100	100	100	100
B. Yield/Ha. (Palay)	38	106	140	140 (84)
C. Unit Cost/Cavan	50	50	50	95
D. Gross Benefit/Has.	1,900	5,300	7,000	8,316
E. Production Cost/Ha.	1,180	2,597	3,543	3,949
F. Total Benefits	190,000	530,000	100,000	831,600
G. Total Incremental Benefits over Previous Package		340,000	170,000	131,600
H. Total Prod. Cost	118,000	259,700	354,300	394,900
I. Total Incremental Prod. Cost over Previous Package		141,700	94,600	40,600
J. Net Benefits (P)	72,000	270,300	345,700	436,700
K. Net Incremental Benefits over Previous Package		198,300	75,400	91,000

ANNEX H
Exhibit 2-c(15)

ANNUAL BENEFITS

GANA-CABA, LA UNION
Name of ISA.
(60 Has.)

ITEM	Without Irrigation	Irrigation Package	Production Package	Marketing Package
A. Planted Area	60 Has.	60 Has.	60 Has.	60 Has.
B. Yield/Ha. (Palay)	38	106	140	140
C. Unit Cost/Cavan ₱	50	50	50	95 (rice)
D. Gross Benefit/Ha.	1,900	5,300	7,000	8,316
E. Production Cost/Ha.	1,180	2,597	3,543	3,949
F. Total Benefits	114,000	318,000	420,000	498,960
G. Total Incremental Benefits over Previous Package		204,000	102,000	78,960
H. Total Prod. Cost	70,800	155,820	212,580	236,940
I. Total Incremental Prod. Cost over Previous Package		85,020	56,760	24,360
J. Net Benefits (₱)	43,200	162,180	207,420	262,020
K. Net Incremental Benefits over Previous Package		118,980	45,240	54,600

ANNEX H
Exhibit 2-c(1c)

TUBAO, LA UNION
(70 Has.)

NET INCREMENTAL BENEFITS

YEAR	IRRIGATION	PRODUCTION	MARKETING	TOTAL
1	-50,418	-	-	50,418
2	57,382	-25,410		31,9[illegible]
3	75,253	20,062	-37,240	58,[illegible]
4	100,453	26,180	32,508	159,141
5	100,453	38,080	39,298	177,831
6	100,453	38,080	48,510	187,[illegible]
7	100,453	38,080	48,510	187,043
8	100,453	38,080	48,510	187,043
9	100,453	38,080	48,510	167,043
10	100,453	38,080	48,510	187,043

ANNEX H
Exhibit 2-c(17)

BACNOTAN, LA UNION
(150 Has.)

NET INCREMENTAL BENEFITS

YEAR	IRRIGATION	PRODUCTION	MARKETING	TOTAL
1	-71,183	-	-	-71,183
2	133,745	-54,450	-	79,295
3	172,040	42,990	-79,800	135,230
4	226,040	56,100	69,660	351,800
5	226,040	81,600	84,210	391,850
6	226,040	81,600	103,950	411,590
7	226,040	81,600	103,950	411,590
8	226,040	81,600	103,950	411,590
9	226,040	81,600	103,950	411,590
10	226,040	81,600	103,950	411,590

ANNEX H
Exhibit 2-c(18)

ROSARIO, LA UNION
(70 Has.)

NET INCREMENTAL BENEFITS

YEAR	IRRIGATION	PRODUCTION	MARKETING	TOTAL
1	-51,807	"	"	-51,807
2	67,875	-25,410	"	42,465
3	85,746	20,062	-37,240	68,568
4	110,946	26,180	32,508	169,634
5	110,946	38,080	39,298	188,324
6	110,946	38,080	48,510	197,536
7	110,946	38,080	48,510	197,536
8	110,946	38,080	48,510	197,536
9	110,946	38,080	48,510	197,536
10	110,946	38,080	48,510	197,536

ANNEX H
Exhibit 2-c(19)

BUCAYAB, BAUANG, LA UNION
100 Has.

NET INCREMENTAL BENEFITS

YEAR	IRRIGATION	PRODUCTION	MARKETING	TOTAL
1	-59,292			-59,292
2	69,496	-36,300		33,196
3	95,026	28,660	-53,200	70.486
4	131,026	37,400	46,440	214,866
5	131,026	54,000	56,140	241,566
6	131,026	54,400	69,300	254,726
7	131,026	54,400	69,300	254,726
8	131,026	54,400	69,300	254,726
9	131,026	54,400	69,300	254,726
10	131,026	54,400	69,300	254,726

GANA-CABA, LA UNION (60 Has.)

NET INCREMENTAL BENEFITS

YEAR	IRRIGATION	INNOVATION	MARKETING	TOTAL
1	-42,719			-42,719
2	54,633	-21,780		32,853
3	69,951	17,196	-31,920	55,227
4	91,551	22,440	27,864	141,855
5	91,551	32,640	33,684	157,875
6	91,551	32,640	41,580	165,771
7	91,551	32,640	41,580	165,771
8	91,551	32,640	41,580	165,771
9	91,551	32,640	41,580	165,771
10	91,551	32,640	41,580	165,771

BUCAYAB, BAUANG - LA UNION (100 Has.)

MARKETING PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	51,500	-	-	-	-	-	-	-	
Operation and Maintenance	-	-	-	21,600	21,600	21,600	21,600	21,600	21,600	21,600	
Training	-	-	1,000	-	-	-	-	-	-	-	
Project Supervision	-	-	300	300	100	100	100	100	100	100	
Administration	-	-	400	400	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	53,200	22,300	21,700	21,700	21,700	21,700	21,700	21,700	
Present Value of Total ISA Cost	-	-	35,910	13,202	49,953	-	-	-	-	-	99,065
Total Incremental Production Benefits	-	-	-	105,280	118,410	131,600	131,600	131,600	131,600	131,600	
Total Incremental Production Cost	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600	
Net Incremental Production Benefits	-	-	-	40,694	40,338	162,253	-	-	-	-	243,346
B/C										2.46	
IRR Net Incremental Benefits	-	-	-53,200	46,440	56,140	69,300	69,300	69,300	69,300	69,300	

IRR = 101.80%

ANNEX II
Exhibit 2-c(21)

BUCAYAB, BAUANG, LA UNION (100 Has.)

PRODUCTION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	-	31,000	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	20,800	20,800	20,800	20,800	20,800	20,800	20,800	20,800	
Training	-	3,000	-	-	-	-	-	-	-	-	
Project Supervision	-	600	600	200	200	200	200	200	200	200	
Administration	-	800	800	-	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	36,300	22,200	21,000	21,000	21,000	21,000	21,000	21,000	21,000	
Present Value of Total ISA Cost	-	27,915	14,985	60,774	-	-	-	-	-	-	103,674
Total Incremental Benefits	-	-	136,000	153,000	170,000	170,000	170,000	170,000	170,000	170,000	
Total Incremental Prod. Cost	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600	
Net Incremental Prod. Benefits	-	-	50,860	58,400	75,400	75,400	75,400	75,400	75,400	75,400	
Present Value of Net Incremental Prod. Benefits	-	-	34,331	34,573	173,570	-	-	-	-	-	242,474
B/C										2.33	
Net Incremental Benefits	-	-36,300	28,660	37,400	54,400	54,400	54,400	54,400	54,400	54,000	

IRR = 97.70%

841

ANNEX II
Exhibit 2-r(22)

BACNOTAN, LA UNION (150 Has.)

IRRIGATIONS PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	39,599	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	26,949	26,949	26,949	26,949	26,949	26,949	26,949	26,949	26,949	
Training	1,060	2,340	-	-	-	-	-	-	-	-	
Project Supervision	1,020	660	480	480	480	480	480	480	480	480	
Administration	840	900									
Field Engineers Services	-	1,200	1,200	-	-	-	-	-	-	-	
Total ISA Cost	42,719	32,049	28,629	27,429	27,429	27,429	27,429	27,429	27,429	27,429	
Present Value of Total ISA Cost	37,465	24,646	19,325	79,380	-	-	-	-	-	-	160,816
Total Inc'l Benefits	-	163,200	183,600	204,000	204,000	204,000	204,000	204,000	204,000	204,000	
Total Inc'l Production Cost	-	76,518	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020	
Net Inc'l Benefits	-	86,682	98,589	118,980	118,980	118,980	118,980	118,980	118,980	118,980	
Present Value of Inc'l Benefits	-	66,658	66,542	344,328							477,528
B/C											2.96
Net Incremental Benefits	42,719	54,633	69,951	91,551	91,551	91,551	91,551	91,551	91,551	91,551	

IRR = $145 + 5 \left(\frac{715.19}{716.41}\right)$

= 145 + 5 (.99)

= 145 + 4.95

= 149.95%

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ANNEX II
Exhibit 2-c(23)

BACNOTAN, LA UNION (150 Has.) IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	63,383	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	70,210	70,210	70,210	70,210	70,210	70,210	70,210	70,210	70,210	
Training	3,150	5,850	-	-	-	-	-	-	-	-	
Project Supervision	2,550	1,650	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	
Administration	2,100	2,250	-	-	-	-	-	-	-	-	
Field Engineers Services	-	3,000	3,000	-	-	-	-	-	-	-	
Total ISA Cost	71,183	82,960	74,410	71,410	71,410	71,410	71,410	71,410	71,410	71,410	
Present Value of Total ISA Cost	62,427	63,796	50,227	206,660	-	-	-	-	-	-	383,110
Total Incremental Benefits	-	408,000	459,000	510,000	510,000	510,000	510,000	510,000	510,000	510,000	
Total Incremental Prod. Cost	-	191,295	212,550	212,550	212,550	212,550	212,550	212,550	212,550	212,550	
Net Incremental Prod. Benefits	-	216,705	246,450	297,450	297,450	297,450	297,450	297,450	297,450	297,450	
Present Value of Net Increment Prod. Benefits	-	166,646	166,353	860,820	-	-	-	-	-	-	1,193,819
B/C										3.11	
Net Incremental Benefits	-71,183	133,745	172,040	226,040	226,040	226,040	226,040	226,040	226,040	226,040	

IRR = 213.4%

ROSARIO, LA UNION (70 Has.)

IRRIGATION PACKAGE

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	48,167	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	27,304	27,304	27,304	27,304	27,304	27,304	27,304	27,304	27,304	
Training	1,470	2,730	-	-	-	-	-	-	-	-	
Project Supervision	1,190	770	560	560	560	560	560	560	560	560	
Administration	980	1,050	-	-	-	-	-	-	-	-	
Field Engineers Services	-	1,400	1,400	-	-	-	-	-	-	-	
Total ISA Cost	51,807	33,254	29,264	27,864	27,864	27,864	27,864	27,864	27,864	27,864	
Discount Factor	.817	.769	.675	-	-	-	-	-	-	-	
Present Value of Total ISA Cost	45,435	25,572	19,753	80,638	80,638	80,638	80,638	80,638	80,638	80,638	171,398
Total Incremental Benefits	-	190,400	214,200	238,000	238,000	238,000	238,000	238,000	238,000	238,000	
Total Incremental Prod. Cost	-	89,271	99,190	99,190	99,190	99,190	99,190	99,190	99,190	99,190	
Net Incremental Prod. Benefits	-	101,129	115,010	138,810	138,810	138,810	138,810	138,810	138,810	138,810	
Present Value of Net Incremental Prod. Benefits	-	77,768	77,632	401,716	-	-	-	-	-	-	557,116
B/C										3.25	
Net Incremental Benefits	-51,807	67,875	85,746	110,946	110,946	110,946	110,946	110,946	110,946	110,946	

IRR = 152.2%

ANNEX H
Exhibit 2-c(24)

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BUCAYAB, BAUANG, LA UNION (100 Has.)

IRRIGATION

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	54,092	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	66,474	66,474	66,474	66,474	66,474	66,474	66,474	66,474	66,474	
Training	2,100	3,900	-	-	-	-	-	-	-	-	
Project Supervision	1,700	1,100	800	800	800	800	800	800	800	800	
Administration	1,400	1,500	-	-	-	-	-	-	-	-	
Field Engineers Services	-	2,000	2,000	-	-	-	-	-	-	-	
Total ISA Cost	59,292	74,974	69,274	67,274	67,274	67,274	67,274	67,274	67,274	67,274	
Present Value of Total ISA Cost	51,990	57,655	46,760	194,690	-	-	-	-	-	-	351,095
Total Incremental Prod. Benefits	-	272,000	306,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	
Total Incremental Prod. Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,7000	
Net Incremental Prod. Benefits	-	144,470	164,300	198,300	198,300	198,300	198,300	198,300	198,300	198,300	
Present Value of Net Inc'l. Prod. Benefits	-	111,097	126,346	573,880	-	-	-	-	-		881,323
B/C										2.31	
Net Incremental Benefits	-59,292	69,496	95,026	131,026	131,026	131,026	131,026	131,026	131,026	131,026	

$$IRR = \frac{-59,292}{(1+i)^1} + \frac{69,496}{(1+i)^2} + \frac{95,026}{(1+i)^3} + \frac{131,026}{(1+i)^4} \cdots \frac{131,026}{(1+i)^{10}}$$

IRR = 144.9%

ANNEX H
Exhibit 2-c(25)

BUCAYAB, BAUANG, LA UNION (100 Has.)

IRRIGATION

	YEAR										
	1	2	3	4	5	6	7	8	9	10	
Construction	54,092	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	66,724	66,724	66,724	66,724	66,724	66,724	66,724	66,724	66,724	
Training	2,100	3,900	-	-	-	-	-	-	-	-	
Project Supervision	1,705	1,100	800	800	800	800	800	800	800	800	
Administration	1,400	1,300	-	-	-	-	-	-	-	-	
Field Engineers Services	-	2,000	2,000	-	-	-	-	-	-	-	
Total ISA Cost	59,292	74,974	69,274	67,274	67,274	67,274	67,274	67,274	67,274	67,274	
Present Value of Total ISA Cost	51,990	57,655	46,760	194,690	-	-	-	-	-	-	351,095
Total Incremental Production Benefits	-	272,000	306,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	
Total Incremental Production Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700	
Net Incremental Production Benefits	-	144,470	164,300	198,300	198,300	198,300	198,300	198,300	198,300	198,300	
Present Value of Net Incremental Production Benefits	-	111,097	126,346	573,880	-	-	-	-	-	-	811,323
B/C										2.31	
IRR Net Incremental Benefits	-59,292	69,496	95,026	131,026	131,026	131,026	131,026	131,026	131,026	131,026	

IRR = 144.9%

4-91

BUCAYAB, BAUANG - LA UNION (100 Has.)

PRODUCTION PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10	
Construction	-	31,000	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	20,800	20,800	20,800	20,800	20,800	20,800	20,800	20,800	
Training	-	3,900	-	-	-	-	-	-	-	-	
Project Supervision	-	600	600	200	200	200	200	200	200	200	
Administration	-	800	800	-	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	36,300	22,200	21,000	21,000	21,000	21,000	21,000	21,000	21,000	
Present Value of Total ISA Cost	-	27,915	14,985	60,774	-	-	-	-	-	-	103,674
Total Incremental Production Benefits	-	-	136,000	153,000	170,000	170,000	170,000	170,000	170,000	170,000	
Total Incremental Production Cost	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600	
Net Incremental Production Benefits	-	-	50,860	58,400	75,400	75,400	75,400	75,400	75,400	75,400	
Present Value of Net Incremental Prod. Benefits	-	-	34,335	34,573	173,570	-	-	-	-	-	242,474
B/C											2.33
IRR Net Incremental Benefits	-36,300	28,660	37,400	54,400	54,400	54,400	54,400	54,400	54,400	54,400	

IRR = 97.70%

ANNEX H
Exhibit 2-c(26)

BUCAYAB, BAUANG, LA UNION (100 Has.)

MARKETING PACKAGE

	1	2	3	4	5	6	7	8	9	10	
Construction	-	-	51,500	-	-	-	-	-	-	-	
Operation & Maintenance	-	-	-	21,600	21,600	21,600	21,600	21,600	21,600	21,600	
Training	-	-	1,000	-	-	-	-	-	-	-	
Project Supervision	-	-	300	300	100	100	100	100	100	100	
Administration	-	-	400	400	-	-	-	-	-	-	
Field Engineers Services	-	-	-	-	-	-	-	-	-	-	
Total ISA Cost	-	-	53,200	22,300	21,700	21,700	21,700	21,700	21,700	21,700	
Discount Factor	-	-	.675	.592	.519	.456	2.302	-	-	-	
Present Value of Total ISA Cost	-	-	35,910	13,202	59,953	-	-	-	-	-	99,063
Total Incremental Benefits	-	-	-	105,280	118,440	131,600	131,600	131,600	131,600	131,600	
Total Incremental Prod. Cost	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600	
Net Incremental Prod. Benefits	-	-	-	68,740	77,840	91,000	91,000	91,000	91,000	91,000	
Present Value of Net Incremental Prod. Benefits	-	-	-	40,694	40,399	162,253	-	-	-	-	243,346
B/C										2.46	
Net Incremental Benefits	-	-	-53,200	46,440	56,140	69,300	69,300	69,300	69,300	69,300	

IRR = 101.80%

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ANNEX H
Exhibit 2-c(27)

TYPICAL PUMPING SET INSTALLATION COST

PROVINCE: LA UNION
NAME OF ISA

MATERIALS	BUCAYAB, BAUANG 100	GANA-CABA 60	STA. TERESA, TUBAO 70	CATAGUINTINGAN 60	CABUGAO, BACNOTAN 150	TOTALS 440	
Pump and Motor Foundation	₱ 1,101.00	₱ 558.00	₱ 558.00	₱ 588.00	₱ 788.00	₱ 3,563.00	
Pump House	4,064.55	4,059.85	4,059.85	4,060.00	3,059.85	19,304.14	
Pump Sump and Channel	2,008.00	-	-	-	-	2,008.00	
Stilling Pool	690.00	690.00	690.00	690.00	690.45	3,450.45	
Canal Structures	796.00	858.00	796.00	796.00	796.00	4,042.00	
Pumping Unit	30,701.55	23,090.80	28,307.32	29,165.05	42,259.10	153,523.82	
LABOR							
Topographic Survey	3,000.00	1,800.00	2,100.00	2,100.00	4,500.00	13,500.00	
Pump and Motor Foundation	495.00	250.00	250.00	251.00	354.60	1,600.00	
Pump House	1,826.93	1,826.93	1,826.93	1,826.93	1,386.93	8,694.65	
Pump Sump	1,030.00		-	-	-	1,030.00	
Stilling Pool	330.00	310.00	310.00	310.00	310.00	1,570.00	
Road Crossing	358.00	386.00	358.00	358.00	356.85	1,816.85	
Canalization	4,000.00	2,800.00	4,200.00	4,300.00	4,000.00	19,300.00	
Pumping Unit	614.00	461.81	566.15	583.30	889.18	3,114.44	
Transport Cost	924.04	692.72	849.22	874.95	1,173.80	4,511.73	
CONTINGENCIES	2,155.93	1,814.89	1,906.49	2,293.77	2,818.24	10,989.32	
TOTALS	₱54,092.00	₱39,599.00	₱46,778.00	₱48,167.00	₱63,383.00		₱252,019.00

ANNEX H
Exhibit 2-c(28)

ANNEX H
Exhibit 2-d

C A P I Z

A. PROFILE OF THE PROVINCE

One of the four provinces comprising the island of Panay, Capiz is bounded by the Sibuyan Sea on the north, the province of Aklan on the northwest, Antique on the west and Iloilo on the south and southwest. The northern part of the province is made up mostly of plains while the western part is hilly. The water adjacent to its coastline which is approximately 80 kilometers long, constitute one of the richest fishing grounds in the western Visayas region.

The province has a land area of 2633.2 square kilometers which is 0.9 per cent of the total land area of the Philippines. It is composed of 16 municipalities, one city and two congressional districts.

It has a population of 394,041 of which 334,358 or 84.8% is considered rural. Of the total persons in the labor force, 67,570 or 77.24% is employed in agriculture. The average annual income of 83% of total households is around ₱3,000 and below or equivalent to $428.52.

The economy of Capiz is basically agricultural. The production of palay (rough rice) is the major agricultural crop. Other crops produced are corn, coconut, sugarcane, mango and other cash crops.

B. BARRIO IRRIGATORS' SERVICE ASSOCIATIONS (BISA PROGRAM)

The BISA Program in Capiz covers a total of 28,963 farms or 5,330 hectares. The coverage is 22.42% of the total irrigable area of the province. It has a total membership of 2,234 farmers or households where a great bulk is composed of small landowners or leaseholders with an average farm size of 1.25 to 2 hectares and a third composed of tenants.

The BISA Program has organized 43 Irrigators' Service Associations (ISAs) and has put up 43 small scale irrigation systems. Of these, 74% or 32 irrigation projects are tied up with the rural electrification cooperatives. Diesel pumps comprise 26% of the BISA Program in Capiz.

Most of the pump sites are accessible by motor vehicles all year round and are within short distances from the poblacion or town proper. A small number is accessible by boat or banca or by hiking during the wet season.

Five represented ISAs were selected for the base analysis. These five are electrically driven irrigation systems. The lack of data for diesel driven ISA prevented its inclusion in the base analysis.

CAPIZ (CONSOLIDATED)

NAME OF ISA	HAS.	PV OF ISA COST IRRIGATION	PRODUCTION	MARKETING	TOTAL	PV OF NET INCREMENTAL PRODUCTION BENEFITS IRRIGATION	PRODUCTION	MARKETING	TOTAL
Ilaya-Ilawod	100	322,378	203,214	99,065	524,797	811,323	242,473	243,255	1,299,051
Salocon	99	260,214	102,182	98,074	460,470	787,922	240,048	240,822	1,268,792
Ambilay	40	162,227	41,286	39,626	243,139	318,352	96,989	97,302	412,643
Pasugue	80	312,738	82,571	79,252	474,561	636,704	193,978	194,604	1,025,286
Agkilo	100	253,990	403,214	99,065	756,269	811,323	242,473	243,255	1,291,051
					2,159,236				8,400,825

B/C = 2.5

CAPIZ(CONSOLIDATED)

YEAR	ILAYA-ILAWOD	SALOCON	AMBILAY	PASUGUE	AGKILO	TOTAL
1	-76,803	-69,523	-33,947	-49,967	-57,450	287,690
2	43,358	55,196	70,325	21,291	55,211	185,381
3	80,648	92,112	25,241	45,823	92,501	336,028
4	225,028	235,049	82,993	165,587	236,881	945,538
5	251,928	261,680	93,753	187,107	263,781	1,058,249
6	265,088	274,708	99,017	197,635	276,941	1,113,389
7	265,088	274,708	99,017	197,635	276,941	1,113,389
8	265,088	274,708	99,017	197,635	276,941	1,113,389
9	265,088	274,708	99,017	197,635	276,941	1,113,389
10	265,088	274,708	99,017	197,635	276,941	1,113,389

$$IRR = 100 + 50 \frac{(70,375)}{91,717}$$

$$= 138.36\%$$

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ANNEX H
Exhibit 2-d(3)

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ILAYA-ILAWOD, CAPIZ (100 Has.) IRRIGATION PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10	
Construction	71,603	-	-	-	-	-	-	-	-	-	
Operation & Maintenance	-	56,312	56,312	56,312	56,312	56,312	56,312	56,312	56,312	56,312	
Training	2,100	3,900	-	-	-	-	-	-	-	-	
Project Supervision	1,700	1,100	800	800	800	800	800	800	800	800	
Administration	1,400	1,500									
Field Engineers Services	-	2,000	2,000								
Total ISA Cost	76,803	64,812	59,112	57,112	57,112	57,112	57,112	57,112	57,112	57,112	
Discount Factor	-	-	-	-	-	-	-	-	-	-	
Present Value of Total ISA Cost	67,356	49,840	39,900	165,282							322,378
Total Incremental Benefits		272,000	306,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000	
Total Incremental Prod. Cost	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700	
Net Incremental Prod. Benefits	-	144,470	164,300	198,300	198,300	198,300	198,300	198,300	198,300	198,300	
Present Value of Net Incremental Benefits	-	111,097	126,346	573,880							811,323
B/C											2.51
Net Incremental Benefits	-76,803	79,658	105,188	141,188	141,188	141,188	141,188	141,188	141,188	141,188	

$$IRR = 1 + \frac{.3\ (12170)}{12170 + 660} = 1 + \frac{3651}{12830} = 128\%$$

ANNEX H
Exhibit 2-d(4)

AMBILAY, CAPIZ - 40 Has.

IRRIGATION PACKAGE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
Construction	31,867	-	-	-	-	-	-	-	-	-
Operation & Maintenance	-	29,543	29,543	29,543	29,543	29,543	29,543	29,543	29,543	29,543
Training	840	1,560	-	-	-	-	-	-	-	-
Project Supervision	680	440	320	320	320	320	320	320	320	320
Administration	560	600	-	-	-	-	-	-	-	-
Field Engineers Services	-	800	800	-	-	-	-	-	-	-
Total ISA Cost	33,947	32,943	30,663	29,863	29,863	29,863	29,863	29,863	29,863	29,863
Discount Factor at 14%	.877	.769	.675							
Present Value of ISA Cost	29,772	25,333	20,698							
Total Incremental Benefits		108,800	122,400	136,000	136,000	136,000	136,000	136,000	136,000	136,000
Total Incremental Prod. Cost	-	51,012	56,680	56,680	56,680	56,680	56,680	56,680	56,680	56,680
Net Incremental Production Benefits	-	57,788	65,720	79,320	79,320	79,320	79,320	79,320	79,320	79,320
Present Value of Net Incremental Benefits	-	44,439	44,361							
B/C										1.96
Net Incremental Benefits	-33,947	24,845	35,057	49,457	49,457	49,457	49,457	49,457	49,457	49,457

IRR = $.8 + \frac{2\ (5068\ )}{5068 + 247} = .81\ \frac{1013.6}{5315} = .8 + .19 = 99\%$

ANNEX H
Exhibit 2-d(5)

16-2

AGKILO, CAPIZ - 100 Has.

IRRIGATION PACKAGE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
Construction	52,250	-	-	-	-	-	-	-	-	-
Operation & Maintenance	-	44,459	44,459	44,459	44,459	44,459	44,459	44,459	44,459	44,459
Training	2,100	3,900	-	-	-	-	-	-	-	-
Project Supervision	1,700	1,100	800	800	800	800	800	800	800	800
Administration	1,400	1,500	-	-	-	-	-	-	-	-
Field Engineers Services	-	2,000	2,000	-	-	-	-	-	-	-
Total ISA Cost	57,450	52,959	47,259	45,259	45,259	45,259	45,259	45,259	45,259	45,259
Discount Factor at 14%	.877	.769	.675							
Present Value of Total ISA Cost	50,384	40,726	31,900							
Total Incremental Benefits	-	272,000	506,000	340,000	340,000	340,000	340,000	340,000	340,000	340,000
Total Incremental Production Cost	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700
Net Incremental Production Benefits	-	144,470	164,300	198,300	198,300	198,300	198,300	198,300	198,300	198,300
B/C										3.19
Net Incremental Benefits	-57,450	91,511	117,041	153,041	153,041	153,041	153,041	153,041	153,041	153,041

$$IRR = 1.5 + \frac{.5\ (5497)}{5497 + 1814} = 1.5 + \frac{2748.5}{7311} = 1.5 + 38 = 188\%$$

ANNEX H
Exhibit 2-d(6

PASUGUE, CAPIZ - 80 Has.

IRRIGATION PACKAGE

YEAR

	1	2	3	4	5	6	7	8	9	10
Construction	49,967	-	-	-	-	-	-	-	-	-
Operation & Maintenance	-	59,485	59,485	59,485	59,485	59,485	59,485	59,485	59,485	59,485
Training	-	1,680	3.170	-	-	-	-	-	-	-
Project Supervision	-	1,360	880	640	640	640	640	640	640	640
Administration	-	1,120	1,200	-	-	-	-	-	-	-
Field Engineers Services	-	1,600	1,600	-	-	-	-	-	-	-
Total ISA Cost	49,967	62,245	66,285	60,125	60,125	60,125	60,125	60,125	60,125	60,125
Discount Factor at 14%	.877	.769	.675	.592	.519	.846	.846	.846	.846	.846
Present Value of Total ISA Cost	43,821	50,173	44,742							
Total Incremental Benefits	-	217,600	244,800	272,000	272,000	272,000	272,000	272,000	272,000	272,000
Total Incremental Production Cost	-	102,024	113,360	113,360	113,360	113,360	113,360	113,360	113,360	113,360
Net Incremental Production Benefits	-	115,576	131,440	158,640	158,640	158,640	158,640	158,640	158,640	158,640
Present Value of Net Incremental Benefits	-	88,878	88,722							
B/C										2.04
Net Incremental Benefits	-49,967	50,331	65,155	98,515	98,515	98,515	98,515	98,515	98,515	98,515

$$IRR = 1 + \frac{.5\ (7961)}{7961 + 3664} = 134\%$$

113

ANNEX H
Exhibit 2-d(7)

TYPICAL PUMPING SET INSTALLATION COST

PROVINCE: CAPIZ
NAME OF ISA

	AMBILAY, PANITAN 40 Ha.	ILAYA-ILAWOD, MAYON 80 Ha.	SALOCON, PANITAN 80 Ha.	AGKILO, CONCIENCIA 100 Ha.	PASUGUE, PANITAN 80 Ha.	TOTALS 380 Ha.
MATERIALS						
Pump and Motor Foundation	₱ 809.00	₱ 857.00	₱ 727.00	₱ 713.00	₱ 1,547.00	₱ 4,653.00
Pump House	662.35	799.90	1,677.70	500.18	677.35	4,317.48
Pump Sump and Channel	471.00	746.00	738.50	734.50	738.50	3,428.50
Stilling Pool	404.50	537.00	553.62	404.50	522.30	2,421.92
Canal Structures	1,365.50	2,333.50	2,828.00	4,798.10	1,605.50	12,930.60
Pumping Unit	16,623.30	50,087.75	44,806.10	35,012.25	36,162.30	182,691.70
LABOR						
Topographic Survey	1,200.00	3,000.00	2,970.00	3,000.00	600.00	10,770.00
Pump and Motor Foundation	276.00	430.00	368.00	318.00	276.00	1,668.00
Pump House	124.00	444.00	248.00	140.00	124.00	1,080.00
Pump Sump	124.00	310.00	186.00	52.00	124.00	796.00
Stilling Pool	124.00	186.00	156.00	185.00	138.00	789.00
Road Crossing	344.00	430.00	688.00	980.00	344.00	2,786.00
Canalization	6,970.88	5,749.50	3,177.02	1,252.00	3,382.00	20,531.40
Pumping Unit	270.00	320.00	896.12	622.00	262.00	2,370.12
Transport Cost	581.00	1,853.40	1,344.18	1,050.37	1,084.87	5,913.82
CONTINGENCIES	1,517.47	3,518.94	3,010.76	2,488.10	2,379.38	12,914.65
TOTALS	₱31,867.00	₱71,603.00	₱64,375.00	₱52,250.00	₱49,967.00	₱270,062.00

ANNEX II
Exhibit 2-d(8)

ANNEX H
Exhibit 3

SENSITIVITY ANALYSIS

LENGTHENING OF CONSTRUCTION FOR ONE MORE YEAR

3-a(1)

YEAR	NET INCREMENTAL BENEFITS			TOTAL
	Irrigation	Production	Marketing	
1	- 20,800			- 20,800
2	- 298,637	- 21,200		- 319,837
3	306,661	- 129,600	- 6,800	170,261
4	393,981	119,440	- 208,800	304,621
5	529,981	149,600	188,160	867,741
6	529,981	217,600	224,560	972,141
7	529,981	217,600	277,200	1,024,781
8	529,981	217,600	277,200	1,024,781
9	529,981	217,600	277,200	1,024,781
10	529,981	217,600	277,200	1,024,781

IRR = 111%

TOTAL ISA COSTS
INCREASE AND DECREASE OF 10% PALAY YIELD
INCREASE AND DECREASE OF 10% PALAY PRICE

I R R

	1	2	3	4	5	6	7	8	9	10
FABRICA II (100 Has.)										
Irrigation	67,830	75,942-	70,242	68,242	68,242	68,242	68,242	68,242	68,242	68,242
Production	-	36,300-	22,200	21,000	20,808	20,808	20,808	20,808	20,808	20,808
Marketing	-	-	57,200	22,300	21,700	21,700	21,700	21,700	21,700	21,700
FABRICA III (100 Has.)										
Irrigation	67,830	75,942-	70,242	68,242	68,242	68,242	68,242	68,242	68,242	68,242
Production	-	36,300	22,200	21,000	20,800	20,800	20,800	20,800	20,800	20,800
Marketing	-	-	59,200	22,300	21,700	21,700	21,700	21,700	21,700	21,700
SAN VICENTE (50 Has.)										
Production	-	18,150-	11,100	10,530	10,400	10,400	10,400	10,400	10,400	10,400
Marketing	-	-	26,600	11,150	10,850	10,850	10,850	10,850	10,850	10,850
Irrigation	54,549-	52,330	49,480	48,480	48,480	48,480	48,480	48,400	48,400	48,400
STO. DOMINGO (50 Has.)										
Production	-	18,150-	11,100	10,500	10,400	10,400	10,400	10,400	10,400	10,400
Marketing	-	-	26,600	11,150	10,850	10,850	10,850	10,850	10,850	10,580
Irrigation	65,495	67,969-	62,269	60,269	60,269	60,269	60,269	60,269	60,269	60,269
UPPER BUBUATAN (100 Has.)										
Production	-	36,300-	22,200	21,000	20,800	20,800	20,800	20,800	20,800	20,800
Marketing	-	-	53,200	22,300	21,700	21,700	21,700	21,700	21,700	21,700
T O T A L	285,437-	439,219	572,819	436,419	433,219	433,219	433,219	433,219	433,219	433,219

10% DECREASE IN PALAY YIELD
100 HAS

	YEAR									
	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	244,800	275,400	306,000	306,000	306,000	306,000	306 000	306,00	306,000
TIP Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700
NIP Benefits	-	117,270	133,700	164,300	164,300	164,300	164,300	164,300	164,300	164,300
PRODUCTION										
TIP Benefits	-	-	122,400	137,700	153,000	153,000	153,000	153,000	153,000	153,000
TIP Costs	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600
NIP Benefits	-	-	37,260	43,100	58,400	58,400	58,400	58,400	58,400	58,400
MARKETING										
TIP Benefits	-	-	-	97,440	109,620	121,800	121,800	121,800	121,800	121,800
TIP Costs	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600
NIP Benefits	-	-	-	60,900	69,020	81,200	81,200	81,200	81,200	81,200
TOTAL NIP	-	117,270	170,960	241,420	261,480	270,300	270,300	270,300	270,300	270,300
TOTAL FOR 3 ISAs	-	351,810	512,880	804,900	875,160	911,700	911,700	911,700	911,700	911,700

Legend:

TIP - Total Incremental Production
NIP - Net Incremental Production

ANNEX H
Exhibit 3-b (1)

891

ANNEX II
Exhibit 3-b(2)

10% DECREASE IN PALM YIELD
50 HAS.

	YEAR									
	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	122,400	137,700	153,000	153,000	153,000	153,000	153,000	153,000	153,000
TIP Costs	-	63,765	70,850	70,850	70,850	70,850	70,850	70,850	70,850	70,850
NIP Benefits	-	58,635	66,850	82,150	82,150	82,150	82,150	82,150	82,150	82,150
PRODUCTION										
TIP Benefits	-	-	61,200	68,850	76,500	76,500	76,500	76,500	76,500	76,500
TIP Costs	-	-	42,570	47,300	47,300	47,300	47,300	47,300	47,300	47,300
NIP Benefits	-	-	18,630	21,550	29,200	29,200	29,200	29,200	29,200	29,200
MARKETING										
TIP Benefits	-	-	-	48,720	54,810	60,900	60,900	60,900	60,900	60,900
TIP Costs	-	-	-	18,270	20,300	20,300	20,300	20,300	20,300	20,300
NIP Benefits	-	-	-	30,450	34,510	40,600	40,600	40,600	40,600	40,600
TOTAL NIP	-	58,635	85,480	120,710	130,740	130,740	135,150	135,150	135,150	135,150
TOTAL FOR 2 ISAs	-	117,270	170,960	268,300	291,720	303,900	303,900	303,900	303,900	303,900
TOTAL FOR 5 ISAs	-	469,080	683,840	1,073,200	1,166,880	1,215,600	1,215,600	1,215,600	1,215,600	1,215,600
NET INCREMENTAL BENEFITS	-285,437	29,864	111,021	636,781	733,661	782,381	782,381	782,381	782,381	782,381

IRR = 86.80%

100 Hectares

10% INCREASE IN PALAY YIELDS

	YEAR									
	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	299,200	336,600	374,000	374,000	374,000	374,000	374,400	374,000	374,000
TIP Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700
NIP Benefits	-	171,670	194,900	232,300	232,300	232,300	232,300	232,300	232,300	232,300
PRODUCTION										
TIP Benefits	-	-	149,600	168,300	187,000	187,000	187,000	187,000	187,000	187,000
TIP Costs	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600
NIP Benefits	-	-	64,460	73,700	92,400	92,400	92,400	92,400	92,400	92,400
MARKETING										
TIP Benefits	-	-	-	113,120	127,260	141,400	141,400	141,400	141,400	141,400
TIP Costs	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600
NIP Benefits	-	-	-	76,580	86,660	100,800	100,800	100,800	100,800	100,800
Total for 3 ISAs	-	515,010	778,080	1,147,740	1,234,080	1,276,500	1,276,500	1,276,500	1,276,500	1,276,500
Total for 5 ISAs	-	686,540	1,037,440	1,530,320	1,645,440	1,702,000	1,702,000	1,702,000	1,702,000	1,702,000
Net Incremental Benefits	-285,437	247,321	464,621	1,093,901	1,212,221	1,268,781	1,268,781	1,268,781	1,268,781	1,268,781

$$IRR = 150 + 10 \left(\frac{3,738.45}{9,760.08} \right) = 150 + 10\ (.38)$$

$$= 150 + 3.80$$

$$= \underline{153.80\%}$$

ANNEX H
Exhibit 3-

6/9

170

50 Hectares

10% INCREASE IN PALAY YIELDS

YEAR

	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	149,600	168,300	187,000	187,000	187,000	187,000	187,000	187,000	187,000
TIP Costs	-	63,765	70,850	70,850	70,850	70,850	70,850	70,850	79,850	70,850
NIP Benefits	-	85,235	97,450	116,150	116,150	116,150	116,150	116,150	116,150	116,150
PRODUCTION										
TIP Benefits	-	-	74,800	84,150	93,500	93,500	93,500	93,500	93,500	93,500
TIP Costs	-	-	42,570	47,300	47,300	47,300	47,300	47,300	47,300	47,300
NIP Benefits	-	-	32,230	26,850	46,200	46,200	46,200	46,200	46,200	46,200
MARKETING										
TIP Benefits	-	-	-	56,560	63,630	70,700	70,700	70,700	70,700	70,700
TIP Costs	-	-	-	18,270	20,300	20,300	20,300	20,300	20,300	20,300
NIP Benefits	-	-	-	38,290	43,330	50,400	50,400	50,400	50,400	50,400
TOTAL FOR 2 ISAs	-	171,530	259,360	382,580	411,360	425,500	425,500	425,500	425,500	425,500

Legend:

TIP - Total Incremental Production
NIP - Net Incremental Production

ANNEX H
Exhibit 3-c(2)

100 Hectares

INCREASE OF 10% PALAY PRICE

YEAR

	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	299,200	336,600	374,000	374,000	374,000	374,000	374,000	374,000	374,000
TIP Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700
NIP Benefits	-	171,670	194,900	232,300	232,300	232,300	232,300	232,300	232,300	232,300
PRODUCTION										
TIP Benefits	-	-	149,600	168,300	187,000	187,000	187,000	187,000	187,000	187,000
TIP Costs	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600
NIP Benefits	-	-	64,460	73,700	92,400	92,400	92,400	92,400	92,400	92,400
MARKETING										
TIP Benefits	-	-	-	113,120	127,260	141,400	141,400	141,400	141,400	141,400
TIP Costs	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600
NIP Benefits	-	-	-	79,580	86,660	100,800	100,800	100,800	100,800	100,800
TOTAL FOR THREE (3) ISAs	-	515,010	778,080	1,147,740	1,234,080	1,276,500	1,276,500	1,276,500	1,276,500	1,276,500

IRR = 153.80%

ANNEX II
Exhibit 3-d(1)

72

50 Hectares

INCREASE OF 10% PALAY PRICE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	149,600	168,300	187,000	187,000	187,000	187,000	187,000	187,000	187,000
TIP Costs	-	63,765	70,850	70,850	70,850	70,850	70,850	70,850	70,850	70,850
NIP Benefits	-	85,835	97,450	116,150	116,150	116,150	116,150	116,150	116,150	116,150
PRODUCTION										
TIP Benefits	-	-	74,800	84,150	93,500	93,500	93,500	93,500	93,500	93,500
TIP Costs	-	-	42,570	47,300	47,300	47,300	47,300	47,300	47,300	47,300
NIP Benefits	-	-	32,230	36,850	46,200	46,200	46,200	46,200	46,200	46,200
MARKETING										
TIP Benefits	-	-	-	56,560	63,630	70,700	70,700	70,700	70,700	70,700
TIP Costs	-	-	-	18,270	20,300	20,300	20,300	20,300	20,300	20,300
NIP Benefits	-	-	-	38,290	43,330	50,400	50,400	50,400	50,400	50,400
TOTAL for 2 ISAs	-	171,670	259,360	382,580	411,360	425,500	425,500	425,500	425,500	425,500
TOTAL For 5 ISAs	-	686,660	1,037,440	1,530,320	1,645,440	1,702,000	1,702,000	1,702,000	1,702,000	1,702,000

Legend:

TIP - Total Incremental Production
NIP - Net Incremental Production

ANNEX II
Exhibit 3-d(2)

200 Has.

10% DECREASE IN PALAY PRICE

YEAR

	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	244,800	275,400	306,000	306,000	306,000	306,000	306,000	306,000	306,000
TIP Costs	-	127,530	141,700	141,700	141,700	141,700	141,700	141,700	141,700	141,700
NIP Benefits	-	117,270	133,700	164,300	164,300	164,300	164,300	164,300	164,300	164,300
PRODUCTION										
TIP Benefits	-	-	122,400	137,700	153,000	153,000	153,000	153,000	153,000	153,000
TIP Costs	-	-	85,140	94,600	94,600	94,600	94,600	94,600	94,600	94,600
NIP Benefits	-	-	37,260	43,100	58,400	58,400	58,400	58,400	58,400	58,400
MARKETING										
TIP Benefits	-	-	-	97,440	109,620	121,800	121,800	121,800	121,800	121,800
TIP Costs	-	-	-	36,540	40,600	40,600	40,600	40,600	40,600	40,600
NIP Benefits	-	-	-	60,900	69,020	81,200	81,200	81,200	81,200	81,200
TOTAL FOR 1 ISA	-	117,270	170,960	241,420	261,480	270,300	270,300	270,300	270,300	270,300
TOTAL FOR 3 ISAs	-	351,810	512,880	804,900	375,160	911,700	911,700	911,700	911,700	911,700

Legend:

TIP - Total Incremental Production
NIP - Net Incremental Production

174

50 Has.

10% DECREASE IN PALAY PRICE

	YEAR									
	1	2	3	4	5	6	7	8	9	10
IRRIGATION										
TIP Benefits	-	122,400	137,700	153,000	153,000	153,000	153,000	153,000	153,000	153,000
TIP Costs	-	63,765	70,860	70,860	70,860	70,860	70,860	70,860	70,860	70,860
NIP Benefits	-	58,635	66,850	82,150	82,150	82,150	82,150	82,150	82,150	82,150
PRODUCTION										
TIP Benefits	-	-	61,200	68,850	76,500	76,500	76,500	76,500	76,500	76,500
TIP Cost	-	-	42,570	47,300	47,300	47,300	47,300	47,300	47,300	47,300
NIP Benefits	-	-	18,630	21,550	29,200	29,200	29,200	29,200	29,200	29,200
MARKETING										
TIP Benefits	-	-	-	48,720	54,810	60,900	60,900	60,900	60,900	60,900
TIP Costs	-	-	-	18,270	20,300	20,300	20,300	20,300	20,300	20,300
NIP Benefits	-	-	-	30,450	34,510	40,600	40,600	40,600	40,600	40,600
TOTAL FOR 2 ISAs	-	117,270	170,960	268,300	291,720	303,900	303,900	303,900	303,900	303,900
TOTAL FOR 5 ISAs	-	469,080	683,840	1,073,200	1,166,880	1,215,600	1,215,600	1,215,600	1,215,600	1,215,600
TOTAL NET INCREMENTAL BENEFITS	-285,437	29,861	111,021	636,781	733,661	782,381	782,381	782,381	782,381	782,381

IRR = 86.80 %

LEGEND:

TIP - Total Incremental Production
NIP - Net Incremental Production

ANNEX H
Exhibit 3-e(2)

ANNEX II
EXHIBIT 3-f(1)

20% INCREASE IN CONSTRUCTION COST
TOTAL ISA COSTS

	YEAR									
	1	2	3	4	5	6	7	8	9	10
FABRICA II										
Irrigation	80,356	75,942	70,242	68,242	68,242	68,242	68,242	68,242	68,242	68,242
Production	-	42,500	22,200	21,000	20,800	20,800	20,800	20,800	20,800	20,800
Marketing	-	-	63,500	22,300	21,750	21,750	21,750	21,750	21,750	21,750
FABRICA III										
Irrigation	80,356	75,942	70,742	68,242	62,242	62,242	62,242	62,242	62,242	62,242
Production	-	42,500	22,200	21,000	20,8[illegible]	20,800	20,800	20,800	20,800	20,800
Marketing	-		63,500	22,300	21,7[illegible]	21,700	21,700	21,700	21,700	21,700
SAN VICENTE II										
Irrigation	35,160	21,836	18,986	17,986	17,986	17,986	17,986	17,986	17,986	17,986
Production	-	21,250	11,100	10,500	10,400	10,400	10,400	10,400	10,400	10,400
Marketing	-	-	31,750	11,150	10,850	10,850	10,850	10,850	10,850	10,850
STO. DOMINGO										
Irrigation	64,439	52,330	49,480	48,480	48,480	48,480	48,400	48,400	48,400	48,400
Production	-	21,250	11,100	10,500	10,400	10,400	10,400	10,400	10,400	10,400
Marketing	-	-	31,750	[illegible],150	10,850	10,850	10,850	10,850	10,850	10,850
UPPER BUBUATAN										
Irrigation	77,554	67,969	62,269	60,269	60,269	60,269	60,269	60,269	60,269	60,269
Production	-	42,800	22,200	21,000	20,800	20,800	20,800	20,800	20,800	20,800
Marketing	-	-	[illegible],800	22,300	21,700	21,700	21,700	21,700	21,700	21,700
TOTAL	337,865	468,019	614,019	436,419	433,219	433,219	433,219	433,219	433,219	433,219

9/17

FABRICA II :
FABRICA III : 100 Has.
UPPER BUBUATAN :

20% INCREASE IN CONSTRUCTION

STO. DOMINGO :
SAN VICENTE II: = 50 Has.

	YEAR									
	1	2	3	4	5	6	7	8	9	10
NIP BENEFITS										
Irrigation	-	144,470	164,300	198,300	198,300	198,300	198,300	198,300	198,300	198,000
Production	-	-	50,860	58,400	75,600	75,400	75,400	75,400	75,400	75,400
Marketing	-	-	-	68,740	77,840	91,000	91,000	91,000	91,000	91,000
TOTAL	-	144,470	215,160	325,440	351,540	364,700	364,700	364,700	364,700	364,700
TOTAL FOR BISA w/100 HAS.	-	433,410	645,480	976,320	1,054,620	1,094,100	1,094,100	1,094,100	1,094,100	1,094,100
NIP BENEFITS										
Irrigation	-	72,235	82,150	99,150	99,150	99,150	99,150	99,150	99,150	99,150
Production	-	-	25,430	29,208	37,700	37,700	37,700	37,700	37,700	37,700
Marketing	-	-	-	34,370	38,920	45,500	45,500	45,500	45,500	45,500
TOTAL	-	72,235	107,580	162,720	175,770	192,350	192,350	192,350	192,350	192,350
TOTAL For the 2 ISAs w/ 50 Has.	-	144,470	215,160	325,440	351,540	364,700	364,700	364,700	364,700	364,700
TOTAL For the 5 ISAs	-	577,880	860,640	1,301,760	1,406,160	1,458,800	1,458,800	1,458,800	1,458,800	1,458,800
NET Incremental Benefits	-337,865	113,861	246,621	865,341	972,941	1,025,581	1,025,581	1,025,581	1,025,581	1,025,581

$$IRR = 100 + 10\ \frac{(5,896)}{23,759} = 102.48\%$$

ANNEX II
Exhibit 3-f(2)

FARM SUPPORT SYSTEMS

PRODUCTION PACKAGE

To implement the program for increased rice production in the BISA areas, a production package to be introduced into these areas is proposed. This production package consists of the following components:

1. production skills training
2. establishment of institutional linkages
3. adaption of modern farm production inputs
4. establishment of seed production projects
5. utilization of appropriate farm implements
6. provision of facilities for post harvest operations
7. introduction and utilization of marketing facilities

1) Production Skills Training

This training program shall provide the BISA farmer with the necessary knowledge and practical skills for the introduction and maximum utilization of farm production inputs for increased rice production. Among such farm production inputs are fertilizers, insecticides, herbicides, and high quality seeds.

In preparation for this training program, the recruitment of Provincial Training Staffs (PTS) has been conducted in each of the different project sites. They underwent an intensive training course at the University of the Philippines, College of Agriculture at Los Baños, Laguna. The PTS members are responsible for the actual training of the farmers. They also assume the task of planning and coordinating training programs with the different government and private agencies directly and indirectly involved in the FSDC program.

2) Institutional Linkages

The Masagana 99 Program and the agrarian reform program can provide valuable support services to the FSDC Program. The FSDC program in turn can assist the development of these two programs. Thus, institutional linkages with these programs is imperative for complementary assistance.

The Masagana 99 Program can provide resources in the form of farm production inputs (such as fertilizers, seeds, pesticides) financial assistance, extension and other technical support services. The FSDC Program's inherent rice production objective will in turn contribute to the M99's national rice production goals.

The Department of Agricultural Reform can assist the BISA Program through its directories, agrarian counsels and extension support services. The ISAs in turn can serve as potent vehicles for carrying out the agrarian reform program. To accomplish this, the DAR shall set the FSDC areas in the priority unit for the land transfer operations and other programs which can be implemented in these areas.

3) Farm Production Inputs

The following farm production inputs shall be provided in areas covered by the FSDC:

a) High quality seeds: Sources of these are certified seeds which are mass-produced and distributed by the Bureau of Plant Industry of the Dept. of Agriculture. The use of certified seeds is reported to account for a 20% yield increase in rice production.

b) Fertilizers: Commercial fertilizers are available from local companies and from imports. The production, distribution, and/or importation activities of these companies are governed by the Fertilizer Industry Authority. The Government has also established fertilizer price subsidies to assist farm corporations in line with the government's campaign for staple food crop production. Guano (feces of bats) and composting projects are being developed as sources of fertilizers to minimize the dependence on oil-based fertilizer sources. In most Philippine soils, the use of fertilizers amounts for about 30% increase in rice yield.

c) Insecticides: Reports show that insect pests damage rice crop by as much as 60% if left uncontrolled. Chemical insecticides available are in different formulations and brands and range from selective to broad spectrum effects against pests. Recommended insecticides have been formulated by different institutes like the BPI, IRRI, UP College of Agriculture in coordination with chemical companies after having been intensively tested under many varying conditions in the Philippines.

The theoretical and practical skills in insect pest control will be acquired during the training of the ISA members.

d) Herbicides: Weed control significantly affects rice yields by as much as 36%. Herbicides reduce labor cost substantially. These are classified into selective and non-selective types with pre-emergence and post-emergence controlling effect. They are available in granular emulsifiable concentrate and wettable powder formulations. These are available in several brands and with almost all local dealers connected with the rice production program. List price ranges from ₱60 to ₱88 for the amount needed per hectare.

e) Sacks: Durable and clean sacks are important for storage and transport, in order to minimize grain losses and infestation in transport and storage. Sacks available in the market are made up of jute and synthetic materials costing about ₱2.00 per piece.

4) Establishment of seed production projects

Registered seeds of the newly developed varieties shall be acquired from the BPI and other institutions for the production of certified seeds by the ISA members themselves. Seeds produced by ISAs will be sold to farmer-members at a lower cost. It will also assure the members a steady supply of the needed high quality seeds.

5) Farm Implements for Production

The following implements reduce cost of operation and achieve greater efficiency:

a) Rotary weeder: This simple farm implement is made up of wood, toothed metal roller and wood materials and a metal float.

It is used in the field by pushing it 2 to 3 times to obtain satisfactory weeding performance.

Many local manufacturers established shops in many important rice growing areas. The rotary weeder is available at ₱40.00 a piece.

b) Sprayers: The use of sprayer for wettable powder and amulsifiable formulations chemicals is necessary to achieve economy, convenience and uniformity of chemical dispersion for greater efficiency.

Sprayers are available in the market as knapsack, compresse air and power sprayers. Knapsack and compressed air sprayers are manually operated. Power sprayer requires a motor. These are usually imported from Japan, U.S.A., etc. These farm equipments can be obtained from local dealers for the costs ranging from ₱200 or ₱400/unit for sprayers of knapsack and compressed air types.

6) Post harvest operations

The cost of operations for post harvest activities is included in the economic analysis. Post harvest activities shall require machineries like thresher and drier before the grain is marketed or stored in the warehouse.

Machinery such as this shall be provided in the ISA areas to reduce wastage and/or grain losses which usually occur using the traditional equipment.

7) Marketing Facilities

Warehouses and rice mills are important facilities which sho be provided in the ISA areas. These are designed to minimize gr losses, achieve higher profit and effectively implement BISA's market ing scheme. However, the size of these facilities shall depend on the volume of business. Its activities must be coordinated with the National Grains Authority for complementary assistance.

COST FOR COMPLETION OF TERMINAL FACILITIES
(IRRIGATION SYSTEM REHABILITATION)

	COMMON STRUCTURES:	QTY	COST
S1	Combined provincial road crossing and check	1	₱ 2,899.00
S2	Combined RR crossing and check	1	2,679.00
S3	Combined national road crossing and check	1	4,080.00
S4	Combined HDA road crossing and check	1	1,285.00
S5	Combined threshing crossing and Headgate at A & B	2	2,004.00
S6	Turnouts (R)	12	7,674.00
S7	Creek crossing (Siphon)	1	8,316.00
S8	End check	1	1,610.00
	Vertical brop	1	3,780.00
	Measuring device	2	812.00
	Drainage culverts	12	1,200.00
			₱36,339.00

Cost/hectare = 363.39 ₱400/ha

SIPHON

50 pcs. RCP 36" Ø @ 100	- 5,000
40 bags cement @ 16	- 640
8 cu.m. gravel @ 35	- 280
4 cu.m. sand @ 25	- 100
30 pcs RSB @ 20	- 600
Form Lumber 120 bd. ft. @ 2.00	- 240
Contingencies (10% of Total Cost)	- 756
Labor	- 700
	8,316

PROV'L ROAD CROSSING AND CHECK

12 pcs RCP 24"Ø @ 100	- 1,200
20 bags cement @ 16	- 320
6 cu.m. gravel @ 35	- 210
3 cu.m. sand @ 25	- 75
15 pcs. RSB @ 20	- 300
Form Lumber 90 bd. ft. @ 2.00	- 180
Labor	- 350
Contingencies (10% of Total Cost)	- 264
	2,899

NATIONAL ROAD CROSSING AND CHECK

20 pcs. RCP 24"Ø @ 100	- 2,000
28 bags cement @ 16	- 448
7 bags gravel @ 35	- 245
3-1/2 cu.m. sand @ 25	- 88
20 pcs RSB @ 20	- 400
Form Lumber 105 bd. ft. @ 2.00	- 210
Labor	- 350
Contingencies (10% of Total Cost)	- 339
	4,080

RR CROSSING AND CHECK

10 pcs RCP 24"Ø @ 100	- 1,000
All others almost same as PROV'L ROAD CROSSING	- 1,485
Contingencies Cost	- 244
	2,679

DROP VERTICAL

20 RCP - 24"Ø ----	₱ 80.00/ea	- 1,600.00
40 Bags - Cement--	13.50/ea	- 540.00
4 cu. sand ------	30.00	- 120.00
8 cu. m. Gravel--	35.00	- 280.00
50 Pcs of RSB #3/8"Ø-	20.00	- 1,000.00
Bd. Ft. of Lumber ---	120 Bd. Ft.	- 240.00
Total on Materials - ----------		₱3,780.00

Labor

1 Skilled Carpenter	- ₱15.00/day	
1 Skilled Mason - - --	15.00/day	
8 Laborers - - - - - -	9.00/day	
	39.00/day	
	x	
	10 days	
	₱390.00	
Total -		₱ 4,170.00
10% Contingencies - - - - - - - - - - - - - -		417.00
		₱ 4,587.00

Measuring Device (2)

2 pc RSB - 1/2"Ø - 25.00/ea	- ₱50.00	
3 pc RSB - 3/8"Ø - 20.00/ea	- 60.00	
7 bags cement @ 13.50/ea	- 94.50	
2- 3 inches long - 5/8"Ø Bolt w/Std. Washer - 3.00/ea	- 6.00	
Galvanized Aluminum gage 3/8" thick	- 150.00	
	360.00	
Labor	- 46.00	
	₱406.00	

ANNEX I
Exhibit 2 (4)

TURNOUTS - 12 TURNOUT

Cement - 5 bags	- 57.50
Sand - .42 cu.m. 30/cu.m	- 12.60
Gravel-.84 cu.m. 35.00/cu.m.	- 29.40
RSB - 3/8"Ø 2 pc	- 40.00
	139.50
Steel Gate	- 500.00
Lifting Device	- 639.50
	x 12
	₱7,674.00
Say----------	₱8,000.00 for Contingencies

Standard End Check

20 Bags Cement - 13.50/Bag	- 160.00
1.5 cu.m. of sand	- 45.00
300 cu.m. of gravel	- 95.00
50 pcs 3/8"Ø	- 1,000.00
70 Bd. Ft. of Lumber	- 140.00
30 Bd. Ft. of Flash Bd.	- 60.00
	₱1,610.00

HACIENDA ROAD CROSSING

5 pcs RCP 12"Ø @ 80	-	400
10 bags cement @ 16	-	160
3 cu.m. gravel	-	105
1-1/2 cu.m. sand	-	38
10 pcs RSB @ 20	-	200
Form Lumber 50 bd. ft.@2.00	-	100
Labor	-	165
Contingencies (10% of total cost)	-	117
		1,285

Drainage Culvert (2)

6 culverts @ 100 - ₱600 x 2 - 1,200

Headgates Laterals (2)

6 pcs. 12" Ø 100.00/pc	-	600
32 bags cement @ 16	-	512
4 cu.m. sand @ 25	-	100
6 cu.m. sand @ 35	-	210
RSB - 10 pcs @ 20	-	200
Labor	-	200
	₱	1,822
+ 10% Contingencies	-	182
	₱	2,004

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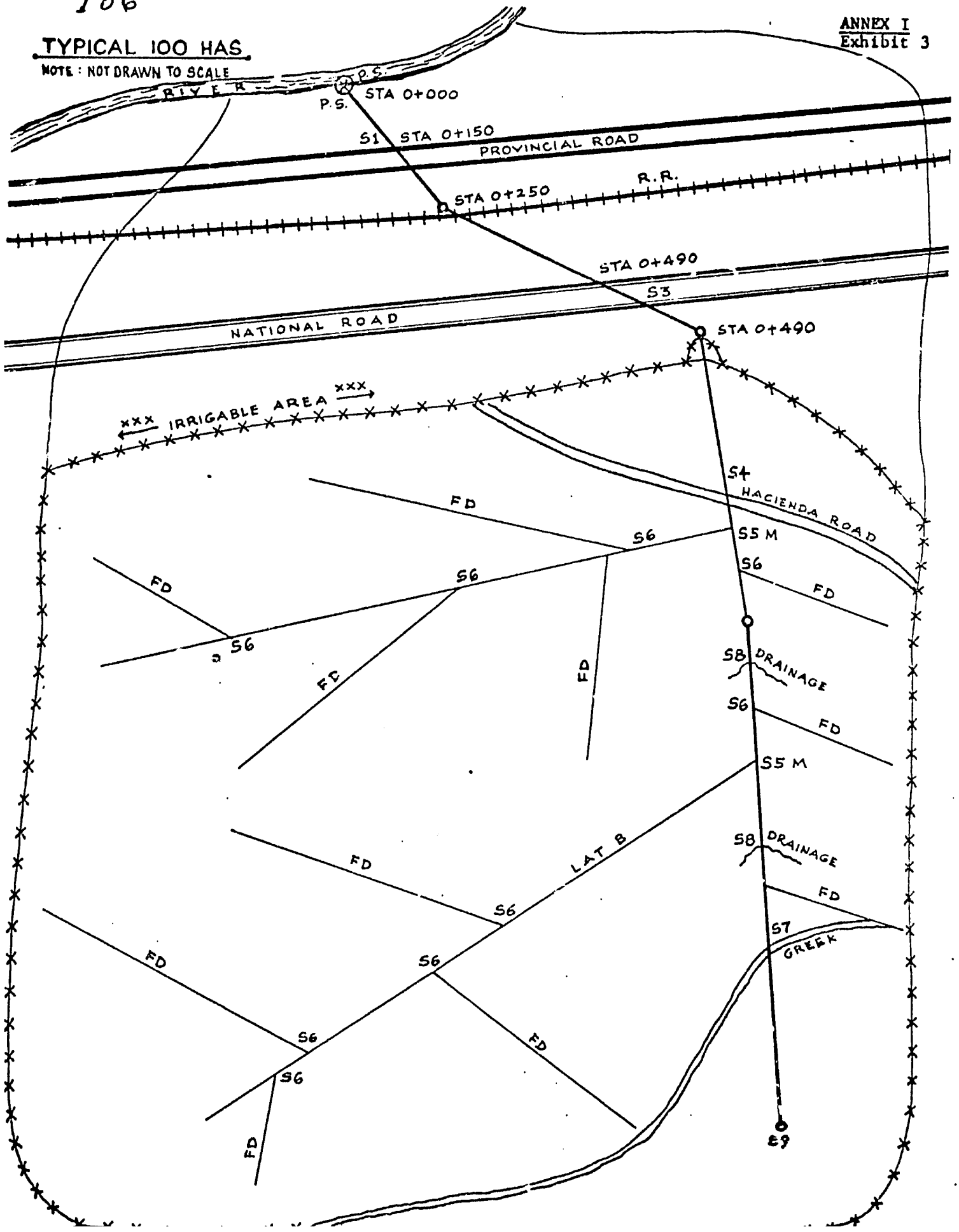
ANNEX I
Exhibit 3

TYPICAL 100 HAS

NOTE : NOT DRAWN TO SCALE



INCREMENTAL NET BENEFITS OF ISA MEMBERS AND ISA EARNINGS

Assumptions: Irrigation Package

Irrigation Fee

2 cropping seasons
100 has.
7 cav/ha/c.s.
₱150/cav.

Administrative Cost

1 office personnel ₱2,880/yr.
₱ 400/yr for office supplies/communication/transportation

Fuel/Oil Consumption

₱.95/liter
3,000 Hrs/yr - running time
(17 hrs/day)
45 H.P. 10" Ø
9.81 liters/hr.

Electric Consumption

₱120/H.P.
₱.18/kw hr.
3,000 Hr/yr - running time
(17 hr/day)
45 H.P. 10" x 3000 GPM
.746 kw/H.P.

Others

Diesel	6,719	- Pump Cost
	39,238	- Engine Cost
	13,000	Accessories
	58,957	- PEA Cost
350/ha.		
	35,000	- Terminal Facilities
100/ha.	10,000	- Pump site Elements
	45,000	
	58,957	- PEA Cost
	103,957	- Irrigation System Construction Cost

1,040/ha.

Others Electric

Pump Cost	6,719
Motor Cost	16,420
Accessories	13,000
PMA Cost	36,139
Terminal Facilities	35,000
Pumpsite Elements	10,000
	45,000
PMA Cost	36,139
Construction Cost	81,139

Assumption: Irrigation Package

Incremental Gross Benefits

See Annex H

1,900/ha. - without irrigation
5,300/ha. - with irrigation
3,400/ha. - incremental gross benefits

Incremental Production Cost

See Annex H

1,180/ha. - without irrigation
2,597/ha. - with irrigation
1,417/ha. - Incremental Production Cost

ANNEX J
Exhibit 1(3)

INCREMENTAL NET BENEFITS OF ISA MEMBERS AND ISA EARNINGS

IRRIGATION PACKAGE	1	2	3	4	5	
DIESEL						
Irrigation Fee 7 cav/ha/c.s.	-	70,000	70,000	70,000	70,000	
Administrative Costs	-	3,280	3,280	3,280	3,280	
Fuel/Oil Consumption Diesel	-	30,754	30,754	30,754	30,754	
Others (Repair, etc.)	-	2,948	2,948	2,948	2,948	
Principal 103,957 loan 1,040/ha. Diesel	20,791	20,791	20,791	20,791	20,791	
Benefits	-20,791	12,227	12,227	12,227	12,227	
Interest 8%	8,317	6,653	4,890	3,327	1,663	
Annual ISA Earnings	-29,108	5,574	7,337	8,900	10,564	
After 5 Yrs ISA Earnings	-29,108	32,375				3,267
Incremental Gross Benefit	-	272,000	306,000	340,000	340,000	
Incremental Prod. Cost	-	127,530	141,700	141,700	141,700	
Irrigation Fee 7 cav/ha/c.s.	-	70,000	70,000	70,000	70,000	
Incremental Net Benefits	-	74,470	94,300	128,300	128,300	
INB/Ha/Yr.	-	745	943	1,283	1,283	
INB/Cav/Ha./Yr.	-	15	19	26	26	
INB/Cav/Ha/Yr/ (6 cav/ha/yr)	-	17	21	28	28	
ELECTRIC						
Irrigation Fee 7 cav/ha/c.s.	-	70,000	70,000	70,000	70,000	
Administrative Costs	-	3,280	3,280	3,280	3,280	
Power Cost Electric	-	23,528	23,528	23,528	23,528	
Others (Repair, etc.)	-	1,807	1,807	1,807	1,807	
Principal 81,139 811/Ha.	16,228	16,228	16,228	16,228	16,228	
Benefits	-16,228	25,157	25,157	25,157	25,157	
Interest 8%	6,491	5,193	3,895	2,596	1,298	
Annual ISA Earnings	-22,719	19,964	21,262	22,561	23,859	
After 5 Yrs. ISA Earnings	-22,719	87,646				64,927
After 5 yrs. ISA Earnings (6 cav/ha/c.s.)	-22,719	47,646				24,927

ANNEX J
Exhibit 1(4)

INCREMENTAL NET BENEFITS OF ISA MEMBERS AND ISA EARNINGS

Assumptions: Production Innovation

Equipment Fee

See Annex H D. Production Cost Assumption
1.20/cavan thresher
.60/cavan dryer

Fuel Consumption

See Annex H B. Production Package

Others

See Annex H B. Production Package

Administrative Costs

See Annex H B. Production Package

Principal

See Annex H B. Production Package
340/ha.
34,000 loan for equipment

Incremental Gross Benefits

See Annex H
5,300/ha. - w/irrigation
7,000/ha. - with production package & irrigation
1,700/ha. - incremental gross benefits

Incremental Production Cost

See Annex H
3,543/ha. - with production package & irrigation
2,597/ha. - with irrigation
946/ha. - incremental production cost

ANNEX J
Exhibit 1(5)

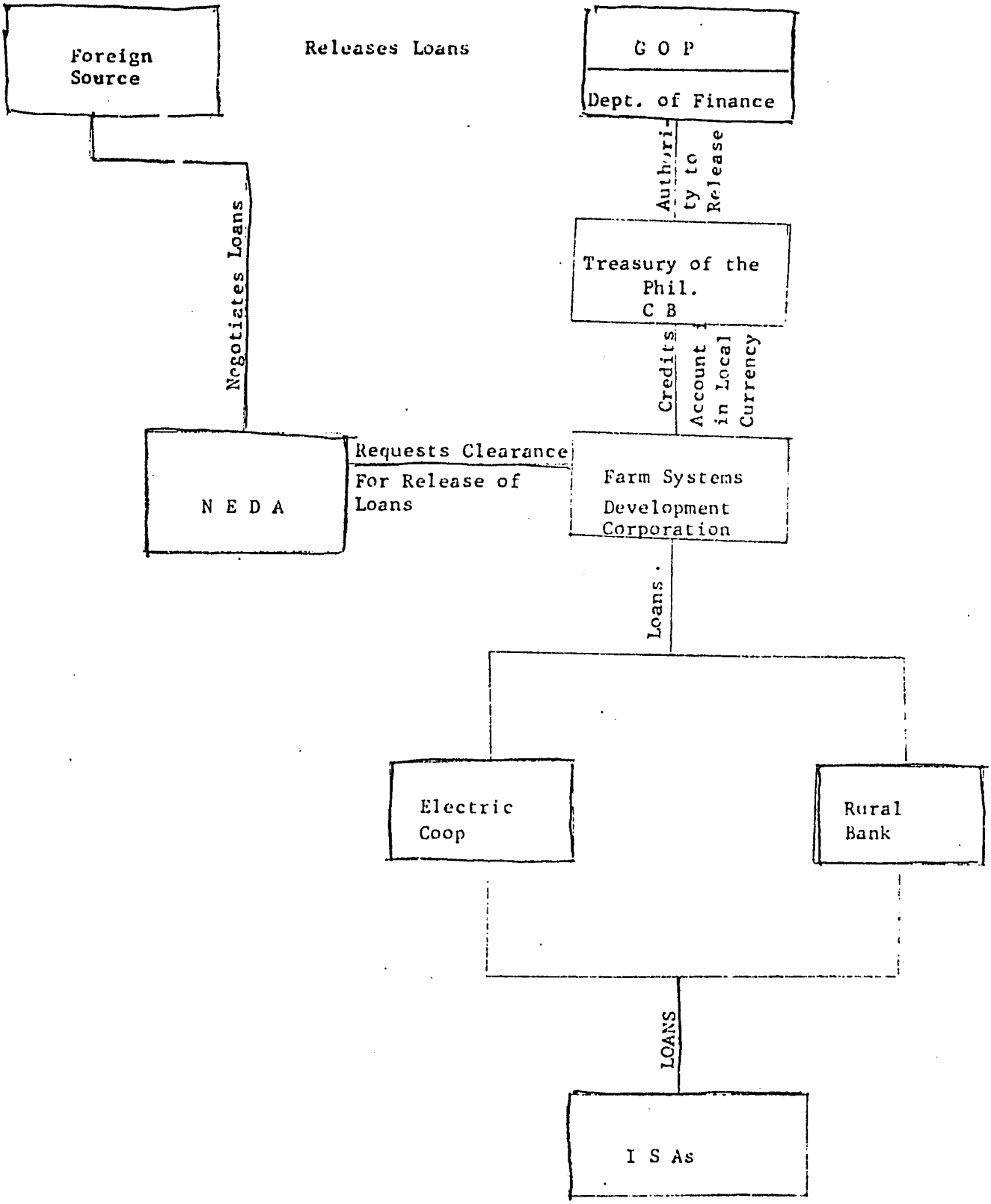
INCREMENTAL NET BENEFITS OF ISA MEMBERS AND ISA EARNINGS

PRODUCTION INNOVATION

	YEAR						
	1	2*	3	4	5	6	
Fee for Use of Equipment	-	-	20,160	22,680	25,200	25,200	
Fuel/Oil Consumption	-	-	3,317	3,317	3,317	3,317	
Others (Repair, etc.)	-	-	1,475	1,475	1,475	1,475	
Administrative Cost	-	-	4,700	4,700	4,700	4,700	
Principal 34,000 Loans	-	6,800	6,800	6,800	6,800	6,800	
Benefits	-	-6,800	3,868	6,388	8,908	8,908	
Interest 8%	-	2,720	2,176	1,632	1,088	544	
Annual ISA Earnings	-	-9,520	1,692	4,756	7,820	8,364	
After 5 Yrs. ISA Earnings	-	-9,520	22,632				13,11
Incremental Gross Benefits	-	-	136,000	153,000	170,000	170,000	
Incremental Production Cost	-	-	85,140	94,600	94,600	94,600	
Fee For Use of Equipment	-	-	20,160	22,680	25,200	25,200	
Incremental Net Benefit	-	-	30,700	35,720	50,200	50,200	
INB/Ha.	-	-	307	357	502	502	
INB/Ha. Cav/Ha/Yr.	-	-	6	7	10	10	

* Start of Production Innovation

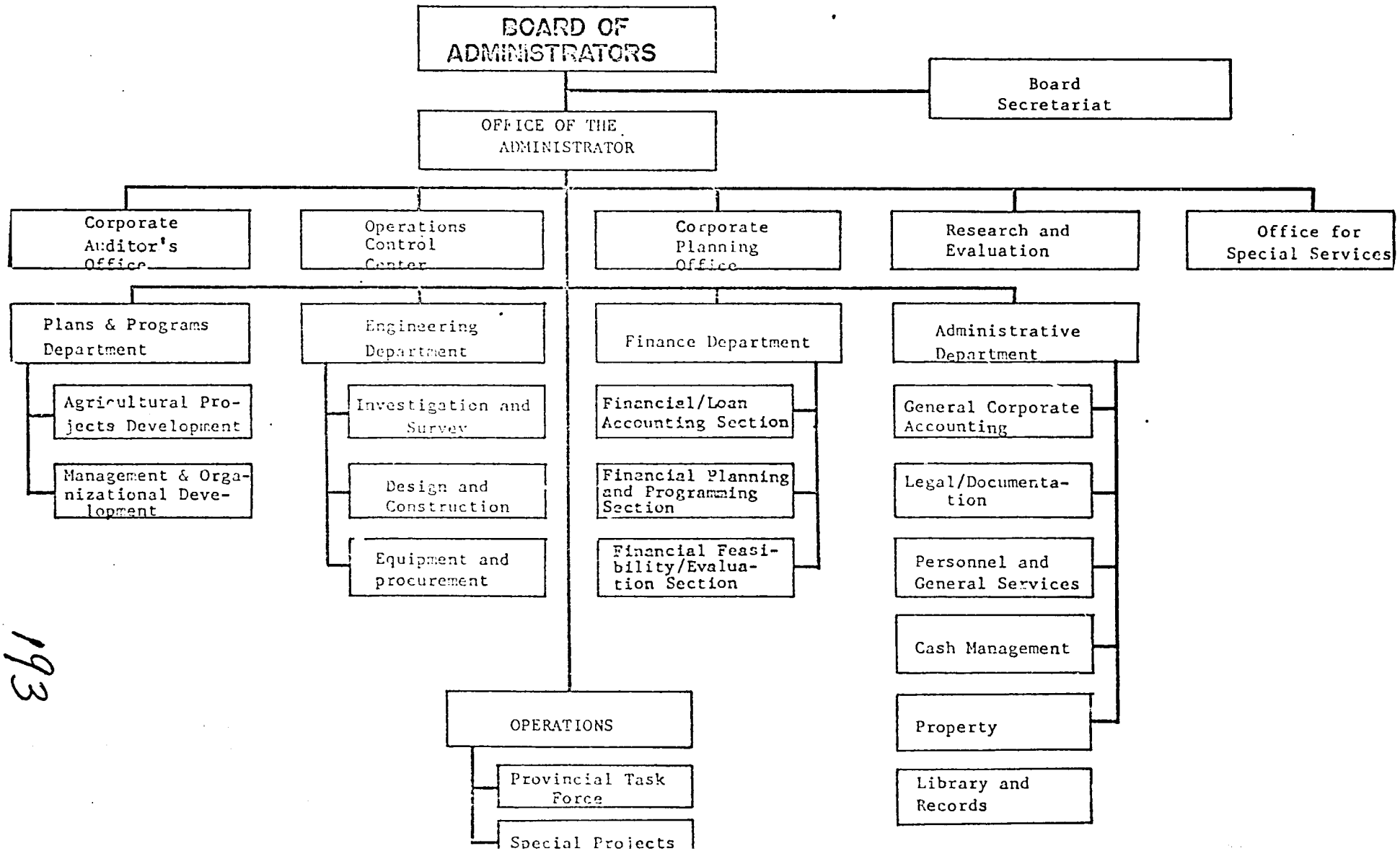
ANNEX J
Exhibit 2



FLOW OF FUNDS FROM BORROWER TO END-USER

FARM SYSTEMS DEVELOPMENT CORPORATION
ORGANIZATIONAL CHART

ANNEX K
Exhibit 1



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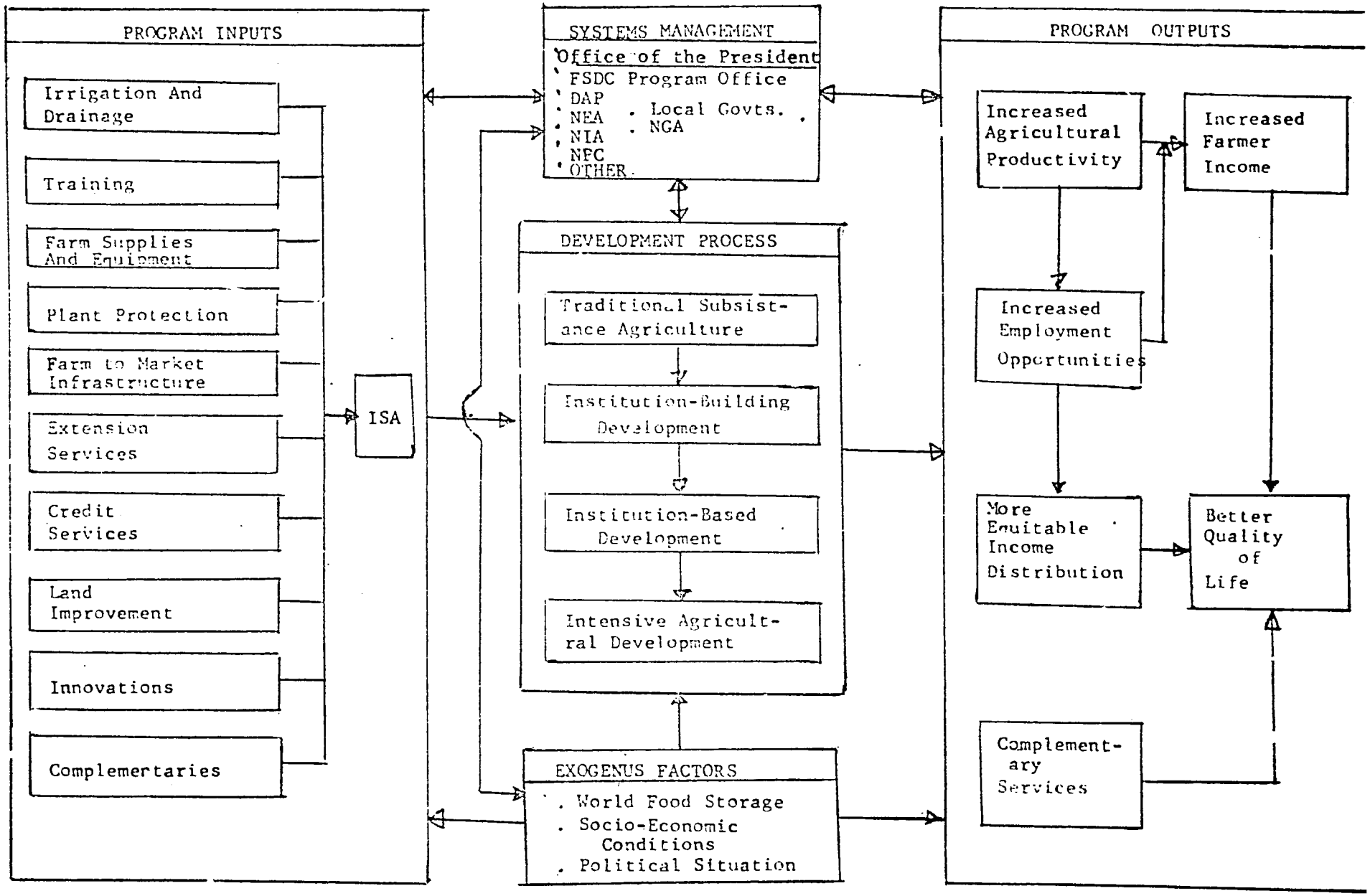
ANNEX K
Exhibit 2

CONCEPTUAL FRAMEWORK
FARM SYSTEMS DEVELOPMENT CORPORATION



F S D C P R O G R A M

PHASE I ACTIVITIES

ACTIVITY	DESCRIPTION	RESPONSIBILITY
1. Project identification	- Determination of possible irrigable areas in targetted provinces	FSDC, NIA, Prov. Gov't.
	- Ocular inspection of identified areas	FSDC, NIA, Prov. Irrig. Engineers; Private Contractors
2. Survey and design	- Topo-survey of proposed service area	FSDC Engineers, NIA, Prov. Irrig. Engineers; Private Contractors
	- Design pumping and water distribution systems	FSDC Designers
	- Estimate construction cost	FSDC Engineers & Designers; Private Contractors
3. Feasibility Study	- Conduct technical, economic and financial feasibility studies	FSDC
4. ISA Organization and registration	- Pre-organizational training	Prov. Irrig. Team (PIT) Mun. Irrig. Team (MIT)
	- Preparation of Articles of Incorporation and By-Laws	Farmers, MIT
	- Registration of association with the SEC	Farmers, MIT, SEC
5. Loan application and	- Application for commodity loan	ISA, FSDC, NEC, Rural Banks

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ANNEX K
Exhibit 3 (1)

FSDC PROGRAM
PHASE I ACTIVITIES

ACTIVITY	DESCRIPTION	RESPONSIBILITY
	- Loan Evaluation	FSDC Evaluators
	- Loan approval	FSDC Board of Administrators
6. Procurement of equipment	- Procurement of pumps and other project equipment requirements	FSDC Engineering
7. Construction	- Construction of pump site structures, water diversion, and distribution systems	FSDC Engineering, NIA Provincial Irrigation Engineers, Private Contractors, ISA Members
8. Extension of power lines	- Extension of power lines to project sites	NEA, REC
9. Installation	- Installation of pump, motor and other required accessories	FSDC Engineering, NIA Provincial Irrigation Engineers; Private contractors
10. Test Run and Operation	- Final testing of pump and water distribution system	FSDC Engineering, REC, NIA Provincial Irrigation Engineers

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ANNEX K
Exhibit 3 (2)

F S D C P R O G R A M

PHASE II ACTIVITIES

ACTIVITY	DESCRIPTION	RESPONSIBILITY
1. Institutional Development	- Conduct training programs for ISA members and officers on:	
	a) Organization and management	PTS, ISA Officers, & Committees
	b) Technical aspects of water management	PTS, Field Engineers, ISA Officers and Committees
	c) Rice production	PTS, ISA members, BPI, BAE
2. Seed Production	- Selection of ISA seed farm	PTS, ISA Board and members
	- Production of certified seeds	ISA Members, BPI
	- Distribution of certified seeds to members	ISA Board, Secretary & Treasurer
3. Installation of Management System	- Introduction of the following institutional services:	
	a) Financing and accounting system	PTS, ISA Management Committee ISA Officers
	b) Organized buying and selling	PTS, ISA Board, ISA Irrigation Management Committee
	c) Institutional loaning system	FSDC, Masagana 99 Program, ISA Board, Secretary and Treasurer

ANNEX K
Exhibit 3 (3)

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F S D C P R O G R A M

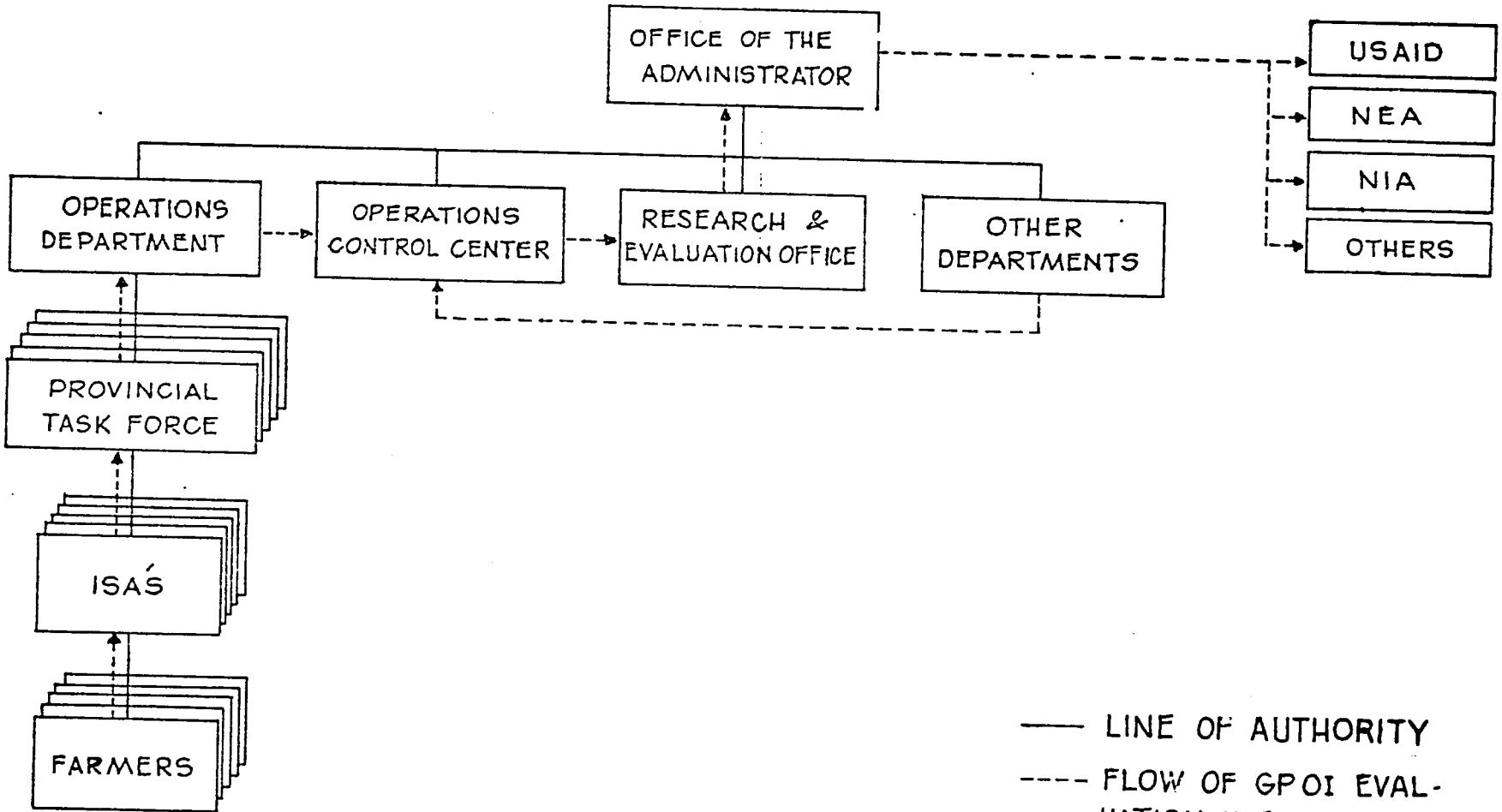
PHASE III ACTIVITIES

ACTIVITY	DESCRIPTION	RESPONSIBILITY
1. Installation of post-harvest facilities and services	- Implement the following farm services:	
	a) farm tool and equipments pool	PTS, FSDC Engineers, ISA Board
	b) common facilities for threshing, drying and intermediate storage	PTS, FSDC Engineers, ISA Board
2. Provision of marketing services	- Implement the following marketing services:	
	a) grading and standardization of products	PTS, FSDC Engineers, ISA Board, NGA
	b) pricing	PTS, ISA Finance Management Committee, & Board, BA Econ., NGA
	c) warehousing, milling and transport services	ISA Board, NGA Truckers
3. Intensification of agricultural production	- Implementation of the following production programs:	
	a) crop diversification, multiple-cropping or crop rotation	PTS, ISA Board and members, BPI, BAE
	b) specialization in certified seed production	PTS, ISA Board and members, BPI, Seed Board

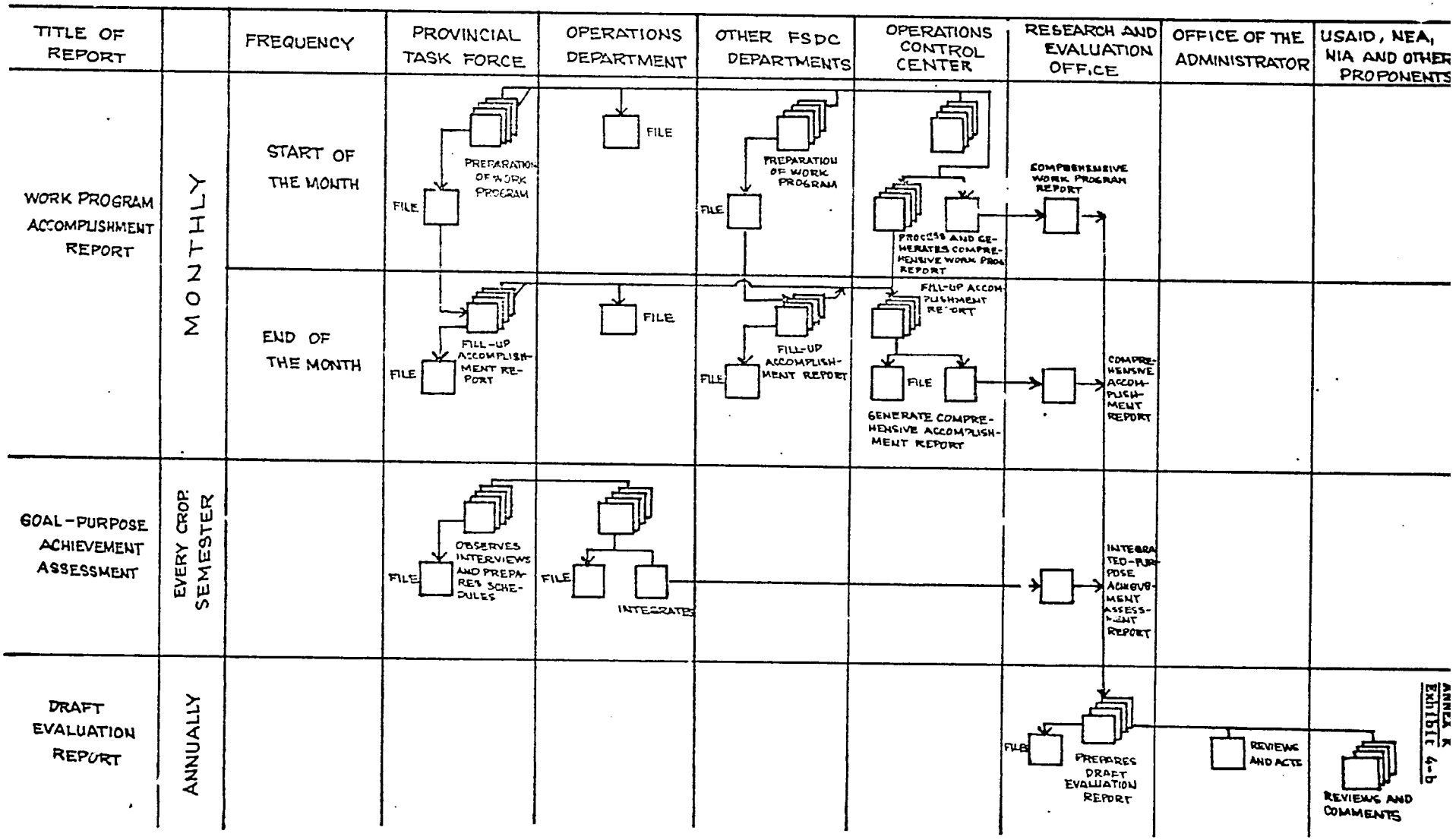
ANNEX K
Exhibit 3 (4)

MONITORING AND REPORTING SYSTEM FOR PROGRAM EVALUATION

INFORMATION FLOW



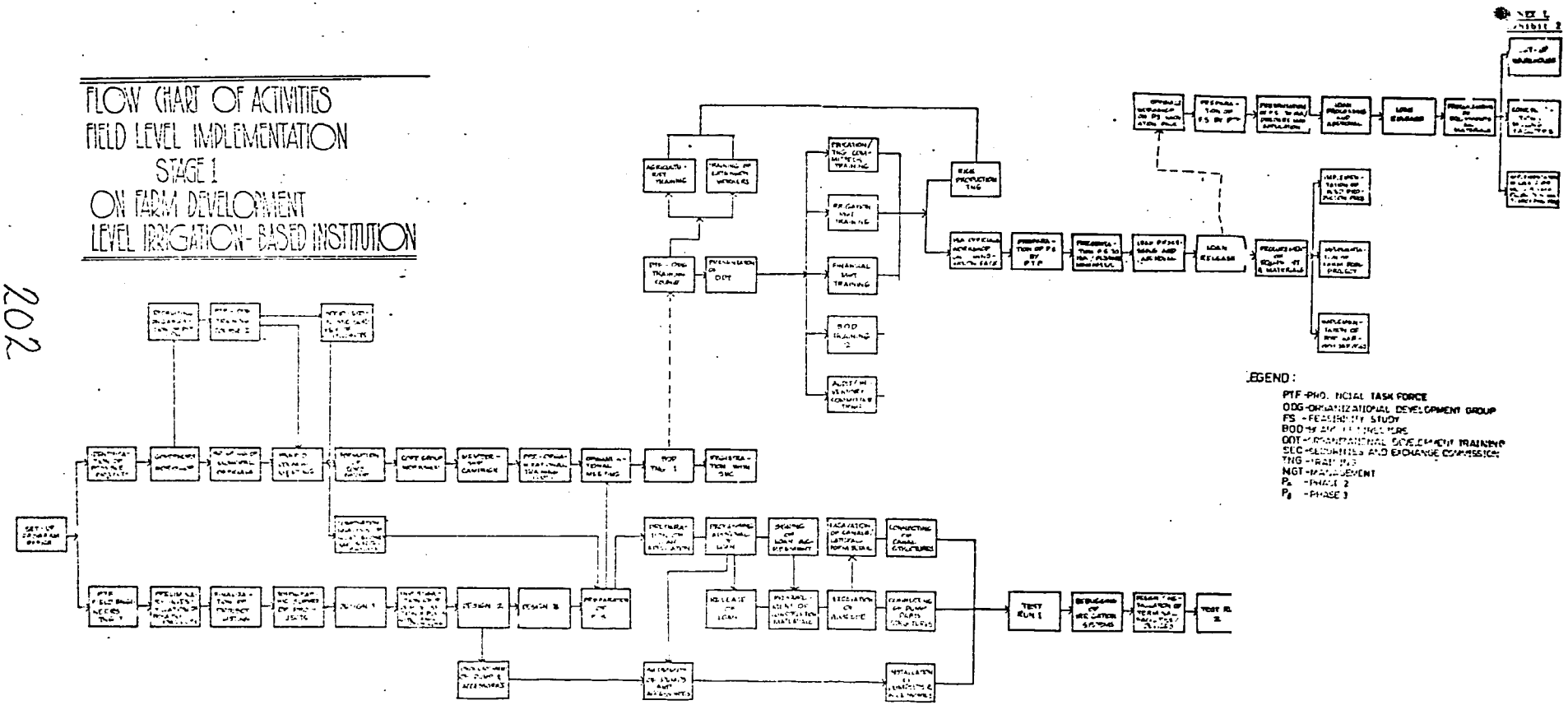
FORMS DISTRIBUTION CHART



FSDC PROGRAM
IMPLEMENTATION PLAN (STAGE I)

ANNEX L
Exhibit I

FLOW CHART OF ACTIVITIES FIELD LEVEL IMPLEMENTATION STAGE I ON FARM DEVELOPMENT LEVEL IRRIGATION-BASED INSTITUTION



LEGEND :

PTF -PHILIPPINE TASK FORCE
ODG-ORGANIZATIONAL DEVELOPMENT GROUP
FS -FEASIBILITY STUDY
BOD-BOARD OF DIRECTORS
OOT-ORGANIZATIONAL DEVELOPMENT TRAINING
SEC-SECURITIES AND EXCHANGE COMMISSION
TNG-TRAINING
MGT-MANAGEMENT
P_2 -PHASE 2
P_3 -PHASE 3

ACTIVITIES FOR STAGE I (APRIL 1975 - JUNE 1978)

PHASE I ACTIVITIES

A. INSTITUTIONAL ACTIVITIES

1. Governors' Workshop/Seminar which orients the provincial governors on the Program's objectives, strategy of implementation and other relevant Program undertakings and solicits provincial counterpart support for Program implementation.

2. Recruitment of Provincial Task Force (PTF) who will be program implementors at the provincial level.

3. PTF organizational development staff training for their tasks and functions.

4. Barrio Council meeting for determining consensus on the project and for orientation.

5. Core group (prospective ISA Board of Directors and Committe Members) recruitment.

6. Core group workshop on the project.

7. ISA membership campaign.

8. Pre-organizational training to orient prospective ISA members

9. ISA organizational meeting and election of Board of Directors (BOD) and other officers.

10. Training of BOD members.

11. Registration of the ISA with the SEC.

B. TECHNICAL ACTIVITIES

1. Preliminary investigation of irrigable areas.

2. Topographic and soil surveys of project areas.

3. First design of irrigation system.

4. River cross-sectioning and canal profiling.

5. Second design of irrigation system.

6. Pumping sets and accessories procurement.

7. Third design of irrigation system.

8. Construction materials negotiation and procurement.

9. Pumpsite structures excavation.

10. Canal network excavation.

11. Pumpsite structures concreting.

12. Pumping sets shipment.

13. Installation of pumping sets.

14. Test-run of irrigation system.

C. FINANCIAL ACTIVITIES

1. Feasibility study preparation.

2. Feasibility presentation to ISA.

3. Loan application.

4. Loan approval.

5. Loan release.

PHASE II ACTIVITIES

A. INSTITUTIONAL ACTIVITIES

1. Provincial Task Force (PTF) for Phase II recruitment.

2. PTF organizational development group training for Phase II.

3. Organizational development training presentation to ISA.

4-6. Irrigation, financial, and organizational management training for ISA Board of Directors, other officers, and committee members.

7. Audit and inventory education and training.

8. Rice production training for ISA members.

9. Selection of pilot areas for first set of innovative packages (IPs[1]) such as seed production and acquisition of farm tools and implements including land tractors, weeders and sprayers.

10. PTF workshop on innovative packages.

11. PTF discussion with BOD on innovative packages.

12. BOD presents IPs[1] to ISA assembly.

13. Pilot scale implementation of IPs.

14. Introduction of IPs[1] for full-scale implementation.

15. Introduction of IPs[1] for full-scale implementation.

16. Full scale implementation of IPs[1].

B. TECHNICAL ACTIVITIES

1. Setting-up of mobile repair support for irrigation systems.

2. Debugging of irrigation systems.

3. Intricate structures design.

4. Intricate structures construction.

5. Installation of intricate structures.

6. Test run of intricate structures.

C. FINANCIAL ACTIVITIES

1. Feasibility study preparation for financing of sub-loans to borrowers on concessional terms for the purchase of small farm tools and implements in the form of weeders and sprayers as well as post-harvest equipment for threshing and drying.

2. FS presentation to ISA.

3. Loan application.

4. Loan approval.

5. Loan release.

PHASE III ACTIVITIES

A. INSTITUTIONAL ACTIVITIES

1. PTF workshop on second set of innovation packages (IPs^2).

2. PTF discussion with BOD on IPs^2.

3. BOD presents IPs^2 to ISA.

4. Pilot scale implementation of IPs^2.

B. TECHNICAL ACTIVITIES

1. Setting-up of support services for the operation and maintenance of the irrigation system.

2. Setting-up of farm equipment and facilities pools.

DEVELOPMENT OF THE ISA

I. Conceptual Framework

The ISA, as designed in the FSDC Program is envisioned to have reached its final stage of development if its three essential components have substantially been realized. These three components and their distinct qualities are the following:

1st component	-	the people component or the organization
2nd component	-	the Irrigation System
3rd component	-	the Financial Stability

1ST COMPONENT:

The Organization

At least fifteen (15) farmers have organized themselves by voluntarily submitting for membership in the ISA. These farmers have the qualifications for membership as described in the ISA By-Laws. They have freely elected five (5) ISA members to compose the Board of Directors and the Auditing Committee. A set of officers composed of the President, Vice-President, Secretary-Treasurer, and a Systems Superintendent have been elected by the Board from among the board members. The Vice-President, the Secretary-Treasurer, and the Systems Superintendent have been designated as the chairman of the Education and Training Committee, the Financial Management Committee and the Irrigation Management Committee, respectively. A Grievance Committee has also been created, the members of which were elected by the general assembly. The five (5) standing committees are composed of one (1) chairman and two (2) members. After organization, the ISA shall have been registered with the SEC.

Strong Membership

The organization has a strong membership. All the members are well-informed about their rights and privileges as well as their duties and obligations to the association and are committed to the objectives of the organization.

The ISA provides a forum for collective decision-making and action. Action is defined as the participation of the general membership in the activities of the association based on the principles of cooperation and mutual responsibility.

Decisions made by the organization are well-supported. Systems and rules laid down for smooth operations are followed. Policies are well-understood. Members pay their irrigation and semestral fees promptly and regularly. Membership is satisfied with and complies with the irrigation scheme.

Membership meetings are well attended. Members are well informed and are involved in the various undertakings of the organization. They can be mobilized into work groups when needed, i. e. - construction crews to work on the irrigation system or as a group of petitioners to represent ISA for negotiations when the need arises.

The members are eager to learn modern and effective irrigation and farm practices. Irrigation has been recognized as economically profitable. This recognition leads to new farm practices being introduced which are suitable to the irrigation scheme being practiced.

Strong Leadership

The Board of Directors and the committees of the ISA are fully functioning and responsive to the needs and problems of the organization. The leaders possess management skills which make them capable of running the organization effectively.

Directions of the organization are clearly established and understood by all members. Common goals are arrived at with consideration of the sentiments of the general membership. Decision-making and problem-solving are conducted in a participative atmosphere.

Resources within the organization as well as external resources (barrio, municipality, provincial, regional, national) are being tapped in meeting the needs of the organization. Coordination among committees is ensured by board meetings. Periodic and informal assessments of the status of the ISA are conducted through meetings which give the organization an opportunity to examine and review the directions pursued by the association.

The Committees

The five standing committees of the ISA ensure the optimal sharing of responsibility in the organization. The Education and Training Committee possesses training skills which make it capable of disseminating information and imparting skills needed in the various undertakings of the association. Its continuing membership education courses keep all members knowledgeable about the objectives, concept, and structure of the ISA. In coordination with the irrigation management committee, it educates the farmer-members on irrigation and farming practices suited to the particular irrigation scheme adopted by the association. This committee coordinates with outside resources who have the expertise needed by the organization - i.e. - farm technicians, irrigation experts, engineers, etc. Through this committee, the members gain access to technical as well as other important information which could contribute to the growth of the organization.

The Auditing and Inventory Committee and the Financial Management Committee coordinate in ensuring that the ISA is in good financial condition. The Financial Management Committee efficiently coordinates the wise allocation of ISA funds while the Audit and Inventory Committee informs the members of the organization's financial status through periodic reports. This of course, presupposes that the committee have a minimum knowledge of accounting, record-keeping, etc. to enable them to function effectively.

The Irrigation Management Committee has enough knowledge in taking care of the smooth operation of the irrigation system. The committee also keeps it well-maintained. This committee has drawn up a workable scheme of distributing adequate amount of water to the farmer-members. Along with this scheme, this committee coordinates with the Education and Training Committee in recommending suitable irrigation farm practices to the farmers. This committee also provides clear policies and procedures which effect efficient irrigation service.

The Grievance Committee provides the channel through which the members impart feedback to the officers concerning ineffective policies, procedures or activities which are detrimental to the welfare of the members. This channel avoids delay of action and consequent loss of morale on the members concerned.

The Organization in relation to the Community

The ISA is recognized as a strong and dynamic grassroots organization. It becomes a catalyst to the economic, political and social growth of the barrio.

Through the organization, the members' potential for leadership are being tapped and this leadership spreads to the community. Economic and social inputs for rural development from the government or private agencies are being channelled through the organization as an entry to the community at large.

Through the ISA, modern and effective farming practices as well as family planning and nutrition practices, etc. are introduced to the community.

2ND COMPONENT:

II. The Irrigation System

A. Physical Set-Up - Visual inspection of the ISA location should reveal the physical structure of an irrigation system.

This is composed of two parts:

1. Water Intake System which consists of the following:

   - pump
   - pipes and accessories (suction and discharge pipes, elbows, foot valve and nipple)
   - pumpsite structures (pump foundation, motor shed, forebay inlet works, stilling pool and pipe supports)

2. Distribution and Conveyance System - which consists of the following:

   - canals (main, lateral, and ditches)
   - canal structures (leadgates, checkgates, turnouts, flumes, siphones, drops and chutes)

B. Implemented Technical Activities

The existence of the physical structure of the irrigation system presupposes that the following technical activities had been accomplished:

1. Feasibility of area as irrigable have been established during the preliminary investigation conducted by the field engineers (F. E.).

2. A topo survey has been conducted by a team led by the FE which produced an accurate topo map. Designs were then drawn based on the topo map. Hence, pump, motor and electrical accessories' specifications were therefore assessed for procurement.

3. Necessary and adequate construction materials have been procured and delivered to the ISA.

4. Excavation work for pumpsite structures and main canal structures (see Physical Set-Up above) have been done by organized ISA members led by the field engineers.

5. Pumps, motor engine, pipes, (electrical) accessories have been released upon approval of the loan and delivered to the ISA organization.

6. Irrigation system equipment have been installed, i. e. fixed in design and places and connections between parts were established.

7. The irrigation system have been subjected to a test run and it works - i e. water could be conveyed from the source to the farm areas in efficient manner.

C. Exposure to Technical Expertise

The ISA makes use of available internal and external resources through which the members gain technical knowledge in the following areas:

1. Water Supply

. The ISA organization should know how to operate and

maintain the irrigation system so that the farmers are adequately supplied with water needed by their farms. Basic operating principles and techniques, maintenance procedures (do's and dont's) and trouble shooting guides should be a part of their expertise.

2. Water Usage

The ISA organization should have access to the following expertise:

a. Water saving measures - i.e. how to conserve water and ensure efficiency of water conveyance to minimize water losses, effective use of rainfall, re-use of waste water, etc.

b. Soil-Water relationship - i.e. on the effect of water on soil quality, how water may control weeds and increase effectivity of fertilizers.

c. Water-Crop Relationship - i.e. on the recommended depth of water for each growth stage of the rice, high-yielding varieties which respond well to water, and the proper cropping schedule for maximum use of land.

3RD COMPONENT

Financial Status

The ISA organization is in a sound financial condition if the fees and dues required from the members as described in its By-Laws are paid on schedule and in the agreed amount or form so that the ISA in turn can pay its yearly loan amortization and other operating expenses.

Prescribed membership fees should have been collected uniformly from all members in cash or its equivalent upon registration of the organization to the SEC.

Irrigation fees in cash or its equivalent paid by members who reclined irrigation services. Payments are made after every harvest. The prescribed irrigation fee have been determined by the Board in consideration of the ISA loan obligations as well as the financial capacity of its members.

Likewise, the agreed amount of semestral fees are paid by all members according to schedule established by the association. Payment of the above fees presupposes a good collection scheme practiced by the ISA. This collection scheme makes possible the members' regular and prompt payment of financial obligation to the organization. This in turn, ensures the ISA's prompt and regular payment of the prescribed amount due yearly for its commodity and financial loan.

However, the organization should also have specific provisions in cases of inability of members to pay due to emergencies and accidents - i.e., floods, earthquakes, and similar calamities.

A communication channel exists between FSDC and the ISA to ensure faster communication, cooperation, and understanding between the two. This communication channel should be recognized by both ISA and the funding agency.

Funds coming from the various fees, contribution, and money-raising activities of the organization should be deposited in the bank. Withdrawals of these funds are made only by the person authorized by the Board of Directors.

III. The Role of the Provincial Training Staff (PTS)

The PTS is responsible for helping the ISA arrive at a stage that has been envisioned in the conceptual framework. As organization developers, their skills in training should strengthen the organizational and the financial components of the ISA and as resource coordinators and project initiators, they should hasten the setting-up and activation of the irrigation system as well as the tapping of the technical expertise available inside and outside of the ISA.

II. INDICATORS OF - ORGANIZATION COMPONENT

- IRRIGATION COMPONENT

- FINANCIAL COMPONENT

ORGANIZATIONAL COMPONENT

A. Indicators on the Organization Stage

1. All officers have been elected

2. Five standing committees have been formed

3. By-laws and Articles of Incorporation approved by members.

4. ISA registered with SEC

5. ISA Office set-up

B. Indicators of Strong Membership

1. 90% of potential members of ISA have actually joined

2. 75% of total membership attending meetings (regular, special)

3. 75% of total membership attending training seminars, continuing education

4. All membership fees paid

5. Semestral dues promptly paid

6. Irrigation fees promptly paid

7. 100% of ISA members sign-up for task or work groups - i.e. construction, excavation crews

8. 80% of ISA work force actually render work

C. Indicators of Board of Directors' Performance

1. 100% attendance in Training for Organizational Skills

2. Program of Activities prepared by President

3. Budget prepared by Secretary/Treasurer.

4. Annual Report prepared by President and Secretary/ Treasurer.

5. Board meets at least once a month.

6. 100% attendance in scheduled meetings of Board of Directors, Committees (quorum).

7. Updated minutes of the meetings held (coordination of various committees, consultations with ISA members).

D. Indicators of Committees' Performance

1. Education and Training Committee.

a. 100% attendance in skills training course for ETC.

b. Program of Activities.

c. Budget, as required.

d. Number of ETC meetings and complete attendance.

e. Established information center.

f. After the training of the ETC, a training activity is conducted at least once a week, with 75% of members' in attendance.

g. Internal resources tapped for education/training purposes.

h. External resources tapped for education/training purposes, i.e. - invitation of irrigation experts, etc.

2. Audit and Inventory Committee

a. Complete attendance in skills training course for auditing and inventory committee.

b. Program of Activities.

c. Budget, as required.

d. A and IC meets once a month with 100% attendance.

e. Prompt and regular quarterly reports of inventory of ISA accounts.

f. Quarterly recommendations submitted to ETC trainir needs of ISA members.

3. Grievance Committee

a. Program of Activities.

b. GC meetings once a week with 100% attendance.

c. Updated records of complaints submitted by ISA members.

d. Updated record of action taken in response to complaints.

e. Actions on complaints taken within a week after each complaint is made.

4. Financial Management Committee

a. 100% attendance in skills training for FMC.

b. Program of Activities.

c. Budget, as required.

d. FMC meets once a month with 100% attendance.

e. Quarterly recommendations for ETC or training needs of ISA members.

f. All financial transactions are recorded in the proper forms (official receipt, cash disbursement voucher, sales invoice, exit of commodities/receipt of commodities forms, up-to-date individual member ledger).

g. Updated summary of the books of accounts have been prepared using the following documents:

(1) Cash Book

(2) Summary of accounts receivable, accounts payable, and loans payable.

(3) Summary of receipt and exit of goods within one month after each harvest.

h. Financial statements are prepared in the following forms

(1) Statement of financial condition.

(2) Statement of assets and liabilities.

i. In coordination with the President, an ISA annual budget based on the committees' proposed budget has been prepared and followed.

j. Quarterly turn-over of financial records to the Audit and Inventory Committees during scheduled audits.

k. Recommendations on prescribed amount of irrigation fees and collection scheme as well as rules, regulations and penalties for delinquent members.

5. Irrigation Management Committee

a. 100% attendance in skills training for IMC.

b. Program of Activities.

c. Budget, as required.

d. IMC once a month with 100% in attendance.

e. Quarterly recommendation to ETC on training needs of ISA members.

f. Policies and procedures on recommended

(1) effective distribution, application and schedule of irrigation.

g. Recommended cost saving measures on irrigation operation.

h. Properly maintained pump sets and costs and structures.

i. Updated layout indicating:

(1) lot of boundaries, canals, canal structure, creeks, roads and trails.

(2) location of turn-outs and checking stations (turnouts - with numbers and names of landowner/tenant).

(3) Drainage problems.

IRRIGATION COMPONENT

A. Indicators on the Construction of the System

1. Water Rights.

2. Record or checklist of construction materials, irrigation equipments delivered to ISA -

- Construction materials
- Pumpset (pump and motor/engine)
- Piping accessories (suction pipe, discharge pipe, elbows, foot valve, nipple)

3. When needed, construction crews composed of ISA members are organized to construct or excavate pumpsite/canal structures.

4. Checklist of pumpsite and canal structures that are constructed.

a. Pumpsite Structures

(1) Pump sump

(2) Pump foundation

(3) Motor/engine foundation

(4) Motor/engine shed

(5) Stilling pool

(6) Pipe supports

b. Canal Structures

(1) Main canal

(2) Lateral canals

(3) Ditches

(4) Headgates

(5) Checkgates

(6) Turnouts

(7) and others

5. Installation of irrigation equipment.

6. Extension of power lines for electrically driven pumps.

7. Successful test run.

B. Indicators of Effective Water Management

1. Operations

a. Effective scheme for Distribution and Application of Irrigation Water.

(1) Adequate or desired amounts of water are actually delivered to farms.

(2) Timely water delivery to meet crop requirements.

(3) Soil is kept in a saturated condition (3 days after transplanting to 2 weeks before harvesting).

(4) Minimal drainage problems (removal of excess water from farms).

(5) Water is kept at tolerable depth of submergence according to stage of rice growth, in accordance with soil type.

(6) Weeds are controlled through effective water use.

(7) Benefits of fertilizer application maximized with appropriate water use.

(8) Scheme is actually followed and practiced by all ISA members.

b. Adoption of suitable rice production pattern corresponding to workable water distribution and application scheme:

(1) Practical - i.e. feasible in consideration of the topography, rainfall, available water supply.

(2) Maximizing land use so that income from farm production is doubled/tripled, etc.

(3) Acceptable to farmers (that is, in consideration of previous cropping pattern and consumption).

c. A prescribed amount of irrigation fee is being collected that:

(1) Can account for the yearly amortization of loans, and for maintenance and operational expenses.

(2) Can be afforded by farmer-member.

(3) Is acceptable to farmers.

(4) Provide for some capital build-up.

d. Operation Costs Saving Measures are being taken such as:

(1) effective utilization of rainfall.

(2) tapping of surplus water or re-use of water.

(3) prevention of conveyance and distribution of water losses.

2. Well-Maintained and Functioning Water Intake, Distribution and Conveyance System.

a. Correct procedures and steps are being followed in operating the pump as demonstrated by systems superintendent.

b. Effective and Well-Maintained Water Intake System - i.e. equipment and structures are servicing their respective functions:

- pump
- piping accessories (suction pipe, discharge pipe, elbows, foot valve, nipple)
- Pumpsite structures (pump foundation, motor/ engine foundation, motor shed, stilling pool and pipe supports)

(1) water delivered corresponds to and not lower than the pump's rated capacity.

(2) sump is kept clean.

(3) river banks protected from scouring.

(4) overflowing of canals near pumpsite avoided.

(5) equipment well cleaned and protected.

(6) inspection shows that preventive maintenance procedures for engine/motor are being practiced (specifically pertaining to lubrication, fuel, cooling system, electrical system, intake and exhaust system).

c. Effective Distribution and Conveyance System

- canals (main, lateral, ditches)
- canal structures (headgates, checkgates, turnouts, etc

(1) Distribution and delivery of adequate water can be controlled with the use of water controlling devices.

(2) Minimal drainage problems by establishing drainage canals and facilities between rotation areas.

(3) Minimal conveyance/distribution water losses.

(4) System is kept clean.

(5) Holes and seepage leaks if any are repaired.

(6) Permeable sections, if any, are lined.

FINANCIAL COMPONENT

Indicators of a Financially Stable ISA

1. Accounts receivable for the period have been fully paid to the ISA such as:

a. membership fees

b. irrigation fees due

c. semestral fees due

d. contributions/donations

e. fines and penalty

2. Accounts payable for the period have been fully paid by IS

a. registration fee

b. loan contract

c. water rights fee

d. operational expenses - fuel, gas, oil. electric current bill

e. repair and maintenance expenses

f. salaries and wages

g. rentals

h. miscellaneous expenses

3. Prescribed amount of loan amortization have been promptly and fully paid using funds from collected irrigation fees.

4. ISA Savings.

MALACANANG
Manila

PRESIDENTIAL DECREE NO. 681

CREATING THE "FARM SYSTEMS DEVELOPMENT CORPORATION" PRESCRIBING ITS POWERS AND ACTIVITIES PROVIDING FUNDS THEREFOR AND FOR OTHER PURPOSES

WHEREAS, it is the desired goal of the government to hasten rural development and to provide substantial opportunities to Filipino farmers to attain economic well-being and lead a dignified life;

WHEREAS, in the pursuit of this desire, the government shall pool the collective efforts of the public and private sectors in order to effect the necessary changes and reforms in the social, economic and political structures of our society;

WHEREAS, there is an imperative need to increase food production in order to cope with the demand by an expanding population;

WHEREAS, the government is cognizant of the role the farmers play in the process of modernizing the agricultural sector;

NOW, THEREFORE, I, FERDINAND E. MARCOS, President of the Republic of the Philippines, by virtue of the powers vested in me by the Constitution, do hereby decree, order and make as part of the law of the land the following:

Chapter I

Title, Purpose and Definitions

Section 1. TITLE. - This Decree shall be referred to as the "FARM SYSTEMS DEVELOPMENT CORPORATION DECREE".

Section 2. POLICY/PURPOSE. - The commitment of the farmers to participate in the efforts to improve farming, processing and marketing methods is vital in the process of increasing food production and hastening rural development. It is hereby declared to be the policy of the State to pursue and foster in an orderly and expeditious manner, the attainment of this objective.

For this purpose, the FSDC shall promote the organization of and assist all irrigation associations and other farm-based related entities which are willing to pursue diligently the above purpose.

To become effectively established and operationally stable, the irrigation associations, and other farm-related entities shall be given every tenable support and assistance by the national government, its instrumentalities and agencies to the fullest extent of which they are capable. Being by their nature substantially self-regulating and Congress having by the enactment of this Decree, they should be subject to minimal regulations by other administrative agencies in all phases of their organization and operation requiring and justifying regulation, in order to further encourage and promote their development.

Section 3. DEFINITIONS - As used in this Decree, the following words or terms shall have the following meaning, unless a different meaning clearly appears from the context:

a) "FSDC" shall mean the Farm Systems Development Corporation, "Board of Administrators" shall mean the Board of Administrators and "Administrator" shall mean the Administrator, all as provided for in this Decree.

b) "Corporation" shall mean the FSDC.

c) "NIA" shall mean the National Irrigation Administration, "NEA" shall mean the National Electrification Administration, "DAP" shall mean the Development Academy of the Philippines, "NPC" shall mean the National Power Corporation, and "NGA" shall mean the National Grains Authority.

d) "Association" shall mean a corporation organized or existing under Act No. 1459, or a corporation thereafter organized, that manages, runs and provide water for irrigation purposes, and other concomitant services.

e) "Person" shall mean any natural person, firm, association, corporation, business trust, partnership, the National Government, or any political subdivision, agency or instrumentality thereof.

f) "Service" shall mean irrigation service including the providing of any auxiliary or related service.

g) "Area" shall mean: (1) the geographic area covered or serviced by an irrigation association, or (2) any lesser geographic area for the furnishing of irrigation service for which an association, person, or any entity pursuant to this Decree, borrows, or may apply to borrow, funds from FSDC, or may secure loans with the approval of the FSDC, to finance the acquisition or construction and operation, maintenance of irrigation and farm-related facilities.

h) "Interest rate per centum per annum" shall mean an interest rate that is accrued solely upon the unpaid balance of any principal loan which has actually been advanced to a borrower and upon any interest payment which has become due or been paid by the borrowers, computed on an annual basis.

i) "Loan" shall mean a loan, the total principal amount of which, as when required for application to the purpose thereof, is at the time of the making thereof, assured from funds that are or will become available therefor.

j) "Congress" shall mean the President during his exercise of Martial Law, or the National Assembly under the new Constitution, whichever is the case at any given time.

k) "President" shall mean the President of the Philippines during the existence of Martial Law, or the Prime Minister when the National Assembly comes into existence.

Chapter II

The Farm Systems Development Corporation

Section 4. FSDC AUTHORITIES, POWERS AND DIRECTIVES. - The FSDC is hereby authorized, empowered and directed to promote the organization of, and assist farmer-associations particularly irrigation associations to the end of achieving the objectives of hastening rural development, and for such purpose it is hereby, without limiting the generality of the foregoing and in addition to their authorization, powers and directives established by this Decree, specifically authorized, empowered and directed:

a) to have a continuous succession under its corporate name until otherwise provided by law;

b) to prescribe and thereafter to amend and repeal its By-Laws not inconsistent with this Decree;

c) to adopt and use a seal and alter it at its pleasure;

d) to sue and be sued;

e) to make contract of every name and nature and to execute all instruments necessary or convenient for the carrying on of its business;

f) to make loans to irrigation or related associations for the construction or acquisition, operation and maintenance of irrigation systems and all related farm properties such as equipment, machinery, fixtures and materials. And thereafter, to make loans for the restoration, improvement or enlargement of such facilities;

g) to assist irrigation-based associations and coordinate with government agencies and corporations having related functions and purposes in planning, developing, establishing, operating, maintaining, repairing and renovating association's facilities and systems;

h) to prepare feasibility studies, engineering plans for integrating farm-based systems development including the procurement of modern and improved facilities, devices and accessory equipment;

i) to provide managerial or administrative expertise including the rendering of professional training services for association's staff and employee development;

j) to cooperate, coordinate and exchange such information, studies and reports with and to seek such cooperation and coordination from other departments, agencies and instrumentalities of the National Government including the National Irrigation Administration (NIA), the National Grains Authority (NGA), the National Electrification Administration (NEA), the Development Academy of the Philippines (DAP), and the National Power Corporation (NPC), as will most effectively conduce to the achievement of the purposes of this Decree;

k) to borrow funds from any source, private or government, foreign or domestic, and to issue bonds or other evidence of indebtedness;

l) to appoint, through its Board of Administrators, such officers and employees as are not otherwise provided in this Decree, to define their duties, fix their compensation, and require bonds of them;

m) to acquire, by purchase or otherwise, real and personal properties as may be required, advisable or desirable for the proper conduct of its business;

n) to prescribe rules and regulations in which its general business may be conducted as well as to fix and implement terms and conditions of loans for irrigation and related activities;

o) to establish branch offices;

p) to invest its funds or other assets in such undertaking as it may deem wise or necessary to carry out its purposes and objectives;

q) to report to the President at least annually, not later than June 30, and when the same comes into existence, the Prime Minister and the National Assembly on the status of its operation in the Philippines including a comprehensive reporting of loans made advanced loans secured from other sources and the advance thereof, the names and locations of the borrowers, the number of farmers receiving service as a result of such loans;

r) to do and perform any other acts and things, and to have and exercise any other powers which may be necessary, incidental or appropriate to accomplish the purpose for which the FSDC is organized.

Section 5. FSDC BOARD OF ADMINISTRATORS, ADMINISTRATOR. -

a) For the purpose of administering the provisions of this Decree, there is hereby established a public corporation, to be known as the FARM SYSTEMS DEVELOPMENT CORPORATION. All the powers of the corporation shall be vested in and exercised by a Board of Administrators, which shall be composed of: the Executive Secretary; the NIA Administrator, the NEA Administrator, the NGA Administrator, the DAP President the NPC General Manager as regular members and the Administrator as ex-officio member, and that the term of the ex-officio member shall be co-terminous with his term as the Administrator. The Chairman shall be appointed by the President from among the regular members. The Chairman and every member of the Board of Administrators shall be entitled to a per diem of not more than ₱300.00

for such meeting actually attended by them. Provided that the total of such per diems shall not exceed one thousand five hundred pesos (₱1, 500.00) per month per member.

b) The Board of Administrators shall meet regularly at least twice a month and as often as the exigencies of Corporation's affairs demand. The presence of at least four members shall constitute a quorum which shall be necessary for the transaction of any business. The affirmative votes of a majority of the members present shall be necessary for the approval of any resolution, decision or order, except when a greater number of votes is required as sometimes hereinafter provided. When the Chairman is absent at a meeting duly called, the Administrator as ex-officio member shall preside.

c) The Board shall, without limiting the generality of the foregoing, have the following specific powers and functions:

1) to implement the provisions and purposes of this Decree;

2) to formulate and adopt policies and plan, and to promulgate rules and regulations for the management, operation and conduct of the affairs and business of the FSDC;

3) to raise and/or borrow the necessary funds from local and international financing sources or institutions and to secure the same by any guarantee, pledge, mortgage, deed or trust, or assignment of the property of the Corporation for the purpose of financing the programs and projects deemed vital for the attainment of its goals and objectives;

4) to enter into, make and execute contracts of any kind or nature as may be necessary or incidental to the accomplishment of its purposes and, generally, to exercise all the powers necessary to achieve the corporation's purposes and objectives;

5) to prescribe terms and conditions in the loan agreement and other related contracts that the borrower's rates, charges, rules and regulations, policies, and all other terms and conditions affecting its extension and furnishing of service shall be such as to assure achievement of the loan purposes, and that the same shall be filed

with and for such purpose approved by the Board of Administrators before being put into effect or changed by the borrower;

6) to approve the budget of the corporation and to appoint and fix the salaries of such executive officers and other officials of the corporation as may be necessary for the accomplishment of its corporate purposes;

7) to establish policies and guidelines for employment on the basis of merit, technical competence, and moral character, and upon the recommendation of the Administrator to organize or re-organize FSDC's staffing pattern and personnel and to define their powers and duties.

8) to establish and maintain such reasonable employee and executive benefit plans (including life, accident, or special individual insurance policies) as the exigencies or resources of the Corporation shall permit and its Board of Administrators shall authorize

d) The management of the FSDC shall be vested in the Administrator who shall be a person of known integrity, competence in technical and executive fields related to the purposes of this Decree. He shall be appointed by the President of the Philippines and shall not be removed except for cause.

The Administrator shall have the following powers and

1) to execute and administer the policies, plans and programs and the rules and regulations, approved or promulgated by the Board of Administrators;

2) to submit for the consideration of the Board of Administrators such policies, plans and programs as he deems necessary to carry out the provisions and purposes of this Decree;

3) to direct and supervise the operations and internal administration of the FSDC and, for this purpose, to delegate some or any of his powers and duties to subordinate officials of the Corporation;

4) to appoint and fix the number and compensation of subordinate officials and employees of the FSDC, including appointments on a part-time basis; notwithstanding Section 259 of the Revised Administrative Code.

Provided, however, the provisions of the Civil Service Law and the Wage and Position Classification Laws shall not apply to the appointment and compensation of any such subordinate officials and employees;

5) for cause, to remove, suspend, or otherwise, discipline any subordinate official or employee;

6) to prepare an annual report on the activities of the FSDC at the close of each fiscal year and to submit a copy thereof to the President of the Philippines and when it comes into existence, the Prime Minister and the appropriate committee of, and as determined by the National Assembly; and

7) to exercise such other powers and duties as may be vested in him by the Board of Administrators.

In case of absence or disability of the Administrator, he shall designate any of the Directors who shall act in his place.

Section 6. POWER TO ISSUE BONDS. - Whenever the Board of Administrators may deem it necessary for the corporation incur any indebtedness or to issue bonds to carry out the provisions of this Decree, it shall, by resolution, so declare and state the purpose for which the proposed debt is to be incurred. The resolution shall be confirmed by the affirmative vote of at least four (4) members of the Board and approved by the President of the Philippines.

Section 7. SINKING FUND. - A sinking fund shall be established in such manner that the total annual contribution thereto accrued at such rate of interest as may be determined by the Board of Administrators, shall be sufficient to redeem at maturity the bonds issued under this Decree.

Such fund shall be under the custody of the Treasury of the FSDC which shall invest the same in such manner as the Board of Administrators may direct; charge all expenses of investment to said sinking fund, and credit the same with the interest on investment and other income belonging to it.

Section 8. GUARANTEE BY THE GOVERNMENT. - The Republic of the Philippines hereby guarantees the payment by the FSDC of both principal and the interest of the bonds debentures, collaterals, notes or such other obligations issued by the FSDC by virtue of this Decree, and shall pay such principal and interest in the event that the Corporation fails to do so. In case the Corporation shall be unable to pay the said principal and interest, the Secretary of Finance shall pay the amount thereof which is hereby appropriated out of any funds in the National Treasury not otherwise appropriated and thereupon, to the extent of the amounts so paid, the Government of the Republic of the Philippines shall succeed to all the rights of the holders of such bonds, debentures. collaterals, note or other obligations, unless the sum so paid by the Republic of the Philippines shall be refunded by the Corporation within a reasonable time.

Section 9. COMMISSIONER ON AUDIT. - The Commissioner on Audit shall be the ex-officio auditor of the FSDC, and to give autonomy to the governing board of the FSDC in the management and operation of the corporation, the provisions of Section 584 of the Revised Administrative Code, as amended by Republic Act Nos. 2266 and 2716 as further amended by Presidential Decree No. 61, shall apply to the Office of the Representative of the Commissioner on Audit.

Section 10. CAPITAL STOCK. - The authorized Capital Stock of the FARM SYSTEMS DEVELOPMENT CORPORATION is eight hundred million pesos divided into eight million shares of no par value, which shares are not to be transferred, negotiated, pledged, mortgaged or otherwise given as security for the payment of any obligation. The sum of fifty million pesos (₱50 M) of the capital stock shall be subscribed and paid wholly by the Government of the Philippines which amount is hereby appropriated and programmed immediately for FY 1976.

The remaining seven hundred fifty million pesos shall be wholly subscribed by the Government of the Philippines and shall be appropriated, programmed, and paid as follows:

a) the sum of fifty-five million pesos (₱55 M) for the FY 1976-1977.

b) the sum of seventy-two million pesos (₱72 M) for the FY 1977-1978 and FY 1978-1979.

c) the sum of sixty-sven million pesos (₱67 M) for each succeeding fiscal year until fiscal year 1985-1986.

d) and such sums as may be appropriated, programmed, and/or allocated by the President or the National Assembly when it comes to existence from time to time as the financial needs of the FSDC so requires and until the authorized capital is fully paid up.

Section 7. FOREIGN LOANS. - The Corporation is hereby authorized to contract loans, credits, any convertible foreign currency or capital goods, and indebtedness from time to time from foreign governments, or any international financial institutions or fund sources or to issue bonds, the total outstanding amount of which exclusive of interests, shall not exceed TWO HUNDRED FIFTY MILLION UNITED STATES DOLLARS or the equivalent thereof in other currencies, on such terms and conditions as it shall deem appropriate for the accomplishment of its purposes and to enter into and execute agreements and other documents specifying such terms and conditions.

The President of the Philippines, by himself, or through his duly authorized representative, is hereby authorized to negotiate and contract with foreign governments or any international financial institutions or fund sources, in the name and in behalf of the Corporation, one of several loans, for the accomplishment of its purposes.

The President of the Philippines, by himself, or through his duly authorized representative, is hereby further authorized to guarantee, absolutely and unconditionally, as primary obligor and not as surety merely in the name and in behalf of the Republic of the Philippines, the payment of the loans, credits, indebtedness and bonds issued over and above the amount of which the President of the Philippines is authorized to guarantee under Republic Act numbered sixty one hundred forty two, as amended, as well as the performance of all or any of the obligations undertaken by the corporation in the territory of the Republic of the Philippines pursuant to loan agreements entered into with foreign governments or any international financial institutions or fund sources.

The loans, credits and indebtedness contracted under this subsection and the payment of the principal, interest and other charges thereon, as well as the importation of machinery, equipment, materials, supplies and services, by the Corporation. Paid from the proceeds of any loans, credit or indebtedness incurred under this Act, shall also be exempt from all direct and indirect taxes, fees, imports, other charges and restrictions, including import restrictions previously and presently imposed, and to be imposed by the Republic of the Philippines, or any of its agencies and political subdivisions.

Section 12. ENFORCEMENT POWERS - If any association which has borrowed funds from FSDC, or from any other lender with FSDC's lawfully required prior approval, shall default in its principal or interest payment, or shall fail, after notice from the FSDC to comply with any other term or condition of loan agreement or of any rule or regulation promulgated by the FSDC in administering the provision of this Decree, the Board of Administrators is hereby authorized and empowered in its direction to do any or any combination of the following:

a) Refuse to make or give any lawfully required approval to any new loan to the borrower;

b) Withhold without limitations the FSDC advancement, or withhold its approval for any other lender with respect to which the FSDC has such approving power to make advancement of funds pursuant to any loan already made to the borrower;

Withhold any technical or professional assistance otherwise being furnished or that might be furnished to the borrower;

d) Foreclose any mortgage or deed or trust or other security held by the FSDC on the properties of such borrower, in connection with which the FSDC may subject to any superior or co-equal rights in such lien held by any other lender, (1) bid for and purchase or otherwise acquire such properties, (2) pay the purchase price thereof and any cost and expenses incurred in connection therewith out of the revolving fund, (3) accept title to such properties in the name of the Republic of the Philippines, and (4) even prior to the institution of foreclosure proceedings, operate or lease such properties for such period, and in such manner as may be deemed necessary or advisable to protect the investment therein, including the improvement, maintenance and rehabilitation of facilities and systems to be foreclosed, but the FSDC shall, within five years after acquiring such properties in foreclosure proceedings sell the same for such consideration as it determines most conducive to the purposes of this Decree; or

e) Take any other remedial measure for which the loan agreement may provide.

In addition to the foregoing, the Board of Administrators, may at its own instance and in the name of the FSDC, petition any court having jurisdiction for such purpose or any administrative body possessing regulatory powers for such purpose (including the Board of Power and Waterworks and Securities and Exchange Commission) to issue such order and afford such lawful relief as may be necessary.

No borrower shall, without the approval of the Board of Administrators, and of any other lender holding or sharing a lien on such borrower's properties, sell or dispose of the properties, rights, franchises, permits or any other assets acquired and/or mortgaged pursuant to the provisions of this Decree until all outstanding indebtedness to the FSDC and any other such lender, including all interest owing thereon, shall have been repaid; Provided, however, the FSDC may by appropriate rule or regulation grant general permission to borrowers, to dispose of incidental properties (excluding real property), rights, franchises, permits or other assets no longer deemed necessary or useful in conducting the borrower's operations.

No association with outstanding loans with the FSDC shall borrow money from any source without the Board of Administrators' prior approval; provided, that the Board of Administrators may, by appropriate rule or regulation, grant general permission to such associations to secure short term loans not requiring the encumbering of their real properties or a substantial portion of other properties or assets.

Section 13. EXEMPTION FROM ALL TAXES, DUTIES, FEES, IMPOSTS AND OTHER CHARGES BY GOVERNMENT AND GOVERNMENT INSTRUMENTALITIES. The FSDC shall have all its returns from its capital investments as well as other revenues from its operation to attain its objectives. To enable the FSDC to pay its indebtedness and obligations and in furtherance and effective implementation of the policy enunciated in this Decree, the FSDC is hereby declared exempt for a period of ten years from the effectivity of this Decree from the payment of all taxes, duties, fees, imposts, charges, costs and restrictions of the Republic of the Philippines, its provinces, cities, municipalities and other government agencies and instrumentalities, including taxes, duties, fees, imposts and other charges provided for under the Tariff and Customs Code of the Philippines, R.A. No. 1937 as amended by Presidential Decree No. 34 dated November 27, 1972 and Presidential Decree No. 69 dated November 24, 1972, and filing and service fee and other charges or costs in any court of administrative proceedings in which it may be a party;

b) From all income taxes, franchise taxes and realty taxes to be paid to the National Government, its provinces, cities, municipalities, and other government agencies and instrumentalities;

c) From all import duties, compensating taxes and advance sales tax, wharfage fees on import of foreign goods required for its operations and projects; and

d) From all taxes, duties, fees, imposts and all other charges imposed directly or indirectly by the Republic of the Philippines, its provinces, cities, municipalities, on all petroleum and related products used by the FSDC.

Any provision of existing laws to the contrary notwithstanding, any donation, contribution, bequest, subsidy or financial aid which may be made to the Corporation shall be exempt from taxes of any kind, and shall constitute allowable deductions in full from the income of the donors or givers for income tax purposes.

Section 14. EXPENDITURES AND DISBURSEMENTS. - The expenditures and disbursements made by the Corporation in the conduct of its affairs shall not be subject to the procurement requirements and restrictions imposed by existing laws upon government agencies, instrumentalities and government-owned or controlled corporations.

Section 15. SUPERVISION. - The FSDC shall be under the direct supervision of the Office of the President for purposes of policy direction and coordination.

CHAPTER III

Transitory Provisions

Section 16. TRANSITORY PROVISION. - The properties, rights, assets, choses inaction, obligations, liabilities, records and contracts of the Barrio Irrigators' Service Association (BISA) Program, now under the joint sponsorship of NEA, NIA, PDAP, and DAP, shall be transferred to the Corporation.

Section 17. REPEALING CLAUSE. - All laws, executive orders, administrative rules and regulations inconsistent with the foregoing provisions are hereby repealed or accordingly modified.

Section 18. SEPARABILITY CLAUSE. - The provisions of this Decree are hereby declared separable, and if any provision of the Decree is held invalid or unconstitutional the remainder thereof shall not be affected.

Section 19. EFFECTIVITY. - This Decree shall take effect immediately.

Done in the City of Manila, this 4 th day of April in the year of our Lord, nineteen hundred and seventy five.

(SGD) FERDINAND E. MARCOS
President
Republic of the Philippines

By the President:

ALEJANDRO R. MELCHOR
Executive Secretary

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1975-1976

SUMMARY OF PROGRAM TARGETS

ACTIVITY	HECTARAGE	NO. OF ISAs	NO. OF FARMERS
Phase I			
1. Pump Irrigation Projects	20,500	205	10,250
2. Gravity Irrigation Projects	15,000	15	7,500
T O T A L	35,500	220	17,750
3. Organizational Activities (National System)	10,000	5	5,000
Phase II and III			
On-farm Services (Piloting)	10,585	110	5,292

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1975-1976

AREA COVERAGE

PUMP PROJECTS

	PROVINCE	Identified Potential for Pump Irrigation* (Hectares)		FSDC Target (Hectares)	
LUZON	Bulacan	27,000		2,000	
	Quezon	20,000		2,000	
	Bataan	7,000		2,000	
	Benguet	2,300	56,300	1,000	7,000
VISAYAS	Iloilo	12,000		3,000	
	Bohol	2,000		1,000	
	Antique	11,000		2,000	
	Aklan	700	25,700	500	6,500
MINDANAO	Zamboanga del Sur	6,000		2,000	
	Agusan del Sur	4,000		2,000	
	Davao Oriental	2,600		1,000	
	North Cotabato	11,000	23,600	2,000	7,000
	T O T A L		105,600		20,500

* Source: NIA

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1975-1976

AREA COVERAGE

GRAVITY IRRIGATION PROJECTS

	PROVINCE	Total Potential Identified for Gravity Systems (Hectares) *		FSDC Target (Hectares)	
LUZON	Isabela	130,000		2,000	
	Pangasinan	34,000	164,000	2,000	4,000
VISAYAS	Capiz	15,000		3,000	
	Iloilo	46,000		2,000	
	Antique	3,000		1,000	
	Aklan	35,000		1,000	
	Leyte	35,000	134,000	1,000	8,000
MINDANAO	Lanao del Sur	15,000	15,000	3,000	3,000
	T O T A L		313,000		15,000

ORGANIZATIONAL ACTIVITIES (NATIONAL SYSTEMS)

Coverage: 10,000 hectares
Target Areas to be negotiated with NIA.

* Source: NIA (1974)

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1975-1976

AREA COVERAGE

PILOT AREAS FOR PHASE 2 IMPLEMENTATION

	PROVINCE	HECTARAGE	
LUZON	Abra	1,800	
	Camarines Sur	1,100	
	Ilocos Norte	400	
	Isabela	1,100	
	La Union	1,100	
	Pampanga	2,500	8,000
VISAYAS	Capiz	1,015	
	Iloilo	220	
	Leyte	500	1,735
MINDANAO	Lanao del Sur	850	850
	T O T A L		10,585

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FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1976 - 1980

SUMMARY OF 5-YEAR PROGRAM TARGETS

ACTIVITY	HECTARAGE	NO. OF ISAs	NO. OF FARMERS
Phase I			
1. Pump Projects	170,500	1,705	85,250
2. Gravity Irrigation Projects	120,000	120	60,000
T O T A L	290,500	1,825	145,250
3. Organizational Activities (National Systems)	150,000	75	75,000
Phase II and III			
On-farm Services	230,000	1,535	115,000

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FIVE-YEAR PROGRAM TARGET HECTARAGE
(FISCAL YEAR 1976-1980)

Phase I

	FISCAL YEAR					
TYPE OF PROJECT	75-76	76-77	77-78	78-79	79-80	TOTAL
Pump Systems	20,500	30,000	35,000	40,000	45,000	170,500
Gravity Systems	15,000	20,000	25,000	30,000	30,000	120,000
TOTAL	35,500	50,000	60,000	70,000	75,000	290,500
National Systems (Organizational Activities)	10,000	20,000	30,000	40,000	50,000	150,000

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FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1976-1986

10-YEAR PROJECTTIONS: TOTAL HECTARES TO BE IRRIGATED

YEAR	FISCAL YEAR	PUMP SYSTEM	GRAVITY SYSTEM
0	1973 - 1975	30,000	-
1	1975 - 1976	20,500	15,000
2	1976 - 1977	30,000	20,000
3	1977 - 1978	35,000	25,000
4	1978 - 1979	40,000	30,000
5	1979 - 1980	45,000	30,000
6	1980 - 1981	55,000	55,000
7	1981 - 1982	65,000	60,000
8	1982 - 1983	75,000	70,000
9	1983 - 1984	80,000	70,000
10	1984 - 1985	80,000	75,000
	T O T A L	555,500	450,000
	GRAND TOTAL		1,020,500

TOTAL NO. OF ISAs ---------- 6,005

TOTAL NO. OF FARMERS ------- 510,250

FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FIVE-YEAR PROGRAM TARGET HECTARAGE
(FICAL YEAR 1976 - 1980)

Phase 2

TYPE OF PROJECT	FISCAL YEAR 75-76	76-77	77-78	78-79	79-80	TOTAL
Pump Systems	10,585	30,000	30,000	35,000	40,000	145,585
Gravity Systems	-	10,000	20,000	25,000	30,000	85,000
TOTAL	10,585	40,000	50,000	60,000	70,000	230,585

Phase 3

Pump Systems		10,000	30,000	30,000	35,000	105,000
Gravity Systems	-	-	10,000	20,000	25,000	55,000
TOTAL		10,000	40,000	50,000	60,000	160,000

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FARM SYSTEMS DEVELOPMENT CORPORATION
WORK PROGRAM
FISCAL YEAR 1976-1986

ESTIMATED POTENTIAL IRRIGABLE AREAS (HECTAI
AND FSDC 10-YEAR PROJECTIONS

TYPE OF PROJECT	ESTIMATED POTENTIAL* (HECTARES)	FSDC 10-YEAR TARGET (Has.)	% OF TOTAL POTENTIAL
Gravity	1,575,000	450,000	28.5
Pump (Surface)	555,500	555,500	100
Pump (Underground)	581,000	-	-
T O T A L	2,710,500	1,005,500	37%

* Source: NIA (1974)

THE FARM SYSTEMS DEVELOPMENT CORPORATION

SUMMARY OF STAFFING PATTERN

TOTAL

I.	OFFICE OF ADMINISTRATOR	29
	A. Office of the Administrator	5
	B. Operations Control Center	3
	C. Research and Project Evaluation Office	6
	D. Corporate Auditor's Office	5
	E. Corporate Planning Office	4
	F. Special Services Office	6
II.	PLANS AND PROGRAM DEPARTMENT	22
	A. Office of the Director	2
	B. Agricultural Projects Development Section	5
	C. Management and Organization Development Section	15
III.	FINANCE DEPARTMENT	16
	A. Office of the Director	2
	B. Financial Feasibility/Evaluation Section	5
	C. Financial Planning and Programming Section	4
	D. Financial/Loan Accounting Section	5

IV.	ENGINEERING DEPARTMENT	103
	A. Office of the Chief of Engineering Department	3
	B. Investigation/Survey Division	30
	C. Design and Construction Division	27
	D. Equipment and Procurement Division	43
V.	ADMINISTRATIVE DEPARTMENT	32
	A. Office of the Director	2
	B. Legal and Documentation Section	3
	C. Personnel and General Services Section	12
	D. Property Section	5
	E. General Accounting	7
	F. Cash Section	3
VI.	OPERATIONS DEPARTMENT	91
	A. Office of the Director	2
	B. Provincial Task Force	80
	C. Special Projects	9

THE FARM SYSTEMS DEVELOPMENT CORPORATION

STAFFING PATTERN

I. Office of the Administrator (5)

- 1 Administrator
- 1 Executive Assistant
- 1 Executive Secretary
- 2 Secretaries

A. Operations Control Center (3)

- 1 Operations Control Officer
- 1 System Analyst
- 1 Clerk-Typist

B. Research and Project Evaluation Office (6)

- 1 Research and Evaluation Officer
- 1 Statistician
- 1 Research Associate
- 2 Research Assistants
- 1 Clerk-Typist

C. Corporate Auditor's Office (5)

- 1 Auditor
- 1 Assistant Auditor
- 2 Auditing Clerks
- 1 Secretary

D. Corporate Planning Office (4)

1 Corporate Planning Officer

2 Project Officers

1 Clerk-Typist

E. Special Services Office (6)

1 Special Services Officer

2 Project Assistants

1 Artist

1 Photographer

1 Clerk-Typist

II. Plans and Program Department

A. Office of the Director (2)

1 Director

1 Secretary

B. Agricultural Project Development Section (5)

2 Project Officers

2 Project Assistants

1 Clerk-Typist

C. Management and Organization Development Section (15)

1 Training Officer

2 Training Associates

2 Project Assistants

4 Training Assistants

2 Training Aides

1 Artist

3 Clerk-Typists

III. Finance Department

A. Office of the Director (2)

1 Director

1 Secretary

B. Financial Feasibility/Evaluation Section (5)

1 Section Head

1 Financial Analyst

2 Project Assistants

1 Clerk-Typist

C. Financial Planning and Programming Section (4)

1 Section Head

2 Project Assistants

1 Clerk-Typist

D. Financial/Loan Accounting Section (5

1 Section Head

1 Accountant

1 Junior Accountant

1 Accounting Clerk

1 Clerk-Typist

IV. Engineering Department

A. Office of the Chief of Engineering Department (3)

1 Chief Engineer

1 Assistant Chief Engineer

1 Secretary

B. Investigation/Survey Division (5)

1 Division Head

1 Clerk-Typist

3 Draftsmen

Investigation and Survey Section (21)

1 Section Head

20 Field Engineers

Water Resources Section (4)

1 Section Head

3 Project Assistants

C. Design and Construction Division (6)

1 Division Head

1 Clerk-Typist

4 Draftsmen

Design Section (6)

1 Section Head

2 Design Engineers

3 Project Assistants

Construction Section (11)

1 Section Head

10 Construction Supervisors

Project Estimate Section (4)

1 Section Head

3 Engineering Assistants

Equipment and Procurement Division (2)

1 Division Head

1 Clerk-Typist

Procurement and Quality Control Section (5)

1 Section Head

1 Equipment Engineer

2 Canvassers

1 Clerk-Typist

Warehousing/Transport/Motor Pool Section (24)

1 Section Head

1 Clerk-Typist

1 Messenger

1 Warehouse Transport Supervisor

2 Warehouse Stock Clerks

2 Transport Assistants

3 Auto-Mechanics

8 Drivers

5 Utilitymen

Installation and Maintenance Section (12)

1 Section Head

1 Clerk-Typist

10 Mechanic/Electricians

V. Administrative Department

A. Office of the Director (2)

1 Director

1 Secretary

B. Legal and Documentation Section (3)

1 Legal Officer

1 Documentation Clerk

1 Clerk-Typist

C. Personnel and General Services Section (12)

1 Section Head

2 Personnel Clerks

2 Clerk-Typists

1 Messenger

6 Drivers

D. Property Section (5)

1 Section Head

1 Canvasser

2 Stock Clerks

1 Clerk-Typist

E. General Accounting Section (7)

1 Section Head

1 Budget Analyst

2 Bookkeepers

2 Accounting Clerks

1 Clerk-Typist

F. Cash Section (3)

1 Chief Cashier

1 Assistant Cashier

1 Clerk-Typist

Operations Department

A. Office of the Director (2)

1 Director

1 Secretary

B. Provincial Tasl

1 Project Officer

78 Project Assistants

1 Clerk-Typist

C. Special Projects (9)

2 Project Officers

6 Project Assistants

1 Clerk-Typist

FSDC PERSONNEL HIRING SCHEDULE

SUMMARY

	AUTHORIZED NUMBER OF PERSONNEL	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER
I. Office of the Administrator	29	27	2	-	-
II. Plans & Programs Department	22	17	5	-	-
III. Finance Department	16	14	2	-	-
IV. Engineering Department	103	95	8	-	-
V. Administrative Department	32	29	3	-	-
VI. Operations Department	91	87	2	2	-
T O T A L	293	269	22	2	-

FSDC PERSONNEL HIRING SCHEDULE

OFFICE/DEPARTMENT	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL
OFFICE OF THE ADMINISTRATOR	5	-	-	-	5
A. Operations Control Center	3	-	-	-	3
B. Research & Project Evaluation	5	1	-	-	6
C. Corporate Auditor's Office	5	-	-	-	5
D. Corporate Planning Office	4	-	-	-	4
E. Special Services Office	5	1	-	-	6
	27	2	-	-	29
PLANS & PROGRAM DEPARTMENT					
A. Office of the Director	2	-	-	-	2
B. Agricultural Project Development	5	-	-	-	5
C. Management & Organization Development	10	5	-	-	15
	17	5	-	-	22
FINANCE DEPARTMENT					
A. Office of the Director	2	-	-	-	2
B. Financial/Feasibility/ Evaluation	4	1	-	-	5
C. Financial Planning and Programming	3	1	-	-	4
D. Financial/Loan Accounting	5	-	-	-	5
	14	2	-	-	16

IV. ENGINEERING DEPARTMENT					
A. Office of the Chief Engineer	3	-	-	-	3
B. Investigation/Survey					
Office of Division Chief	4	1	-	-	5
Investigation and Survey Section	21	-	-	-	21
Water Resources Section	3	1	-	-	4
C. Design and Construction					
Office of the Division Chief	6	-	-	-	6
Design Section	6	-	-	-	6
Construction Section	11	-	-	-	11
Project Estimate Section	3	1	-	-	4
D. Equipment and Procurement					
Office of the Division Chief	2	-	-	-	2
Procurement and Quality Control	5	-	-	-	5
Warehousing/Transport/ Motor Pool	19	5	-	-	24
Installation and Maintenance	12	-	-	-	12
	95	8	-	-	103
V. ADMINISTRATIVE DEPARTMENT					
A. Office of the Director	2	-	-	-	2
B. Legal and Documentation	3	-	-	-	3
C. Personnel and General Services	11	1	-	-	12
D. Property Section	5	-	-	-	5
E. General Accounting	5	2	-	-	7
F. Cash Section	3	-	-	-	3

VI. OPERATIONS DEPARTMENT

A. Office of the Director	2	-	-	-	2
B. Provincial Task Force	80	-	-	-	80
C. Special Projects	5	2	2	-	9
	87	2	2	-	91
T O T A L	269	22	2	-	293

FSDC PAY CLASSIFICATION

A. NON-SUPERVISORY POSITIONS

PAY CLASS	
1	Messenger, Utilityman
2	Clerk-Typist III
3	Clerk-Typist II
4	Photographer, Audio-Visual Technician, Reproduction Machine Operator
5	Canvasser, Driver
6	Documentation Clerk, Budget Assistant, Bookkeeper, Clerk-Typist I
7	Auto-Mechanic, Machinist, Welder
8	Forklift Operator, Secretary I, Draftsman
9	Warehouse Stock Clerk, Stock Clerk, Transport Assistant, Project Assistant IV, Research Assistant IV
10	Auditing Clerk, Personnel Assistant, Accounting Clerk
11	Artist, Laboratory Assistant, Training Aide, Buyers, Security Officer, Project Assistant III, Research Assistant III
12	Assistant Accountant, Budget Analyst

PAY CLASS

Executive Assistant, Research Assistant II, Training Assistant, Field Engineers, Project Assistant II, Mechanic/Electrician

Executive Secretary, Assistant Cashier, Project Assistant I, Training Assistant I, Research Assistant I, Legal Assistant

FSDC PAY CLASSIFICATION

B. SUPERVISORY POSITIONS

PAY CLASS

21	Project Officer IV, Research Associate IV, Training Officer IV, Systems Analyst IV
22	Warehouse Officer, Motor Pool and Machine Shop Officer, Design Engineer III, Statistician
23	Assistant Auditors, Treasury Officer
24	Systems Analyst III, Procurement Officer, Equipment Engineer
25	Project Officer III, Research Associate III, Training Officer III, Design Engineer II, Chief Cashier, Section Head
26	Special Services Officer
27	Systems Analyst II, Project Officer II, Training Officer II, Research Associate II
28	Systems Analyst I, Division Chief, Project Officer I, Training Officer I, Research Associate I, Legal Officer
29	Assistant Chief Engineer, Operations Control Officer

PAY CLASS	
30	Corporate Planning Officer, Research and Project Evaluation Officer
31	Department Head
32	
33	Corporate Auditor
34	Administrator

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FARM SYSTEMS DEVELOPMENT CORPORATION
PAY PLAN SUPERVISORY POSITIONS

*BASIC PAY

PAY CLASS	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
21	₱ 797.00	₱817.00	₱ 837.00	₱ 857.00	₱ 877.00
22	905.00	935.00	965.00	995.00	1,025.00
23	970.00	1,010.00	1,050.00	1,090.00	1,130.00
24	1,058.00	1,098.00	1,138.00	1,178.00	1,228.00
25	1,116.00	1,166.00	1,216.00	1,266.00	1,316.00
26	1,250.00	1,300.00	1,350.00	1,400.00	1,450.00
27	1,347.00	1,407.00	1,467.00	1,527.00	1,587.00
28	1,486.00	1,546.00	1,606.00	1,666.00	1,726.00
29	1,630.00	1,700.00	1,770.00	1,840.00	1,910.00
30	1,917.00	1,997.00	2,077.00	2,157.00	2,237.00
31	2,077.00	2,157.00	2,237.00	2,317.00	2,397.00
32	2,531.00	2,706.00	2,881.00	3,056.00	3,231.00
33	2,908.00	3,183.00	3,458.00	3,733.00	4,008.00
34	3,500.00	3,775.00	4,050.00	4,325.00	4,600.00

* BASIC PAY PLUS LIVING ALLOWANCE (30%) of BASIC) - GROSS

FARM SYSTEMS DEVELOPMENT CORPORATION
PAY PLAN FOR NON-SUPERVISORY POSITIONS

*BASIC PAY

PAY CLASS	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
1	₱ 240.00	₱ 250.00	₱ 260.00	₱ 270.00	₱ 280.00
2	280.00	290.00	300.00	310.00	320.00
3	320.00	330.00	340.00	350.00	360.00
4	350.00	362.50	375.00	387.50	400.00
5	375.00	387.50	400.00	412.50	425.00
6	400.00	412.50	425.00	437.50	450.00
7	425.00	437.50	450.00	462.50	480.00
8	450.00	465.00	480.00	495.00	510.00
9	480.00	495.00	510.00	525.00	540.00
10	540.00	555.00	570.00	585.00	600.00
11	600.00	620.00	640.00	660.00	680.00
12	640.00	660.00	680.00	700.00	720.00
13	680.00	700.00	720.00	740.00	780.00
14	720.00	740.00	780.00	800.00	820.00

*BASIC PAY PLUS LIVING ALLOWANCE (25% of BASIC) - GROSS

FARM SYSTEMS DEVELOPMENT CORPORATION
OPERATING BUDGET
FOR THE FISCAL YEAR ENDED 1979-1980

	1975-76	1976-77	1977-78	1978-79	1979-80
Personal Services	P3,529,750.00	P4,412,000.00	P 5,294,000.00	P 6,088,000.00	P 6,697,000.00
Supplies and Materials	354,650.00	443,000.00	532,000.00	612,000.00	673,000.00
Contracted/External Services	1,466,600.00	1,833,000.00	2,199,000.00	2,529,000.00	2,782,000.00
Travel and Transportation	860,400.00	1,076,000.00	1,291,000.00	1,485,000.00	1,633,000.00
Workshop & Staff Development	321,800.00	402,000.00	482,000.00	554,000.00	609,000.00
Special Projects	200,000.00	250,000.00	300,000.00	345,000.00	380,000.00
Miscellaneous	200,000.00	250,000.00	300,000.00	345,000.00	380,000.00
T O T A L	P6,933,200.00	P8,666,000.00	P10,393,000.00	P11,958,000.00	P13,154,000.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
QUARTERLY OPERATING BUDGET
FOR THE FISCAL YEAR 1975 to 1976

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	T o t a l
PERSONAL SERVICES	P 816,610.00	P 877,540.00	P 892,300.00	P 943,300.00	P3,529,750.00
SUPPLIES & MATERIALS	87,010.00	89,040.00	89,300.00	89,300.00	354,650.00
CONTRACTED/EXTERNAL SERVICES	390,800.00	358,600.00	358,600.00	358,600.00	1,466,600.00
TRAVEL & TRANSPORTATION	193,300.00	213,900.00	215,600.00	237,600.00	860,400.00
WORKSHOP & STAFF DEVELOPMENT	80,450.00	80,450.00	80,450.00	80,450.00	321,800.00
SPECIAL PROJECTS	50,000.00	50,000.00	50,000.00	50,000.00	200,000.00
MISCELLANEOUS	50,000.00	50,000.00	50,000.00	50,000.00	200,000.00
T O T A L	P1,668,170.00	P1,719,530.00	P1,736,250.00	P1,809,250.00	P6,933,200.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
OPERATING BUDGET
FOR THE FISCAL YEAR ENDED 1979 to 1980

		1975-1976	1976-1977	1977-1978	1978-1979	1979-1980
I	PERSONAL SERVICES					
	Salaries/Allowances	P2,896,000.00	P3,620.000.00	P4,344,000.00	P4,995,000.00	P5,495,000.00
	Consultants/Contractual Fee	199,500.00	249,000.00	299,000.00	344,000.00	378,000.00
	GSIS/medicare Premium	289,600.00	362,000.00	434,000.00	499,000.00	549,000.00
	Employee Benefits	144,650.00	181,000.00	217,000.00	250,000.00	275,000.00
	Sub-Total	P3,529,750.00	P4,412,000.00	P5,294,000.00	P6,088,000.00	P6,697,000.00
II	SUPPLIES & MATERIALS					
	Office Supplies & Materials	P 144,650.00	P 181,000.00	P 217,000.00	P 250,000.00	P 275,000.00
	Training Research & Info. Materials	160,000.00	200,000.00	240,000.00	276,000.00	304,000.00
	Printing and Publication	50,000.00	62,000.00	75,000.00	86,000.00	94,000.00
	Sub-Total	P 354,650.00	P 443,000.00	P 532,000.00	P 612,000.00	P 673,000.00
III	CONTRACTED/EXTERNAL SERVICES					
	Utilities	P 408,000.00	P 510,000.00	P 612,000.00	P 704,000.00	P 775,000.00
	External Relations	120,000.00	150,000.00	180,000.00	207,000.00	228,000.00
	Property Insurance Premium	34,200.00	43,000.00	51,000.00	59,000.00	65,000.00
	Security & Janitorial Services	100,800.00	126,000.00	151,000.00	174,000.00	191,000.00
	Communication Services	24,000.00	30,000.00	36,000.00	41,000.00	45,000.00
	Rental	720,000.00	900,000.00	1,080,000.00	1,242,000.00	1,366,000.00
	Maintenance-Office Furniture & Equipment	59,600.00	74,000.00	89,000.00	102,000.00	112,000.00
	Sub-Total	P1,466,600.00	P1,833,000.00	P2,199,000.00	P2,529,000.00	P2,782,000.00
IV	TRAVEL AND TRANSPORTATION					
	Travel	P 500,000.00	P 625,000.00	P 750,000.00	P 863,000.00	P 949,000.00
	Gas & Oil	300,000.00	375,000.00	450,000.00	517,000.00	569,000.00
	Maintenance-Transport Eqpt.	60,400.00	76,000.00	91,000.00	105,000.00	115,000.00
	Sub-Total	P 860,400.00	P1,076,000.00	P1,291,000.00	P1,485,000.00	P1,633,000.00
V	WORKSHOP & STAFF DEVELOPMENT	P 321,800.00	P 402,000.00	P 482,000.00	P 554,000.00	P 609,000.00
VI	SPECIAL PROJECTS	P 200,000.00	P 250,000.00	P 300,000.00	P 345,000.00	P 380,000.00
VII	MISCELLANEOUS	P 200,000.00	P 250,000.00	P 300,000.00	P 345,000.00	P 380,000.00
	GRAND TOTAL	P6,933,200.00	P8,666,000.00	P10,398,000.00	P11,958,000.00	P13,154,000.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
CAPITAL EXPENDITURE BUDGET
FOR THE FISCAL YEAR 1975-1976

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Percent	Total
Office Furniture/Equipment	P 408,500.00	P202,400.00	-	-	35 %	P 610,900.00
Engineering Equipment	198,200.00		-	-	11 %	198,200.00
Transport Equipment	499,271.00	112,816.00	P55,000.00	-	39 %	667,087.00
Leasehold Improvements	125,000.00	125,000.00	-	-	15 %	250,000.00
T O T A L	P1,230,971.00	P440,216.00	P55,000.00	-	100 %	P1,726,187.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
CAPITAL EXPENDITURE BUDGET - OFFICE FURNITURE & EQUIPMENT
FOR THE FISCAL YEAR 1975-1976

Equipment:	QUANTITY	ESTIMATED UNIT COST	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	TOTAL
Typewriters							
Electric	10	P 7,000.00	P 35,000.00	P 35,000.00	-	-	P 70,000.00
Manual	20	5,500.00	71,500.00	38,500.00	-	-	110,000.00
Calculators	25	4,000.00	100,000.00	-	-	-	100,000.00
Vault	1	25,000.00	25,000.00	-	-	-	25,000.00
Norelco Synchroplayer	1	14,000.00	-	14,000.00	-	-	14,000.00
Tape Recorders							
Reel	1	4,000.00	-	,000.00	-	-	4,000.00
Cassette	2	1,500.00	3,000.00	-	-	-	3,000.00
Overhead Projector	1	10,000.00	10,000.00	-	-	-	10,000.00
Projector Screen	3	1,000.00	3,000.00	-	-	-	3,000.00
Percolator	8	400.00	3,200.00	-	-	-	3,200.00
Audio Visual Aids	lot			55,000.00	-	-	55,000.00
Camera-Nikon plus extra lens	2	5,100.00	5,100.00	5,100.00	-	-	10,200.00
Furniture:							
Tables & Chairs	150	1,000.00	100,000.00	50,000.00	-	-	150,000.00
Secretarial Tables w/ Chairs	32	900.00	28,800.00	-	-	-	28,800.00
Typing Tables	16	250.00	4,000.00	-	-	-	4,000.00
Cardex	2	300.00	600.00	-	-	-	600.00
Storage Cabinet	2	800.00	800.00	800.00	-	--	1,600.00
Sofas	5	700.00	3,500.00	-	-	-	3,500.00
Filing Cabinet	50	300.00	15,000.00	-	-	-	15,000.00
T O T A L			408,500.00	P202,400.00			P610,900.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
CAPITAL EXPENDITURE BUDGET - ENGINEERING EQUIPMENT
FOR THE FISCAL YEAR - 1975-1976

	QUANTITY	ESTIMATED UNIT COST	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	TOTAL
Drafting Tables/Chairs	7	P1,500.00	P 10,500.00	-	-	-	P 10,500.00
Magnetic Compass	12	650.00	7,800.00	-	-	-	7,800.00
Hand Levels	20	300.00	6,000.00	-	-	-	6,000.00
5m Steel Tape	20	65.00	1,300.00	-	-	-	1,300.00
Transit	2	5,500.00	11,000.00	-	-	-	11,000.00
Levels	17	3,500.00	59,500.00	-	-	-	59,500.00
Stadia Rods	20	50.00	1,000.00	-	-	-	1,000.00
Level Rods	10	500.00	5,000.00	-	-	-	5,000.00
50-m Steel Tape	10	500.00	5,000.00	-	-	-	5,000.00
Drafting Pens	40	36.00	1,440.00	-	-	-	1,440.00
Set of Drafting Instruments	20	40.00	800.00	-	-	-	800.00
Calculators	6	2,500.00	15,000.00	-	-	-	15,000.00
Shovels	80	20.00	1,600.00	-	-	-	1,600.00
Set of Carpenter's Tools	45	500.00	22,500.00	-	-	-	22,500.00
Set of Mason's Tools	40	200.00	8,000.00	-	-	-	8,000.00
Set of Auto-Mechanic Tools	3	500.00	1,500.00	-	-	-	1,500.00
Grinder	1	500.00	500.00	-	-	-	500.00
Electric Welders	2	3,850.00	7,700.00	-	-	-	7,700.00
Set of Oxyacetylene torch w/ tank	2	1,880.00	3,760.00	-	-	-	3,760.00
Set of Electricians's Tools	9	1,800.00	16,200.00	-	-	-	16,200.00
Set of Mechanic's Tools	10	400.00	4,000.00	-	-	-	4,000.00
Fire Extinguisher 25"x20 lbs.	8	575.00	4,600.00	-	-	-	4,600.00
Wheel Mounted 50 lbs. (Fire-Extinguisher)	2	1,750.00	3,500.00	-	-	-	3,500.00
TOTAL			P198,200.00				P198,200.00

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FARM SYSTEMS DEVELOPMENT CORPORATION
CAPITAL EXPENDITURE BUDGET - TRANSPORT EQUIPMENT
FOR THE FISCAL YEAR 1975-1976

	QUANTITY	ESTIMATED UNIT COST	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	T O T A L
ENGINEERING REQUIREMENTS							
Jeeps	11	P 1,877.00*	P 20,647.00	P -	-	-	P 20,647.00
Jeep-Trailer	11	5,000.00	--	-	P55,000.00	-	55,000.00
3/4Ton Weapon Carrier Truck	12	2,816.00*	33,792.00	-	-	-	33,792.00
Trailer	1	277,000.00	277,000.00	-	-	-	277,000.00
5 Ton Tractor	2	7,508.00*	15,016.00	-	-	-	15,016.00
Fork Lifts	2	2,816.00*	2,816.00	2,816.00	-	-	5,632.00
SUB TOTAL			P349,271.00	P2,816.00	P55,000.00	-	P407,087.00
TRAINING REQUIREMENT							
Combi	1	60,000.00		60,000.00	-	-	60,000.00
RECONDITIONING EXPENSES			150,000.00	50,000.00	-	-	200,000.00
T O T A L			P499,271.00	P112,816.00	P55,000.00	-	P667,087.00

* - Price of excess property as quoted by NEA

MEMORANDUM

March 13, 1975

TO Mr. Alexander R. Love, EA/CC[illegible], A[illegible] W

FROM Richard M. Tangler, AD/CD, USAID, Philippines

SUBJECT Issues Raised by PRI Review Committee for Small Scale Irrigation Loan

REF STATE 046439

Based upon a more or less semi-intensive review of data available to the Mission on subject issues the following was condensed for submission to satisfy questions raised by item 3A and 3B in reftel.

A. Re Beneficiaries -- General classification for rice farmers shows 12 percent as owner-cultivators, 7 percent as part-owners, 44 percent as lessee and 37 percent as share tenants. Based on extrapolated data from government surveys the average household incomes for these tenure groups are estimated as 1/

Owner-cultivators/part-owners ---------- ₱4040

Lessees ---------- ₱3040

Share Tenants ---------- ₱2220

While the average income for landlords (small landlords less than 24 has.) is ₱4235 2/ given the norm of ₱100 per week requirement for maintaining the average household of 6 7 1/ persons at an acceptable subsistence level, it is seen that none of the above classes have opportunity to effect savings except the large landlords (over 24 has.).

Only one of the four province areas (Camarines Sur) selected for this project has detailed social survey data available. (This is available as a result of the USAID assisted Bicol River Basin Project.) In this area it is seen that the average weekly income of all rice farmer tenure groups combined (except landlords) is about ₱33 per week against a mean weekly subsistence requirement of ₱98. 3/ According to

1/ DAR Survey Report 1974
2/ USAID Study by Duncan Harkin 1975
3/ SSRU Research Report Series No. 6, May 1974

the Philippine 1975 Almanac, Camarines Sur is one of the most depressed areas of the Philippines with overall average family income (farmers and non-farmers) of ₱2,784 or ₱53.50 per week. For the other three areas the Almanac indicates Central Luzon where Quezon Province lies as ₱4,127, Northern Luzon where La Union Province is located ₱3,299 and Capiz Province of Panay Island is ₱3,206

Operation Land Transfer in a phased program is working on limiting landlord holdings of rice and corn land to 24 hectares in the 1st phase and eventually to 7 hectares. Therefore, the target beneficiaries for this project include some of all tenure groups engaged in rice farming

The PRP log frame targets an increase of 50% in unit yields and an increase in harvested crops to 2 per year resulting in a threefold increase overall. Given the average yield of 37 cavans of 50 kg. size per hectare the estimated attainable target is 111 cavans per hectare or 5.55 MT per hectare of palay at gross value of ₱5550 Assuming the average size farm for each tenure group is 2.2 hectares the gross farm production at one peso per kg. is ₱12,210.

Tenure Grouping	Gross Value				Increment	
	W/O Project		W/Project			
	Yield in Cavans	Value	Yield in Cavans	Value	₱	Percent Increase
Owner Cultivator/Part Owner	81	4050	243	12,150	8,100	200
Lessee @ 75% of crop	"	3040	"	"	6,075	200
Share Tenant @ 55% of crop	"	2220	"	"	4,455	200
Landlord at average income ₱4235	-	-	-	-	5,670	134

Partitioning the 2.2 hectare average size farm, owner cultivators and part owners which comprise 19% of the farm would realize ₱1550 or all of the 19% of ₱8100 production increment; lessees comprise 44% by tenure therefore .44 x .75 x 8100 = ₱2700, share tenants .37 x .55 x 8100 = 1650, and landlords .44 x .25 x 8100 + .37 x .45 x 8100 = ₱2240 Extrapolated over 5,000 hectares shows the beneficiaries gains as:

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(1) Owner/cultivators/part owners 945 ha. 5000 - 2.2 x 1550 = ₱ 3,530,000

(2) Lessees 2200 ha. x 2700 = ₱ 6,150,000

(3) Share Tenants 1855 ha x 1650 = ₱ 3,750,000

(4) Landlords 4055 ha. x 2240 = ₱ 4,920,000

Total Increment = ₱18,350,000

Commensurate with the land reform program is the continuing shift from tenant status to lessee and to amortizing owner cultivators. The small scale irrigation project is oriented toward institutionalizing a local farmer action program of development and improvement of the agricultural production base. The project supports the GOP's land reform program goal of shifting the tenurial pattern through providing the means for increasing the income levels of small farmers in low income areas. Since the targeted areas for land reform are rice and corn land and since the BISA program applies entirely to rice lands the small scale irrigation project encompasses the GOP's land reform target areas

B Re. New Projects vs. Rehab -- The BISA program, oriented as it is toward seeking a model for improving the productivity of agricultural land which puts the producer in the dominant role, has as one of its initial activities the installation of pumping sets and water distribution facilities for irrigation activities. Some of these installations will be in areas where previous pump sets were installed and later abandoned. However, these will rarely occur in identical area coverage, i.e., some may be smaller or larger, site location for diversion facilities and alignments for distribution may or may not be the same. Some of the installations will be in new areas. All will be in isolated areas not projected for inclusion under National Irrigation Project schemes. The real purpose is to institute a self-managed, self-governing organization to operate the system and to provide a business approach to achievement of other important group interests. The irrigation system as a major association owned capital investment serves as an important catalyst for inspiring other profitable undertakings. The BISA program does not differentiate between new areas and so-called rehab areas. It does require 100% membership and total commitment of the members as condition precedent to project implementation. This includes registration with the Securities Exchange Commission, favorable feasibility analysis as well as meeting all other requirements of the criteria screen

USAID believes the PRP review committee is comparing the proposed activities under this project to the IBRD agricultural sector analysis which includes recommendations for irrigation development in their Appendix 3. Attention is called to page 7 of Annex 3 IBRD sector analysis Item 22. The IBRD mission recommended

that the pumping program continue at a level of 1,000 to 1,200 pumps per year with possibility of faster expansion after perfecting a system for operation and maintenance USAID and BISA believe the Small Scale Irrigation Project Proposal now under preparation conforms to the general recommendations contained in the IBRD study.

We are proceeding with preparation of the PP and the issues raised in item 4 A thru K will be addressed in the paper.

We shall appreciate early advice of committee's satisfactory acceptance of this submission.

CD WJLeatham:mm

FARM SYSTEMS DEVELOPMENT CORPORATION
FINANCIAL PLAN
1975 - 1985

FARM SYSTEMS DEVELOPMENT CORPORATION
PROJECTED CASH FLOW STATEMENT
FOR THE PERIOD 1975-1980
(In Million Pesos)

	1975-76	1976-77	1977-78	1978-79	1979-80
INFLOWS					
Capitalization[1]	50.00	55.00	72.00	72.00	67.00
Principal Repayment[2]	2.00	10.87	27.15	48.00	72.62
Interest Income[2]	0.80	4.19	9.83	16.00	22.01
Investment Income[3]	0.50	1.25	1.68	2.25	2.59
Proceeds of Foreign Loan	-	35.00	17.00	10.00	8.00
Total Inflows	53.50	106.31	127.66	148.25	172.22
OUTFLOWS					
Operating Expenses[4]	6.93	6.67	10.40	11.96	13.15
Loans[2] - Irrigation Service	15.50*	50.00	60.00	70.00	75.00
On Farm Implements	8.85	31.42	44.25	53.00	61.95
Debt Service[5]	6.00	6.00	6.00	6.00	6.00
Interest Expense[5]	1.80	1.44	2.48	2.80	2.84
Capital Expenditures[6]	1.73	-	2.00	-	-
Total Outflows	40.81	97.53	125.13	143.86	158.94
BALANCES					
Beginning Balance		12.49	21.27	23.80	28.19
Net Inflow (Outflow)	12.49	8.78	2.53	4.39	13.28
Ending Balance	12.49	21.27	23.80	28.19	41.47

Actual amount loaned to borrower - P35.5M, P20M of which is in the form of irrigation pumps, engines and accessories acquired from NIA.

NOTES IN CASH FLOW PROJECTION

1. As per Presidential Decree No. 681 representing subscription and payment by the Government of the Philippines
2. Please see Schedule 2
3. Average cash balance is assumed to be invested in a fixed income security - assumed yield is 10%
4. Please see Schedule of Opening Budget
5. Please see Amortization Schedules for NIA and Foreign Loans Schedule 3
6. Please see Schedule of Capital Expenditures

FARM SYSTEMS DEVELOPMENT CORPORATION
PROJECTED INCOME STATEMENT
FOR THE FISCAL YEARS ENDED
1975-1980
(In Million Pesos)

	1975-76	1976-77	1977-78	1978-79	1979-80
REVENUES					
Interest Income	0.80	4.19	9.83	16.00	22.01
Investment Income	0.50	1.25	1.68	2.25	2.59
	1.30	5.44	11.51	18.25	24.60
EXPENSES					
Operating Expenses	6.93	8.67	10.40	11.96	13.15
Interest Expense	1.80	1.44	2.48	2.80	2.84
	8.73	10.11	12.88	14.76	15.99
Income From Operations	(7.43)	(4.67)	(1.37)	3.49	8.61

Exhibit III

FARM SYSTEMS DEVELOPMENT CORPORATION
PROJECTED BALANCE SHEET
AS OF FISCAL YEARS ENDING
1975-1980

	1975-76	1976-77	1977-78	1978-79	1979-80
ASSETS					
Cash	12.49	21.27	23.80	28.19	41.47
Loans Receivables	52.35	122.90	200.00	275.10	338.43
Fixed Assets*	1.73	1.73	3.73	3.73	3.73
Total	66.57	145.90	227.53	307.02	384.63
LIABILITIES					
NIA Loan	24.00	18.00	12.00	6.00	
Foreign Loan	-	35.00	52.00	62.00	70.00
Total	24.00	53.00	64.00	68.00	70.00
CAPITAL					
Paid-up	50.00	105.00	177.00	249.00	316.00
Retained Earnings	(7.43)	(12.10)	(13.47)	(9.98)	(1.37)
Total	42.57	92.90	163.53	239.02	314.63
LIABILITIES AND CAPITAL	66.57	145.90	227.53	307.02	384.63

* Reflected Gross of Depreciation

SCHEDULE I

FARM SYSTEMS DEVELOPMENT CORPORATION
PROGRAM COVERAGE
(IN HECTARES)
FOR THE PERIOD 1973-1980

LOANS GRANTED/YEAR	1973-75	1975-76	1976-77	1977-78	1978-79	1979-80
Irrigation Service Loans	10,000	35,500	50,000	60,000	70,000	75,000
On-Farm Implement Loans	-	10,000	35,000	50,000	60,000	70,000
T O T A L	10,000	45,500	85,000	110,000	130,000	145,000

LOAN REQUIREMENTS/HECTARE

1. Irrigation Loans — ₱1,000/hectare

2. On-Farm Implement Loans — ₱885/hectare

SCHEDULE 2

SCHEDULE OF LOAN RELEASES
REPAYMENT AND INTEREST INCOME
FOR THE PERIOD 1975-1980
(In Million Pesos)

	1973-75	1975-76	1976-77	1977-78	1978-79	1979-80
LOAN RELEASES						
Irrigation Service	P10.00	P35.50	P50.00	P 60.00	P 70.00	P 75.00
On-Farm Implements	-	8.85	31.42	44.25	53.10	61.95
TOTAL	P10.00	P44.35	P81.42	P104.25	P123.10	P136.95
LOAN REPAYMENTS						
1973-75		P 2.00	P 2.00	P 2.00	P 2.00	P 2.00
1975-76			8.87	8.87	8.87	8.87
1976-77				16.28	16.28	16.28
1977-78					20.85	20.85
1978-79						24.62
TOTAL		P 2.00	P10.87	P 27.15	P 48.00	P 72.62
NET LOANS	P10.00	P42.35	P70.55	P 77.10	P 75.10	P 64.33
LOANS OUTSTANDING	P10.00	P57.35	P122.90	P200.00	P275.10	P339.43
INTEREST INCOME		0.80	4.19	9.83	16.00	22.01

REPAYMENT PERIOD = 5 years
INTEREST RATE = 8 Percent/Annum

SCHEDULE 3

AMORTIZATION SCHEDULE
FOREIGN LOAN P70,000,000.00*

TERMS: 40 years 4% interest/annum

FISCAL YEAR	AMORTIZATION	INTEREST	PRINCIPAL	BALANCE
1976-77				P35,000,000.00
1977-78	P1,400,000.00	P1,400,000.00		52,000,000.00
1978-79	2,080,000.00	2,080,000.00		62,000,000.00
1979-80	2,480,000.00	2,480,000.00		70,000,000.00
1980-81	4,550,000.00	2,800,000.00	P1,750,000.00	68,250,000.00
1981-82	4,480,000.00	2,730,000.00	1,750,000.00	66,500,000.00
1982-83	4,410,000.00	2,660,000.00	1,750,000.00	64,750,000.00
1983-84	4,340,000.00	2,590,000.00	1,750,000.00	63,000,000.00
1984-85	4,270,000.00	2,520,000.00	1,750,000.00	61,250,000.00
1985-86	4,200,000.00	2,450,000.00	1,750,000.00	59,500,000.00

N I A LOAN P30,000,000.00

TERMS: 5 years 6% interest/annum

FISCAL YEAR	AMORTIZATION	INTEREST	PRINCIPAL	BALANCE
1974-75	-	-	-	P30,000,000.00
1975-76	P7,800,000.00	P1,800,000.00	P6,000,000.00	24,000,000.00
1976-77	7,440,000.00	1,440,000.00	6,000,000.00	18,000,000.00
1977-78	7,080,000.00	1,080,000.00	6,000,000.00	12,000,000.00
1978-79	6,720,000.00	720,000.00	6,000,000.00	6,000,000.00
1979-80	6,360,000.00	360,000.00	6,000,000.00	-

* Only first 10 years amortization exhibited